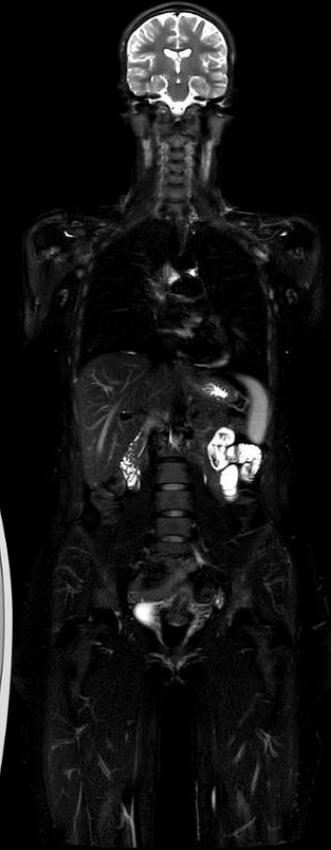


# MAGNETOM Sola with BioMatrix

Embrace human nature at 1.5T



# MAGNETOM Sola.

## Embrace human nature at 1.5T. With BioMatrix.

### New 1.5T Magnet

70 cm Open Bore,  
50 x 50 x 50 cm<sup>3</sup> FoV

### Gradient strength

XQ: 45 mT/m @ 200 T/m/s  
XJ: 33 mT/m @ 125 T/m/s

### Deep Resolve <sup>NEW</sup>

AI-powered advanced image  
reconstruction technology

### Accelerated applications

SMS and CS with Turbo Suite

### Efficient 1.5T operation

with Zero helium boil-off  
with EcoPower  
with power-saving technology



### BioMatrix Technology

New BioMatrix Sensors, Tuners,  
Interfaces

### Free-breathing exams

with Inline Compressed Sensing

### myExam 3D Camera<sup>1</sup> <sup>NEW</sup>

The world's first fully  
integrated 3D camera

### myExam Autopilot<sup>1</sup> <sup>NEW</sup>

MRI operation drastically  
simplified

### Ultra-high density coils

with Tim 4G & BioMatrix Technology

<sup>1</sup> The product is pending 510(k) clearance, and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# BioMatrix

## Embrace human nature



# BioMatrix Technology

## Driving consistency and efficiency in the face of biovariability



BioMatrix



**Anticipate** motion for high-quality results



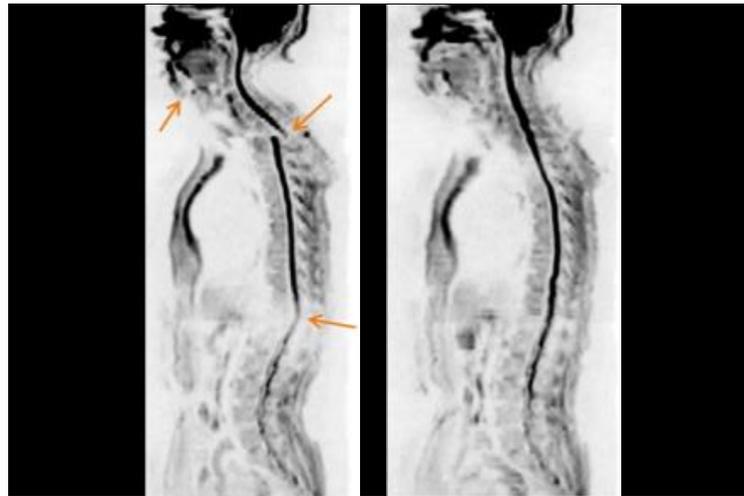
### BioMatrix Sensors

BioMatrix Respiratory Sensors

BioMatrix Beat Sensor<sup>1</sup>



**Adapt** to challenging anatomies for reliable exams



### BioMatrix Tuners

BioMatrix CoilShim

BioMatrix SliceAdjust



**Accelerate** patient preparation for increased efficiency



### BioMatrix Interfaces

BioMatrix Select&GO

BioMatrix Dockable Table with eDrive

<sup>1</sup> Cardiac Triggering for sequences other than Cardiac is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

Embrace human nature at 1.5T. With BioMatrix.

# The 1st BioMatrix 1.5T system

**MAGNETOM Sola**



# MAGNETOM Sola

## Embrace human nature at 1.5T with BioMatrix



### Embrace full 1.5T performance

with Tim 4G Coil portfolio and BioMatrix Technology

### Embrace true 1.5T productivity

with Deep Resolve, Turbo Suite and myExam Companion<sup>1</sup>

### Embrace new 1.5T clinical capabilities

with Inline Compressed Sensing

<sup>1</sup> myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# MAGNETOM Sola

## Embrace human nature at 1.5T with BioMatrix



### Embrace full 1.5T performance

with Tim 4G Coil portfolio and BioMatrix Technology

### Embrace true 1.5T productivity

with Deep Resolve, Turbo Suite and myExam Companion<sup>1</sup>

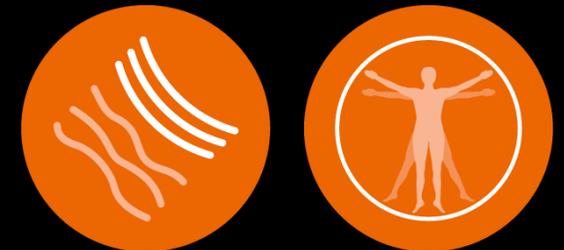
### Embrace new 1.5T clinical capabilities

with Inline Compressed Sensing

<sup>1</sup> myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

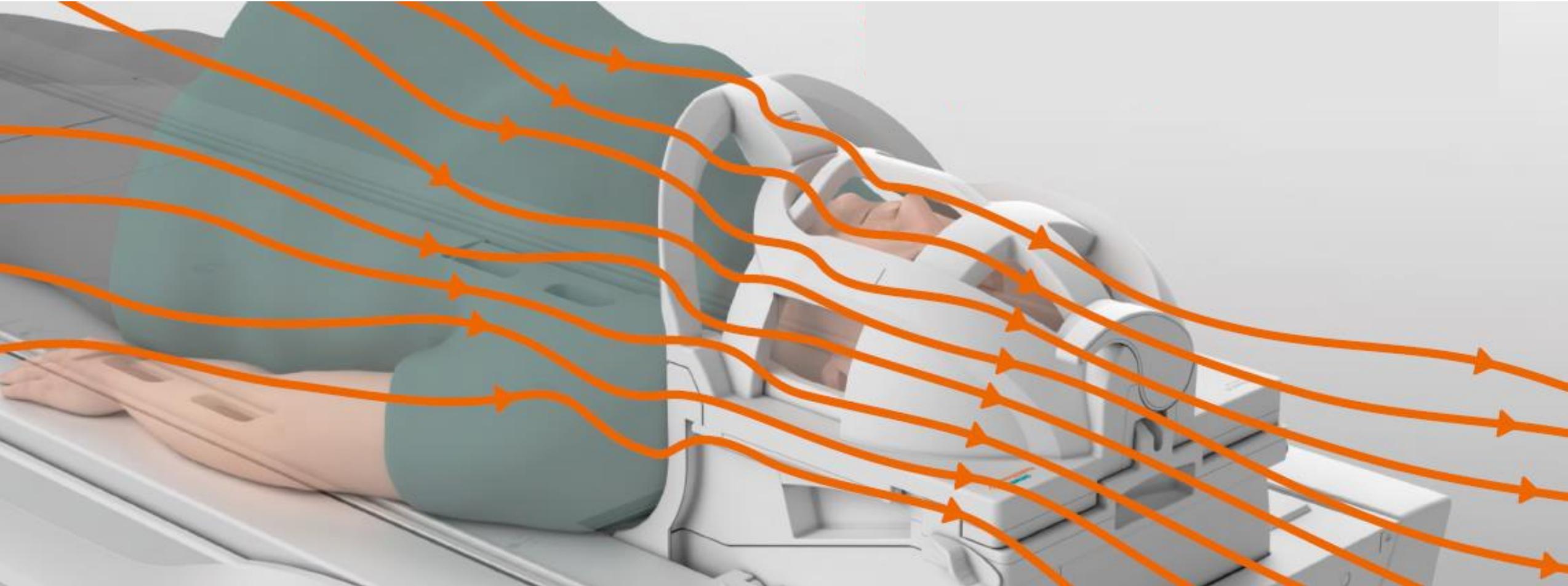
Adapt to challenging anatomies for reliable exams

# BioMatrix Tuners



# BioMatrix Tuners – CoilShim

Deeply embedded into the scanner architecture



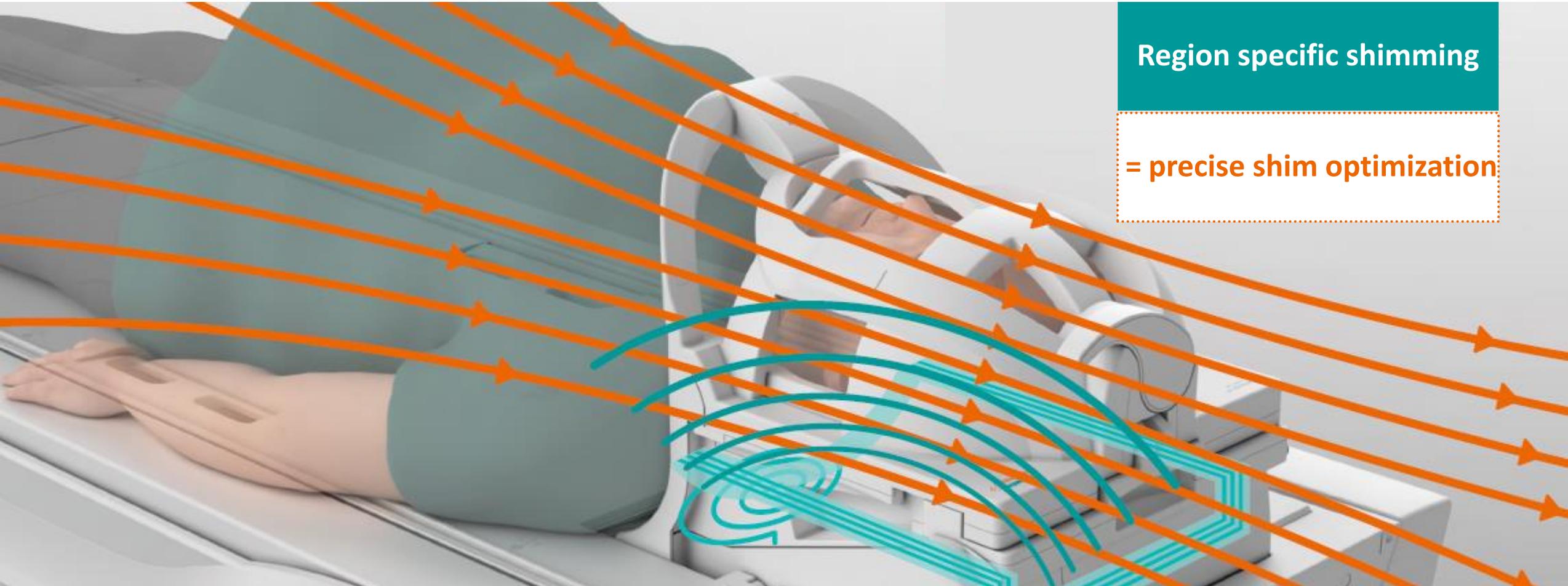
# BioMatrix Tuners – CoilShim

Deeply embedded into the scanner architecture



Region specific shimming

= precise shim optimization

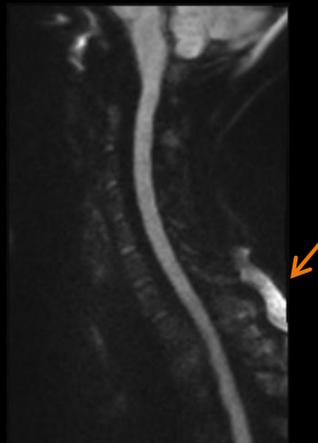
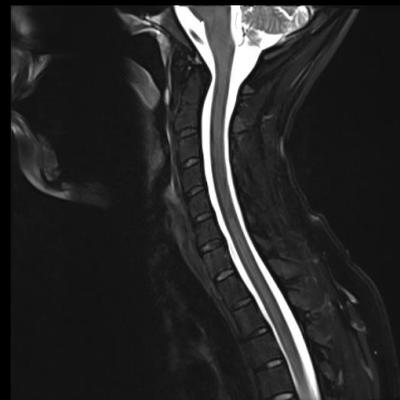


# Significantly improved fat saturation and image quality with BioMatrix Tuner CoilShim

Conventional



CoilShim



**Adapt to challenging anatomies  
with anatomy-specific  
local shimming**

**Improved fat saturation for  
Head/Neck imaging**

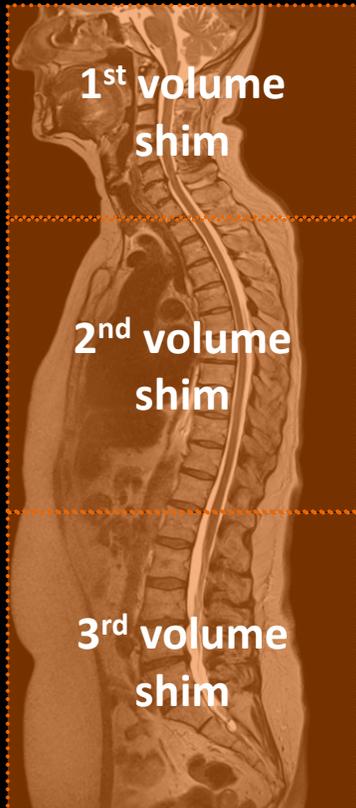
**Better DWI and TSE  
quality for Head/Neck  
imaging**

# BioMatrix Tuners: SliceAdjust

Adapt to challenging anatomies to increase consistency

Conventional volume adjust

SliceAdjust



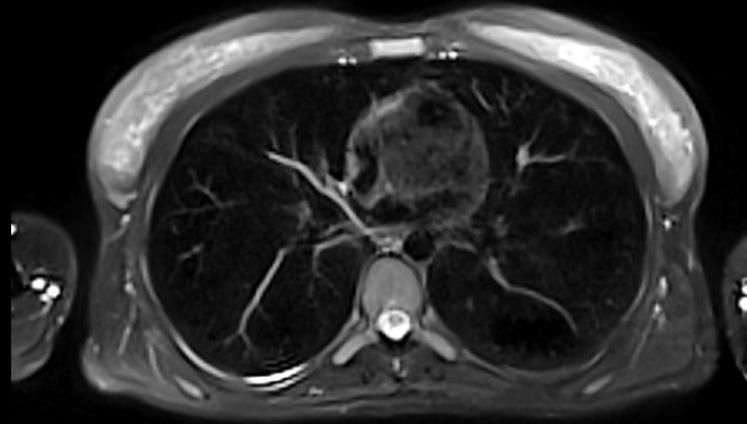
**No broken  
spine artifacts**

**Excellent  
correlation with  
anatomical scans**

# Improved image quality in the entire imaging volume with BioMatrix Tuner SliceAdjust

Conventional volume adjust

SliceAdjust

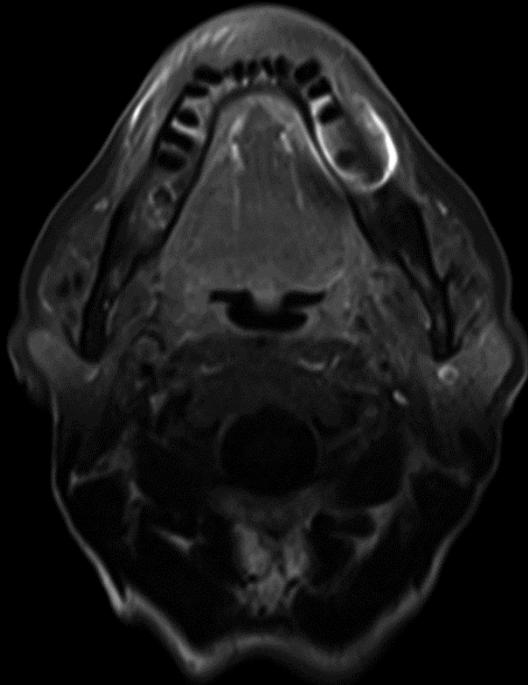


**SliceAdjust  
with TSE**

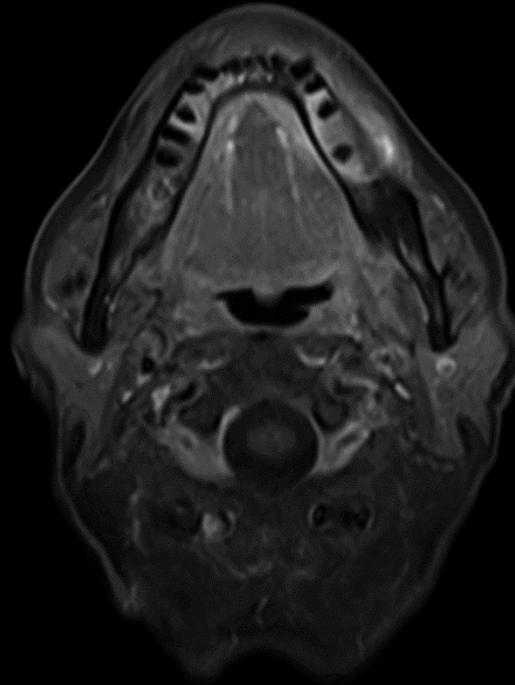
**For consistent results in  
the entire volume**

**Integrated in  
multi-concat TSE  
acquisitions**

# Improved homogeneity in the presence of implants with BioMatrix CoilShim



Conventional



with CoilShim

T1 TSE FatSat CE  
GRAPPA 2  
TA 1:52 min

Improved image quality despite a tooth implant!

Image artifacts are mitigated and susceptibility difficulties addressed over entire FoV

# BioMatrix Tuners

## Adapt to challenging anatomies for reliable exams

Conventional

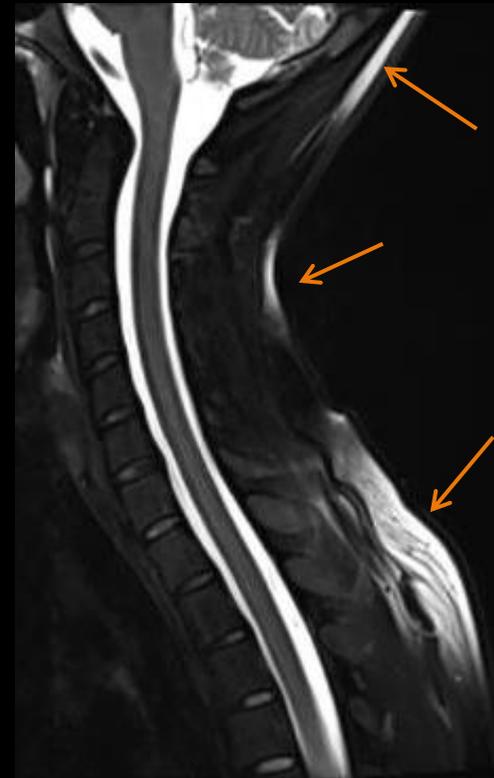


SliceAdjust

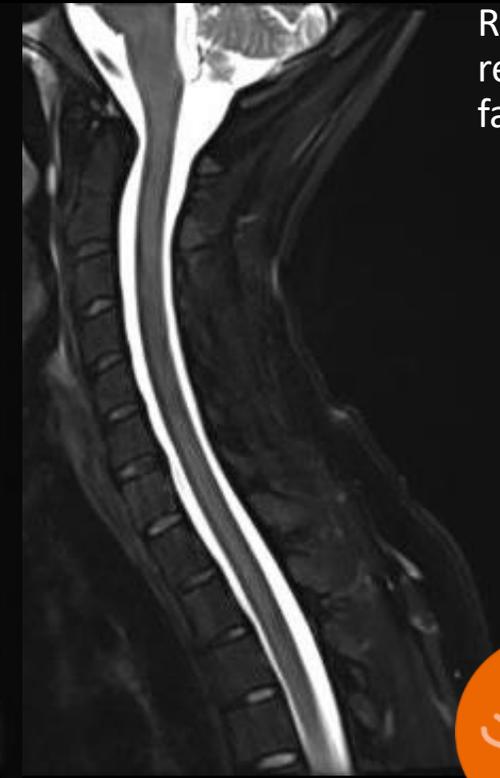


Mitigate broken spine artifacts

Conventional



CoilShim



Reduce residual fat signal



BioMatrix



# Our unique patient- centered coil portfolio

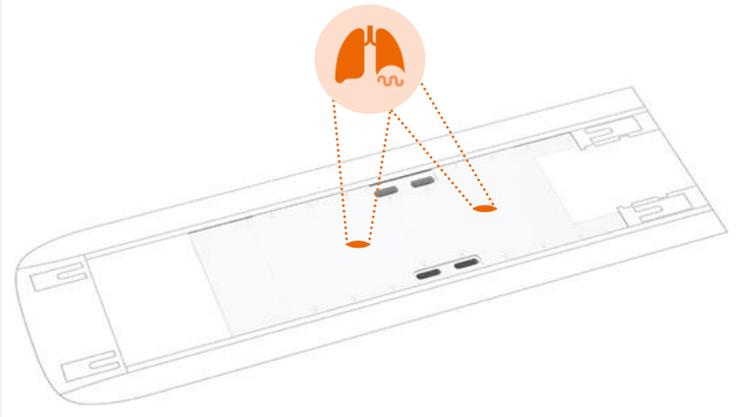
Powered by Tim 4G and  
BioMatrix Technology



# MAGNETOM Sola Tim [204x32] – set of standard coils

## BioMatrix Spine and BioMatrix Body Coil are already included

**BioMatrix Spine 24 with Respiratory Sensors**



**BioMatrix Body 12 with Beat Sensor<sup>1</sup>**



Upgrade available to  
**BioMatrix Body 18**  
with Beat Sensor<sup>1</sup>

**Head/Neck 16**



Upgrade available to  
**BioMatrix Head/ Neck 20**

**Flex 4 Large/Small**



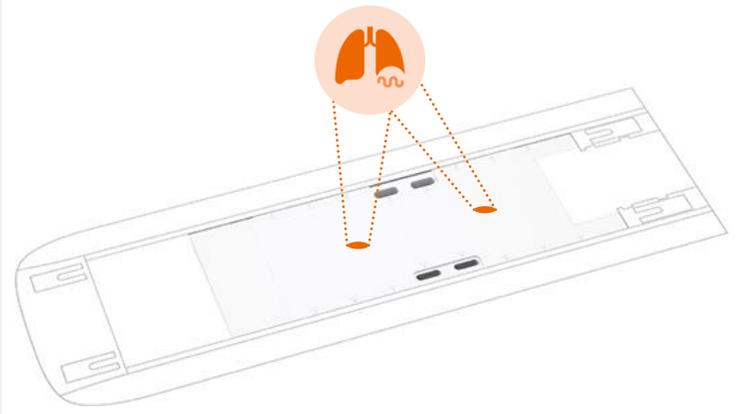
Upgrade available to  
**UltraFlex 18 Large/ Small**

<sup>1</sup> Cardiac Triggering for sequences other than Cardiac cine is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# MAGNETOM Sola – set of standard coils

## BioMatrix Spine and BioMatrix Body Coil are already included

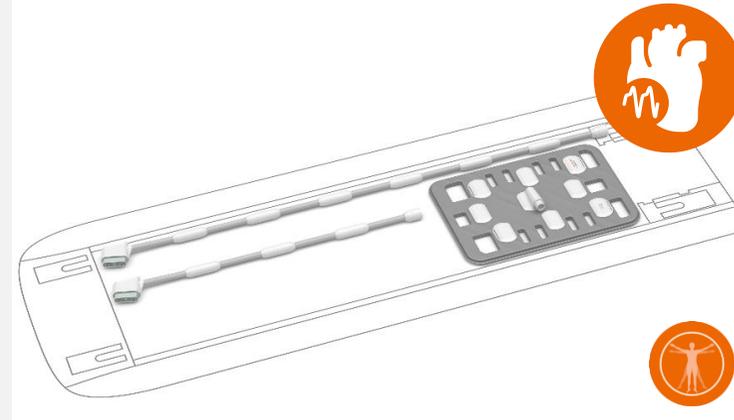
### BioMatrix Spine 32<sup>1</sup> & Spine 48<sup>2</sup> with Respiratory Sensors



### Head/Neck 20 Tiltable and with Coilshim



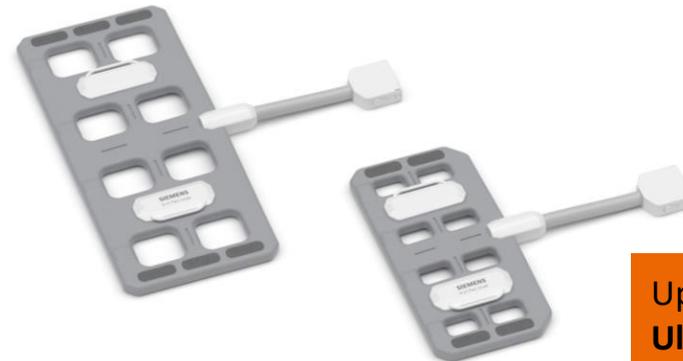
### Body 18



Upgrade available to  
**Contour Coil 24**

Upgrade available to  
**BioMatrix Body 18**  
with Beat Sensor<sup>3</sup>

### Flex 4 Large/Small



Upgrade available to  
**UltraFlex 18 Large/ Small**

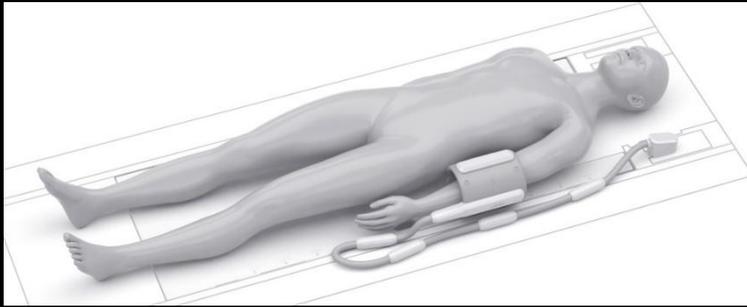
<sup>1</sup> Available for MAGNETOM Sola [204x48]

<sup>2</sup> Available for MAGNETOM Sola [204x64]

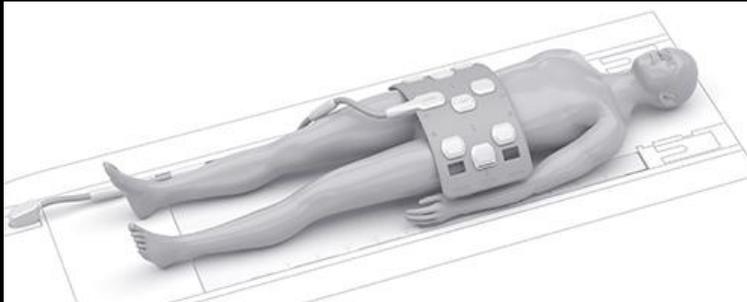
<sup>3</sup> Cardiac Triggering for sequences other than Cardiac Cine is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# UltraFlex 18 coils

## Up to 54% faster scans and higher spatial resolution

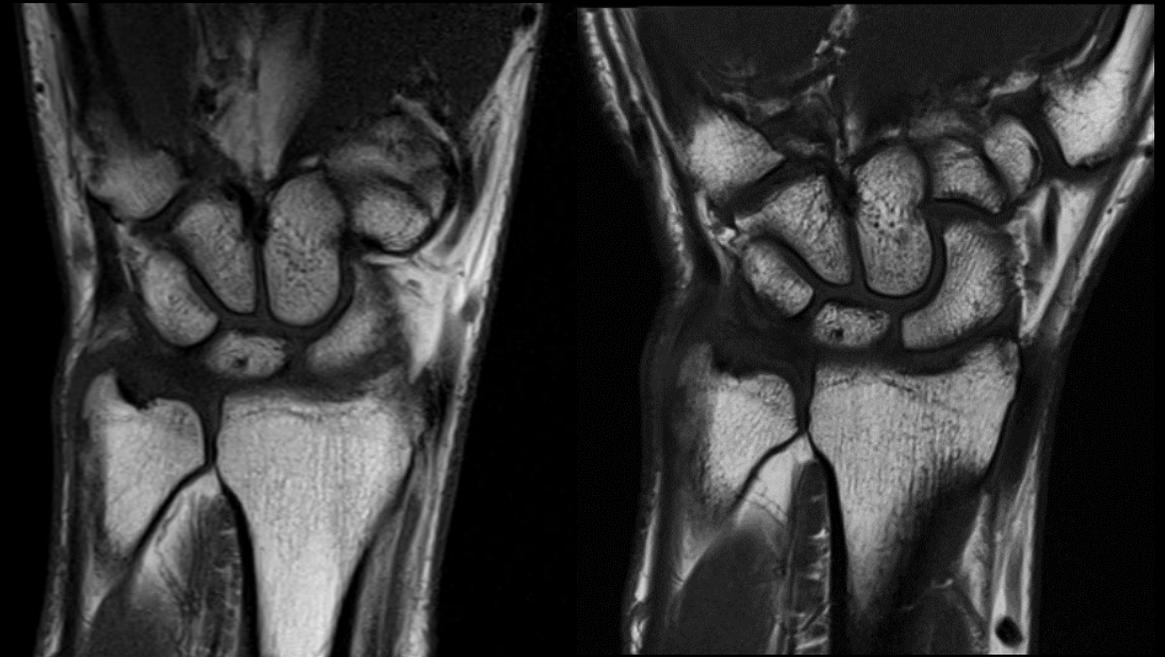


UltraFlex 18  
Small



UltraFlex 18  
Large

.....  
New dedicated positioning aids hold coils  
in place and ensure easy and fast coil setup  
.....



Flex 4  
Matrix size  
269 x 384  
TA 4:26 min

UltraFlex 18 Small  
Matrix size  
346 x 384  
TA 2:20 min

# Increased resolution and faster acquisition with UltraFlex 18 coils at MAGNETOM Sola – wrist imaging

Flex Small 4



T1 TSE  
matrix size  
269 x 384  
TA 4:06 min

UltraFlex Small 18



T1 TSE **with PAT 2**  
matrix size  
**346 x 384**  
TA **2:20 min**

High PAT factors with  
the high coil density



PD fs  
matrix size  
192 x 384  
TA 4:58 min



PD fs **with PAT 2**  
matrix size  
**346 x 384**  
TA **3:33 min**

# Increased resolution and faster acquisition with UltraFlex 18 coils at MAGNETOM Sola – elbow imaging

Flex Small 4



T1 TSE  
matrix size  
224 x 320  
TA 2:08 min

UltraFlex Small 18

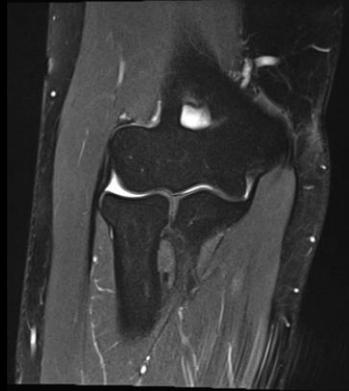


T1 TSE **with PAT 2**  
matrix size  
**307 x 384**  
TA **1:36 min**

High PAT factors with  
the high coil density



PD fs  
matrix size  
266 x 320  
TA 3:18 min



PD fs **with PAT 2**  
matrix size  
**365 x 384**  
TA **2:22 min**

# Contour Coils – designed for comfort



Contour 24



Contour 48



- Highly flexible coil with blanket-like feeling
- Super comfortable & light weight
- Easy positioning and workflow
- Great image quality
- Large coverage



**Improving  
Patient Experience**

# Contour 48

## Abdomen with maximum coverage



3D T1 VIBE Dixon water  
PAT 5, composed  
2.6 x 2.6 x 2.0 mm  
TA 4:19 min (multi breath-hold)



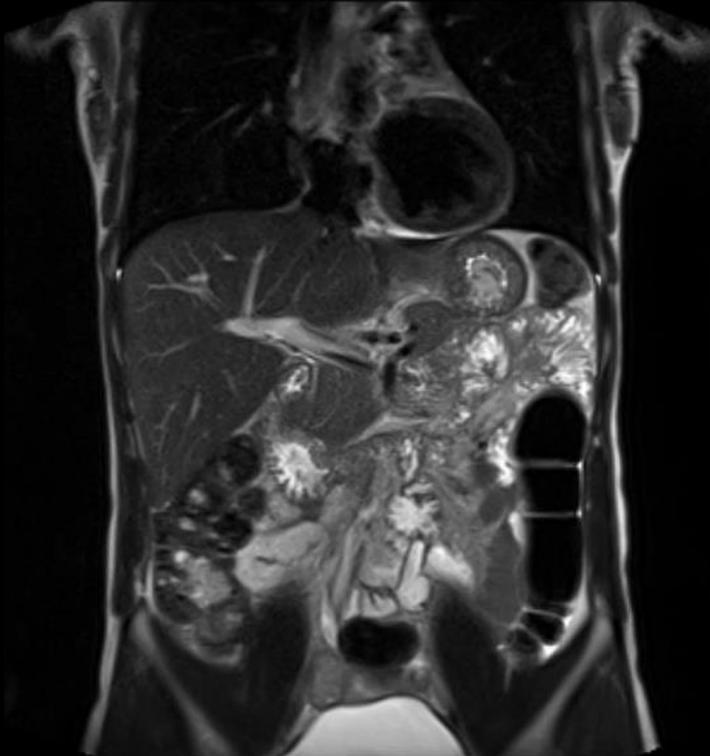
T2 STIR  
PAT 3, composed  
2.0 x 2.0 x 7.2 mm  
TA 3:13 min (multi breath-hold)

**73 cm  
coverage**

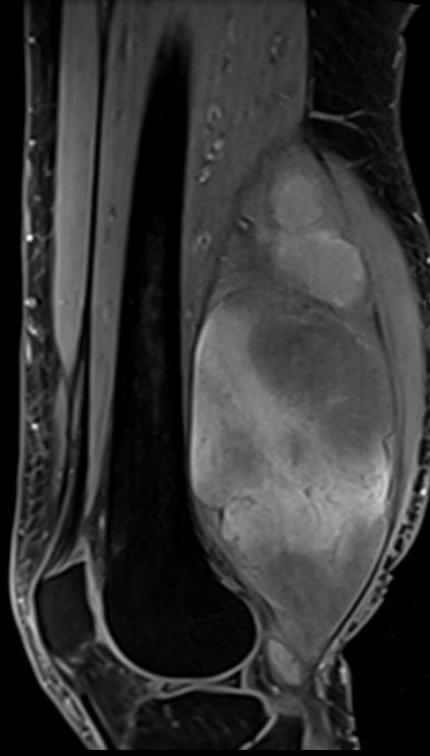
**with Contour 48  
without repositioning**

# Contour Coil 24

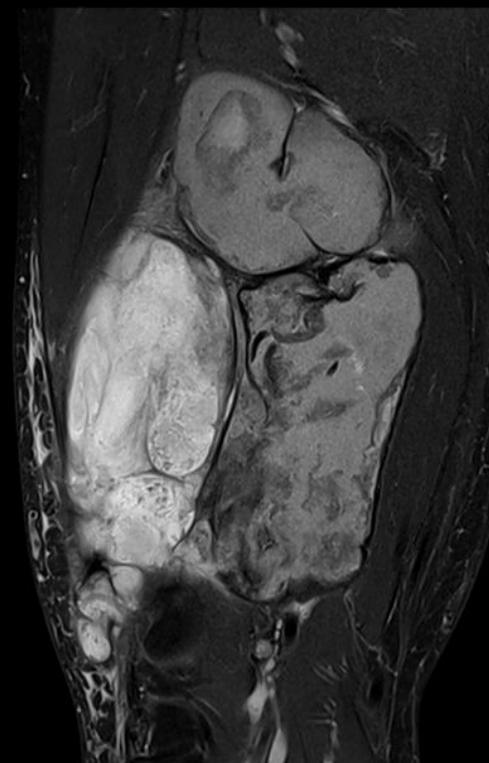
## Combining high-resolution imaging and patient comfort



T2 HASTE  
PAT 3  
1.3 x 1.3 x 6.0 mm<sup>3</sup>  
TA 1:51 min



T1 TSE sag Dixon  
0.5 x 0.5 x 3.0 mm<sup>3</sup>  
TA 1:50 min



T2 tse fs cor Dixon  
0.3 x 0.3 x 3.0 mm<sup>3</sup>  
TA 3:33 min

# BioMatrix Body 18 – expanding our portfolio of patient-friendly, flexible, and high element density coils



- New flexible coil material
- With integrated BeatSensor<sup>1</sup>
- Exchangeable cable

## BioMatrix Body 18

with integrated  
Beat Sensor<sup>1</sup>



Improving  
Patient Experience



<sup>1</sup> Cardiac Triggering for sequences other than Cardiac Cine is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# High-resolution abdominal imaging and enhanced patient comfort with BioMatrix Body 18 and Contour Coil 24



**NEW** BioMatrix Body 18  
with Beat Sensor<sup>1</sup>



T2 HASTE

PAT 3

1.3 x 1.3 x 6.0 mm<sup>3</sup>

TA 2:18 min



Contour Coil 24

TWIST

iPAT 4

1.1 mm iso

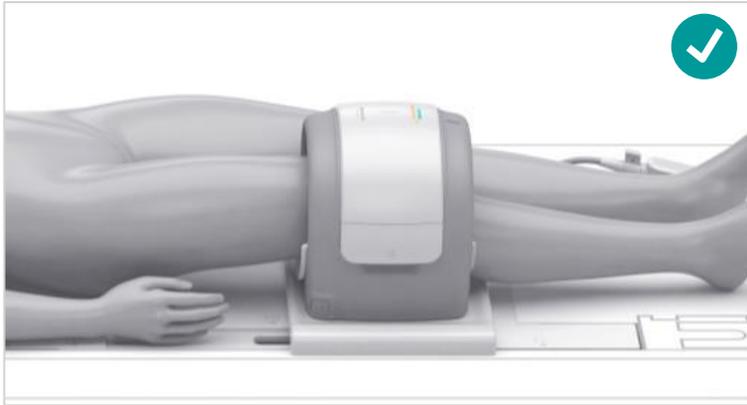
TA 0:04 min / measurement



**Increased patient  
comfort with  
blanket-like  
feeling and  
ultra-high density  
coils**

<sup>1</sup> Cardiac Triggering for sequences other than Cardiac Cine is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# Fast & high-quality MSK imaging with dedicated high element density coils



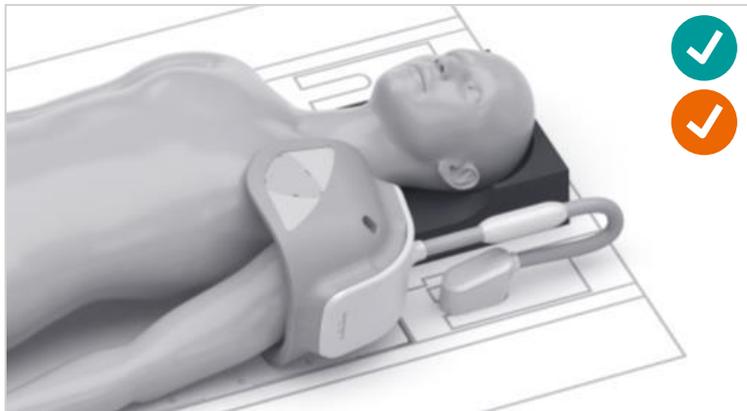
Accommodate  
more patients with  
a flared opening

**Tx/Rx Knee 18**



**Hand / Wrist 16**

interchangeable with  
MAGNETOM Altea



Optimal fit to  
patient anatomy  
with flexible coil  
elements

**Shoulder Shape 16**



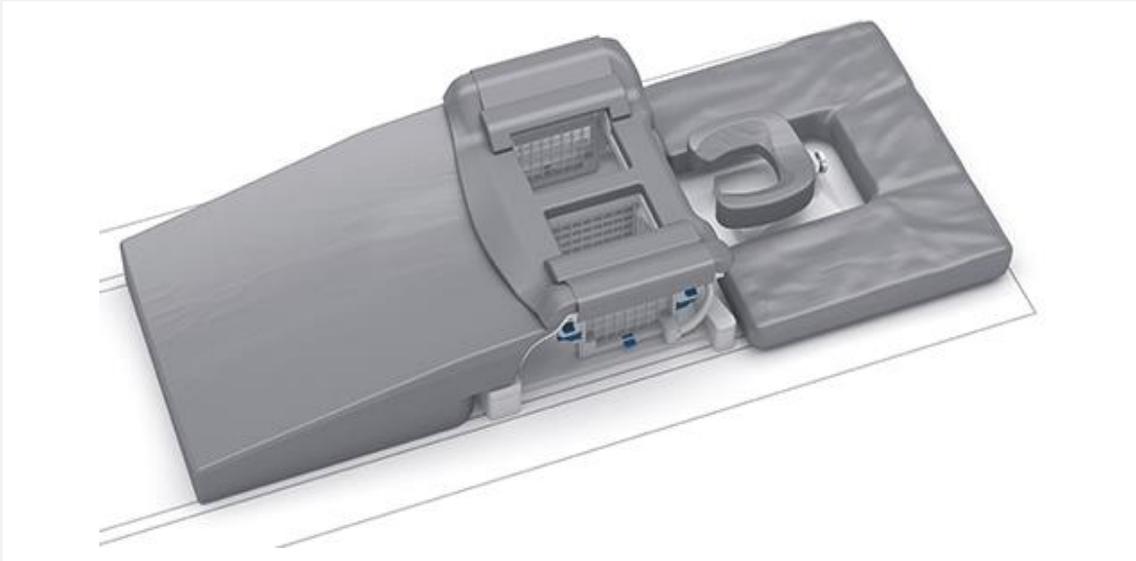
**Foot / Ankle 16**

interchangeable with  
MAGNETOM Aera

interchangeable with  
MAGNETOM Amira

# Breast Coils for biopsy and imaging at MAGNETOM Sola

## Breast BI 7



- 7-ch design for both imaging and biopsy
- LED light assists during biopsies
- Both grid and post/pillar biopsy supported
- Optional cranio-caudal compression

## Breast 18

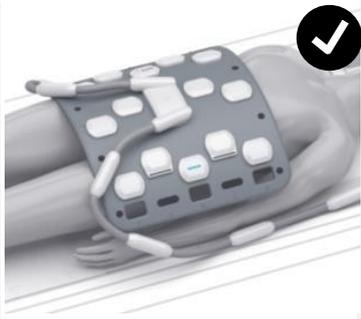


## 2/10/16 Sentinelle Breast

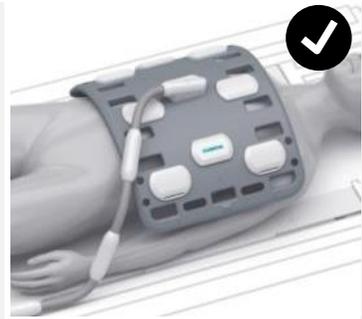


- Breast Biopsy Software supports Breast BI 7, 2/10/16/Sentinelle Breast and 2/4/8 Sentinelle Breast

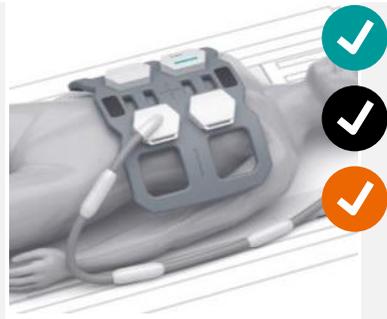
# Comprehensive coil portfolio at MAGNETOM Sola



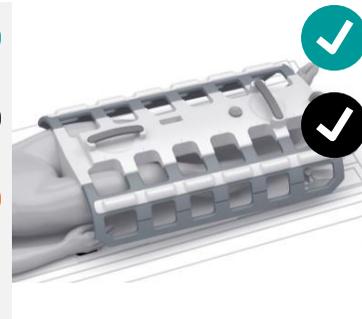
Body 30



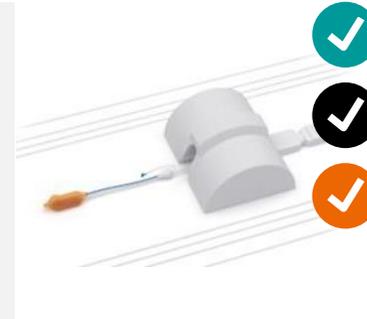
Body 18 Long



Body 6



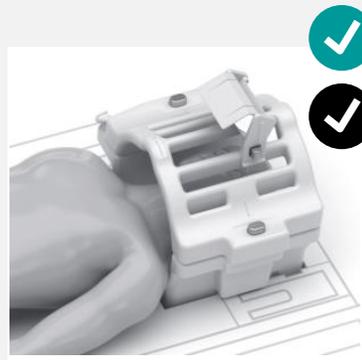
Peripheral  
Angio 36



Endorectal  
Coil Kit<sup>2</sup>



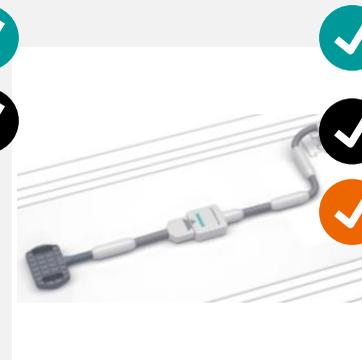
Loop Coils



Tx/Rx CP  
Head Coil



Pediatric 16<sup>1</sup>



Special Purpose 4

interchangeable with  
MAGNETOM Altea

interchangeable with  
MAGNETOM Aera

interchangeable with  
MAGNETOM Amira

If a coil is intended to be used on different systems, it is recommended that the HQ be consulted and channel configurations must be considered.

<sup>1</sup> MR scanning has not been established as safe for imaging fetuses and infants under two years of age. The responsible physician must evaluate the benefit of the MRI examination in comparison to other imaging procedures. <sup>2</sup> The products/features (here mentioned) are not commercially available in some countries. Due to regulatory reasons their future availability cannot be guaranteed.

Please contact your local Siemens organization for further details.

# MAGNETOM Sola

## Embrace human nature at 1.5T with BioMatrix



Embrace full 1.5T performance

Tim 4G Coil portfolio and BioMatrix Technology

Embrace true 1.5T productivity

With Deep Resolve, Turbo Suite and myExam Companion<sup>1</sup>

Embrace new 1.5T clinical capabilities

With Inline Compressed Sensing

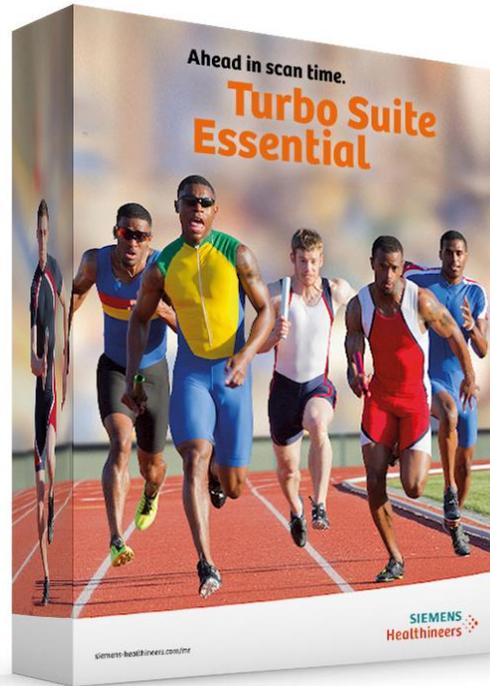
<sup>1</sup> myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# Turbo Suite

Setting the pace in  
MR acceleration



# Turbo Suite – Setting the pace in MRI acceleration



**Turbo Suite Essential**

Routine exams in  
10 – 15 minutes<sup>1</sup>



**Turbo Suite Excelerate**

Up to 50%<sup>1</sup>  
time savings



**Turbo Suite Elite**

Expand clinical  
capabilities

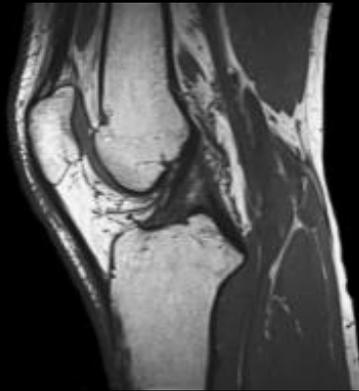
<sup>1</sup> Data on file.

# Turbo Suite Essential Ahead in scan time.

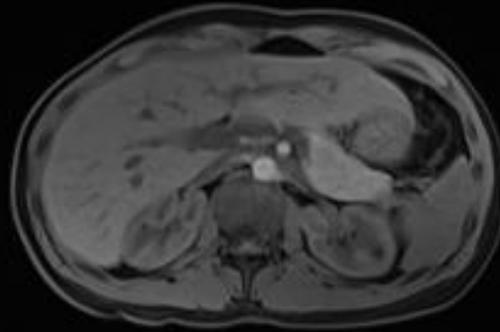
10 – 15 minutes scan time<sup>1</sup>  
for routine examinations



iPAT, iPAT<sup>2</sup>, T-PAT



CAIPIRINHA SPACE



CAIPIRINHA VIBE

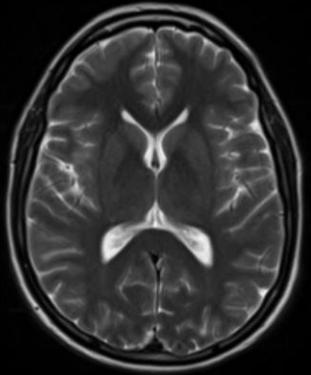
Our core MR acceleration techniques to maximize productivity  
Already included in the standard configuration



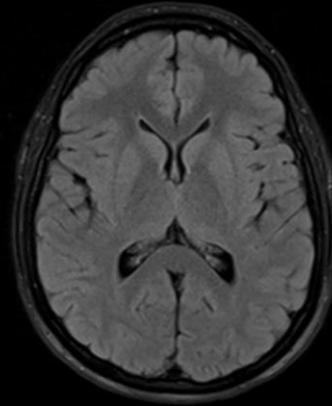
<sup>1</sup> Data on file.

# Neuro imaging with Turbo Suite Essential Ahead in scan time.

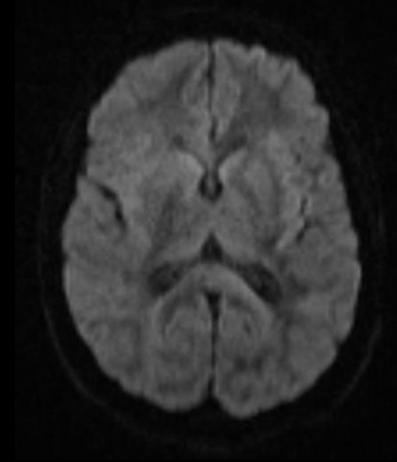
## Turbo Suite Essential



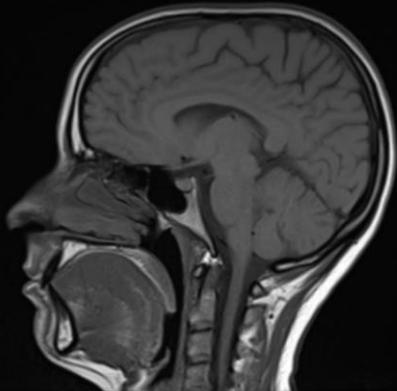
T2 TSE  
iPat2  
0.9 x 0.9 x 5 mm<sup>3</sup>  
0:40 min



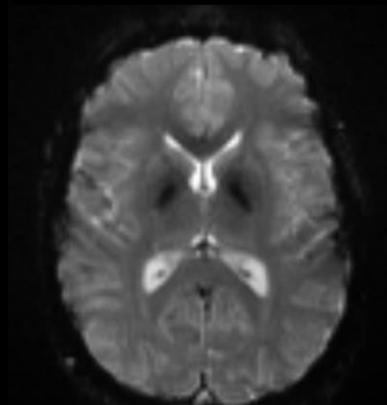
T2 TSE Dark Fluid  
0.4 x 0.4 x 5 mm<sup>3</sup>  
1:28 min



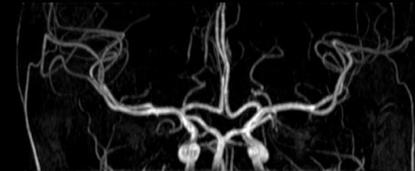
DWI  
iPat2, b800  
1.6 x 1.6 x 5 mm<sup>3</sup>  
1:19 min



T1 SE  
iPat2  
0.9 x 0.9 x 5 mm<sup>3</sup>  
1:18 min



T2\*  
1.7 x 1.7 x 5 mm<sup>3</sup>  
0:06 min



3D TOF MIP  
PAT 2  
0.1 x 0.1 x 0.6 mm<sup>3</sup>  
3:45 min

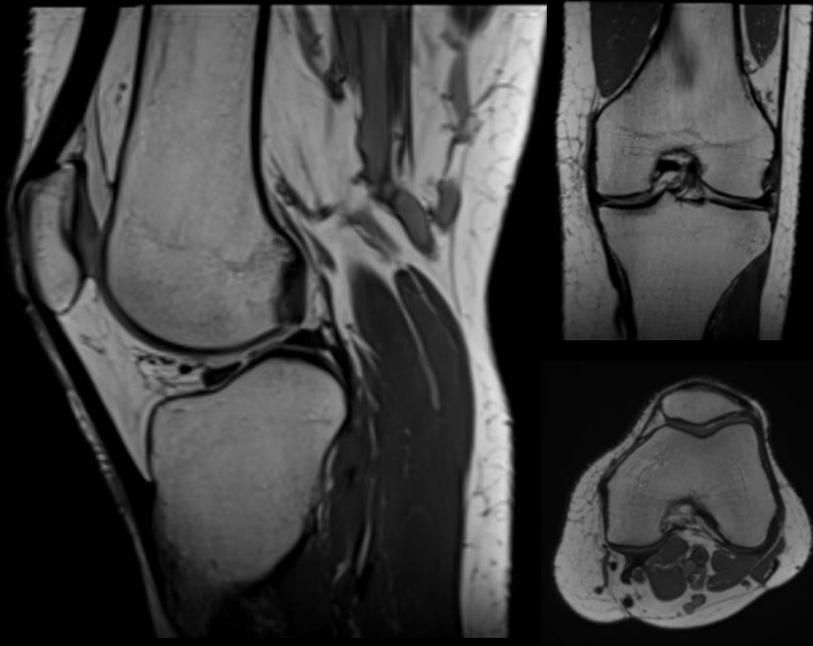
**Total exam 8:36 min**

# MSK imaging with Turbo Suite Essential

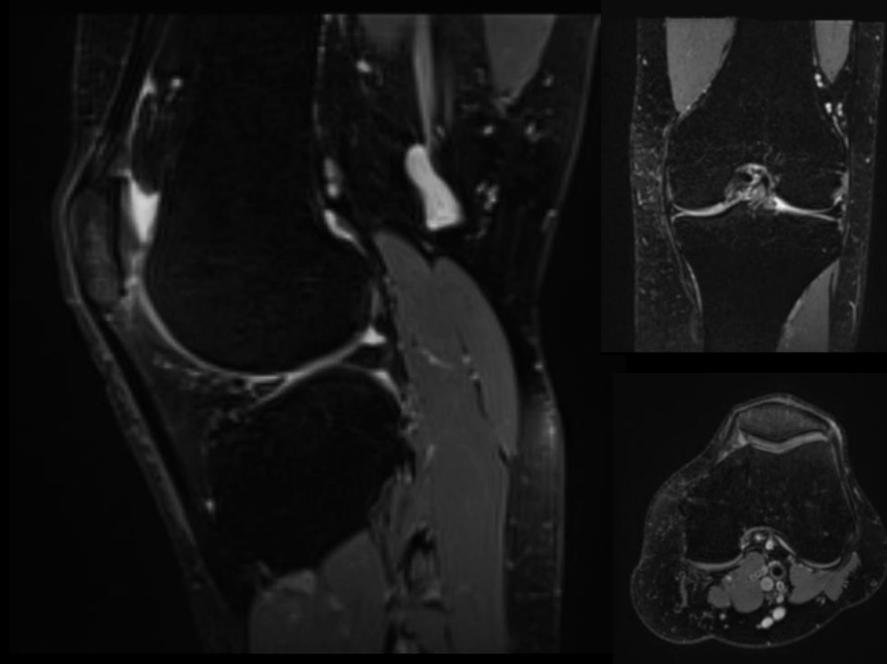
## High resolution, 3D exam in 10 minutes

### Turbo Suite Essential

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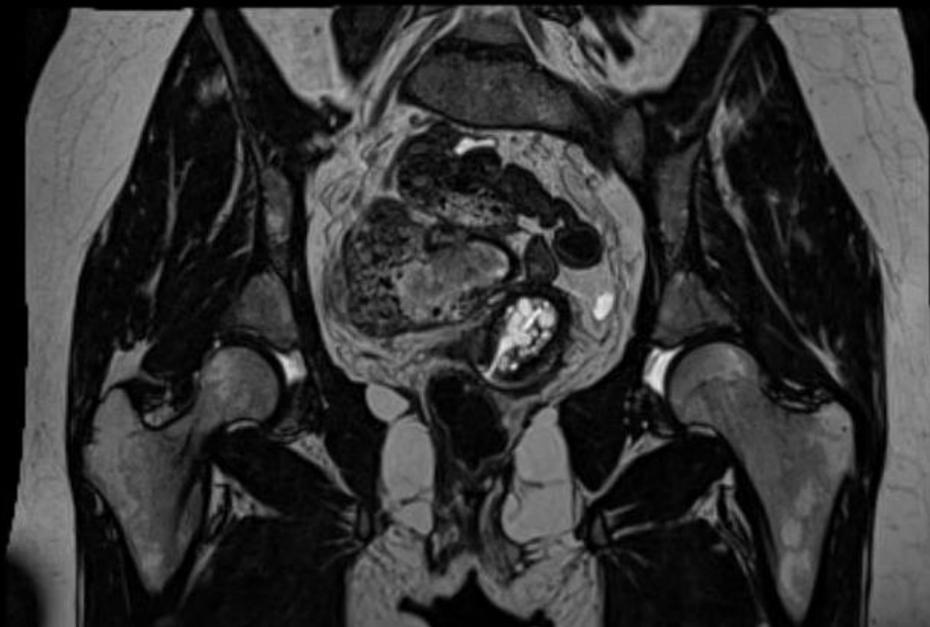
PD, 0.6 mm iso  
CAIPIRINHA 4  
TA 4:03 min



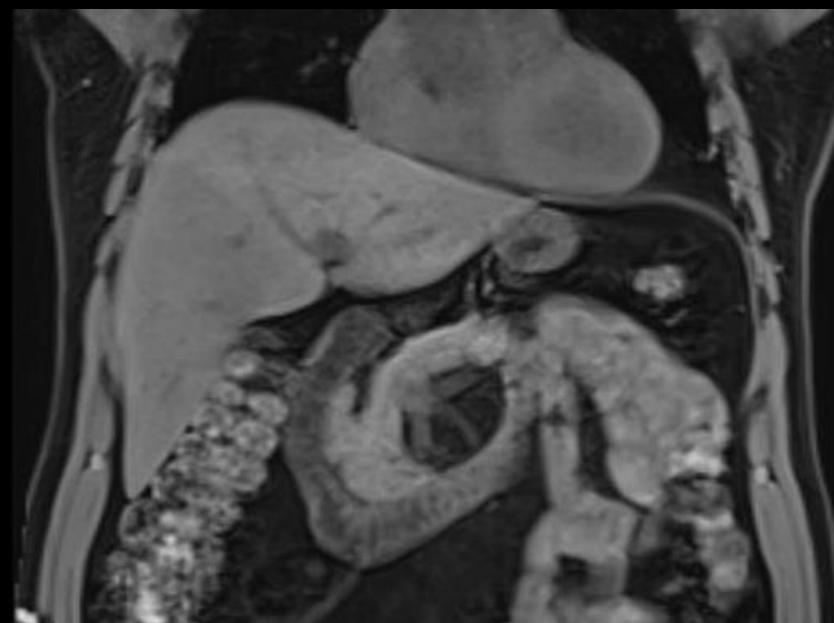
T2 fs, 0.8 mm iso  
CAIPIRINHA 4  
TA 5:57 min

**10 min**  
enabled by unique  
CAIPIRINHA SPACE

# Body imaging with Turbo Suite Essential Ahead in scan time.



T2 SPACE, 0.9 mm iso  
CAIPIRINHA 4  
TA 5:03 min

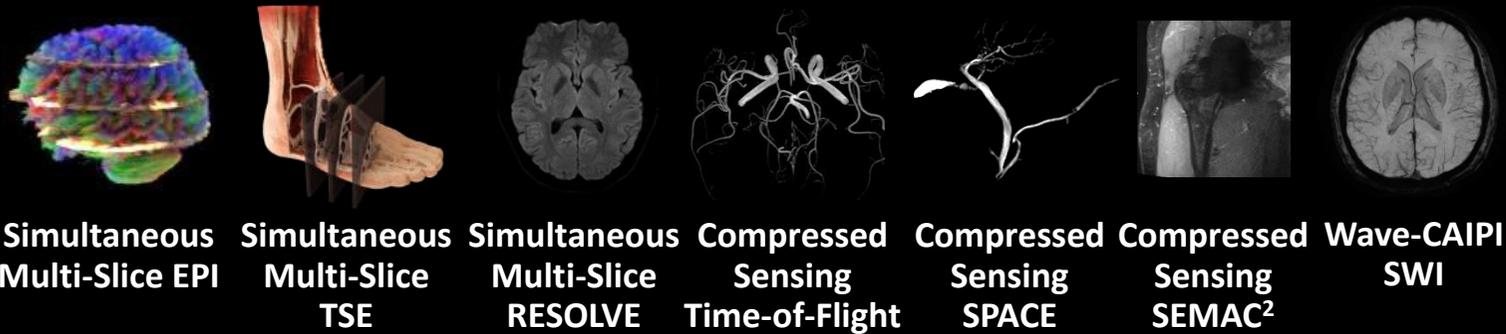


3D T1 VIBE dixon  
PAT 5  
TA 0:17 min

# Turbo Suite Excelerate

## One step ahead in acceleration

Up to 50% time savings<sup>1</sup>  
provide a paradigm shift in productivity



Cutting edge 2D static and 3D static acceleration



<sup>1</sup> Data on file.

<sup>2</sup> 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. <sup>3</sup> SWI license required in addition.

# Turbo Suite Excelerate

## One step ahead in acceleration

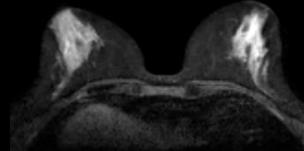
### Conventional



PD TSE, PAT 2  
0.4 x 0.4 x 3 mm<sup>3</sup>  
TA 2:14 min



DWI  
PAT 3, b800  
1.6 x 1.6 x 6.0 mm<sup>3</sup>  
TA 3:09 min



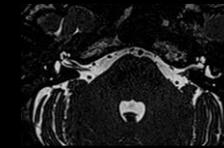
RESOLVE  
b800  
1.6 x 1.6 x 6.0 mm<sup>3</sup>  
TA 5:22 min



3D TOF MIP  
0.5 mm iso  
TA 6:40 min



T2 SPACE MIP  
MRCP, PAT 3  
0.5 x 0.5 x 1.0 mm<sup>3</sup>  
TA 5:51 min  
respiratory triggered



T2 SPACE  
PAT 2  
0.3 x 0.3 x 0.6 mm<sup>3</sup>  
TA 5:13 min



SEMAC<sup>1</sup>  
PAT 3  
0.9 x 0.9 x 3.0 mm<sup>3</sup>  
TA 6:54 min

### Turbo Suite Excelerate

**53%**  
Reduction

**50%**  
Reduction

**45%**  
Reduction

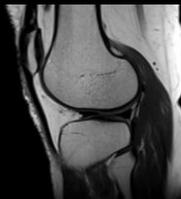
**70%**  
Reduction

**96%**  
Reduction

**55%**  
Reduction

**56%**  
Reduction

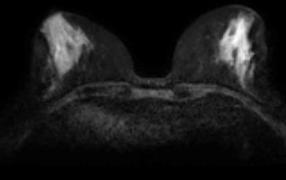
### Powered by Simultaneous Multi-Slice and Compressed Sensing



PD TSE SMS  
PAT 2, SMS 2  
0.4 x 0.4 x 3 mm<sup>3</sup>  
TA 1:03 min



SMS DWI  
PAT 2, SMS 2, b800  
1.6 x 1.6 x 6.0 mm<sup>3</sup>  
TA 1:35 min



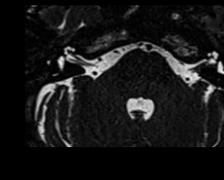
SMS RESOLVE  
SMS 2, b800  
1.6 x 1.6 x 6.0 mm<sup>3</sup>  
TA 2:58 min



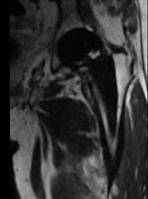
3D CS TOF Angio  
MIP  
0.5 mm iso  
TA 2:00 min



T2 SPACE MIP  
MRCP, CS 23  
0.5 x 0.5 x 1.7 mm<sup>3</sup>  
TA 0:15 min  
breath-hold



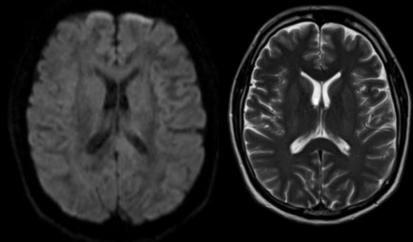
CS T2 SPACE  
CS 6  
0.3 x 0.3 x 0.6 mm<sup>3</sup>  
TA 2:20 min



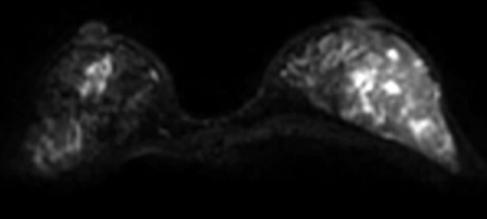
CS SEMAC<sup>1</sup>  
CS 8  
0.9 x 0.9 x 3.0 mm<sup>3</sup>  
TA 3:03 min

<sup>1</sup> 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.

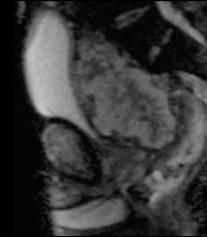
# Significant time savings with Simultaneous Multi-Slice TSE and DWI from head to toe



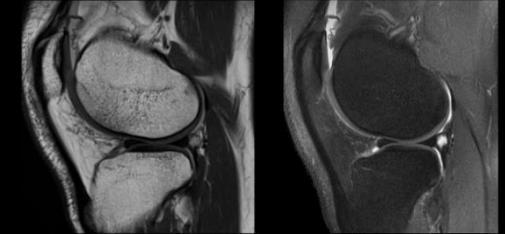
Neuro (DWI/TSE)



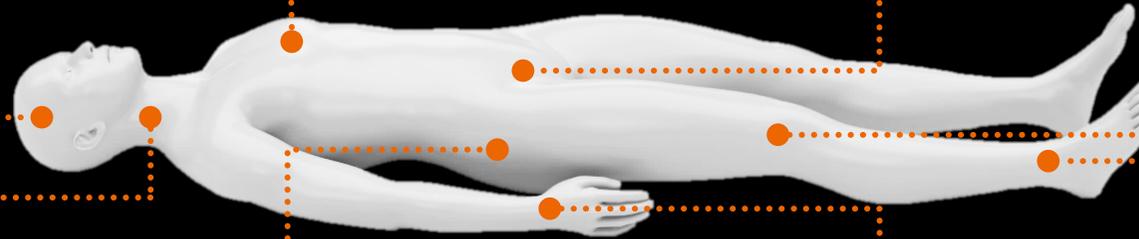
Breast (DWI)



Prostate and Pelvis (DWI)



Knee (TSE)

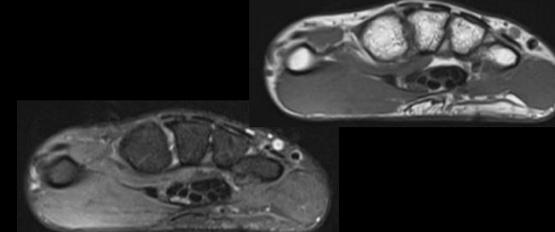
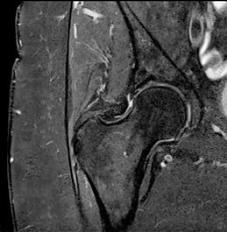
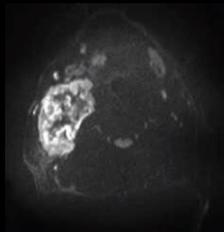


Neck (DWI/TSE)

Hip (TSE)

Hand/Wrist (TSE)

Foot/Ankle (TSE)



# Significantly accelerate entire MSK scans with SMS TSE without compromising image quality



PAT 2, TA 2:14 min



PAT 2 + SMS 2, TA 1:07 min

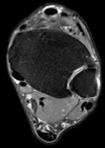
T1 TSE, sag, matrix size 269 x 384

50% reduction in  
scan time

# Significantly accelerate entire MSK scans with SMS TSE

## Foot/Ankle examination

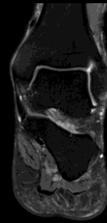
Conventional  
PAT 2



PD TSE FS  
0.4 x 0.4 x 3 mm  
TA 2:36 min



PD TSE FS  
0.3 x 0.3 x 3 mm  
TA 3:10 min



PD TSE FS  
0.4 x 0.4 x 3 mm  
TA 1:31 min



T1 TSE  
0.3 x 0.3 x 3 mm  
TA 1:54 min



T2 TSE  
0.3 x 0.3 x 3 mm  
TA 1:54 min

**11:05**

SMS TSE  
PAT + SMS 2

**35%**  
reduction

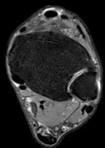
**50%**  
reduction

**50%**  
reduction

**50%**  
reduction

**50%**  
reduction

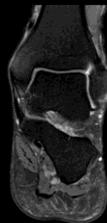
COMPLETE  
EXAMINATION  
**43%**  
reduction



TA 1:42 min



TA 1:35 min



TA 0:45 min



TA 0:57 min



TA 1:17 min

**6:16**

# Simultaneous Multi-Slice DWI – significantly reduce acquisition time for DWI in multiple regions

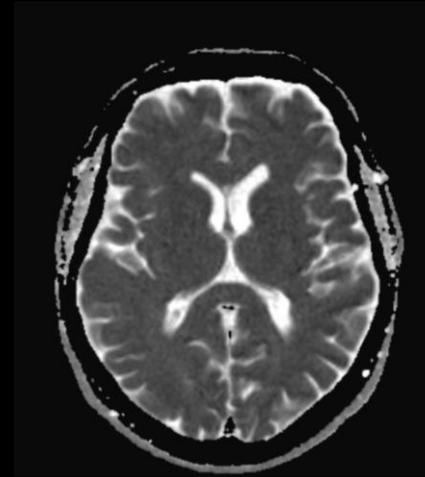
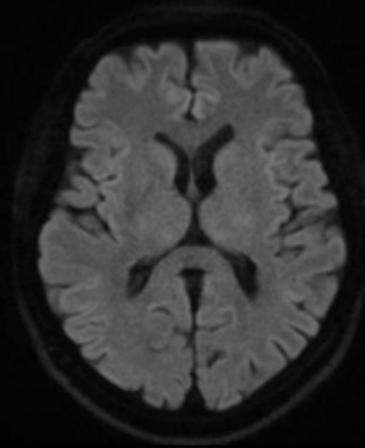
## Conventional

(b1000, ADC map)

Pat 2

0.6 x 0.6 x 4.0 mm<sup>3</sup>

TA 4:28 min



## Turbo Suite Excelerate

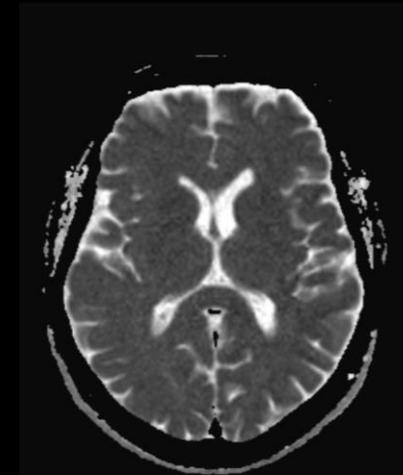
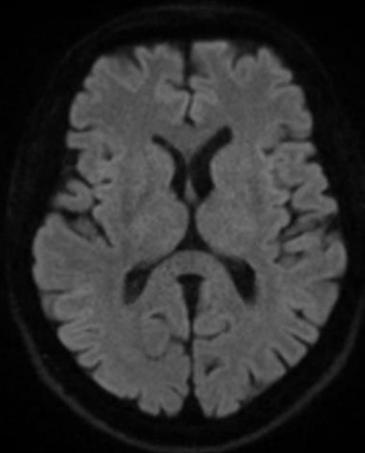
### Simultaneous Multi-Slice

(b1000, ADC map)

0.6 x 0.6 x 4.0 mm<sup>3</sup>

Pat 2, SMS 2

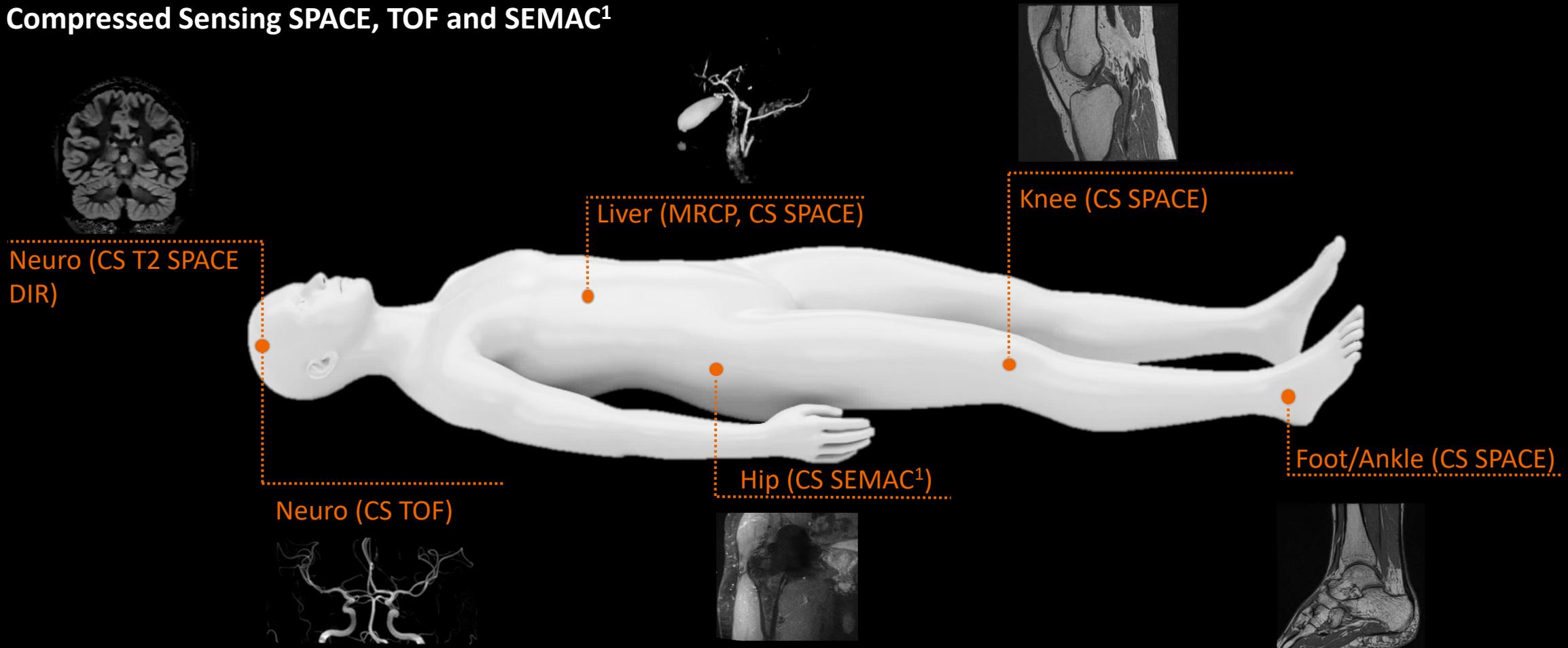
TA 2:17 min



**49%**  
**reduction**  
**in scan time**

# Significant time savings from head to toe with compressed sensing

## Compressed Sensing SPACE, TOF and SEMAC<sup>1</sup>



<sup>1</sup> 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.

# Turbo Suite Excelerate with Compressed Sensing SPACE

## 3D MRCP in a single breath-hold or a fraction of the normal time

### Conventional

---



Standard SPACE  
resp. triggered  
PAT 2, 0.5 x 0.5 x 1.0 mm<sup>3</sup>  
**TA 5:51 min**

### Compressed Sensing SPACE

---



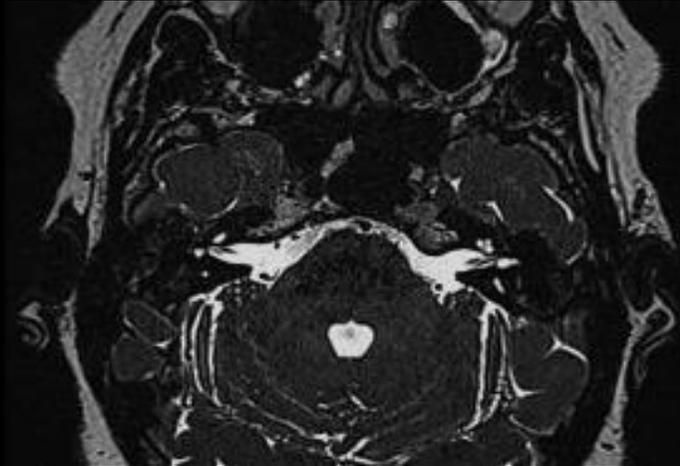
**CS** SPACE  
breath-hold  
**CS 24**, 0.5 x 0.5 x 1.7 mm<sup>3</sup>  
**TA 15 sec**

**96%**  
**reduction**  
**in scan time**

# CS 3D SPACE – increased lesion conspicuity and less partial volume effects due to higher spatial resolution

## Conventional 3D SPACE

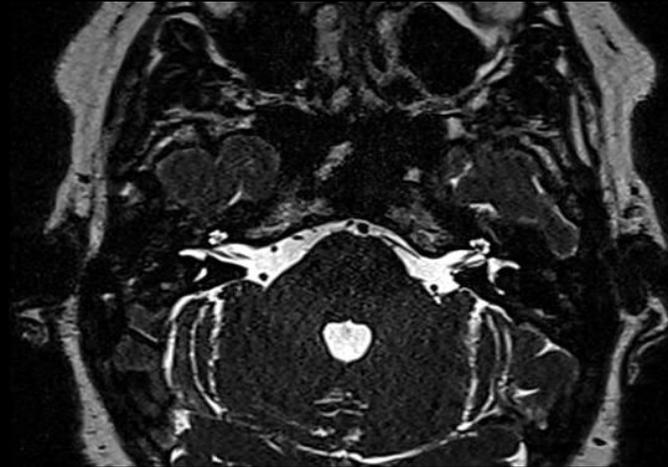
---



3D SPACE T2 iPat 2, 0.3 x 0.3 x 0.6 mm<sup>3</sup>  
TA 5:13 min

## Compressed Sensing 3D SPACE

---



3D SPACE<sup>1</sup> CS 5.8 T2, 0.6 mm iso  
TA 2:20 min

**55%**  
**reduction**  
**in scan time**

# Turbo Suite Excelerate with Compressed Sensing 3D ToF

## Conventional

---



TOF Angio  
0.5 mm iso  
PAT 2, 6:40 min

## Compressed Sensing TOF

---



CS TOF Angio  
0.5 mm iso  
CS 6.5, TA 2:00 min

**70%**  
**reduction**  
**in scan time**

# Wave-CAIPI SWI @ 1.5T

## Up to 53% faster, superior image quality

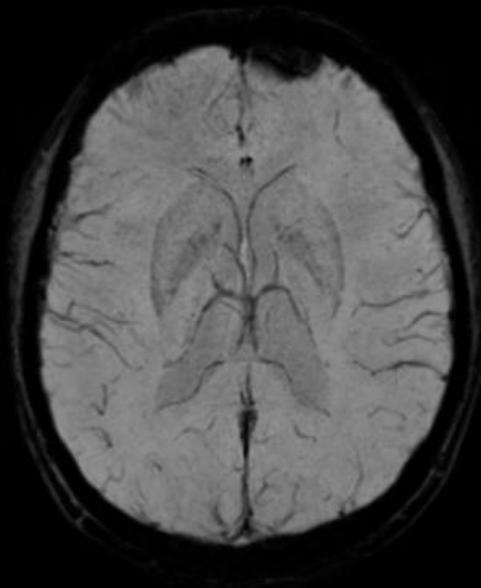


Current standard SWI

Wave-CAIPI

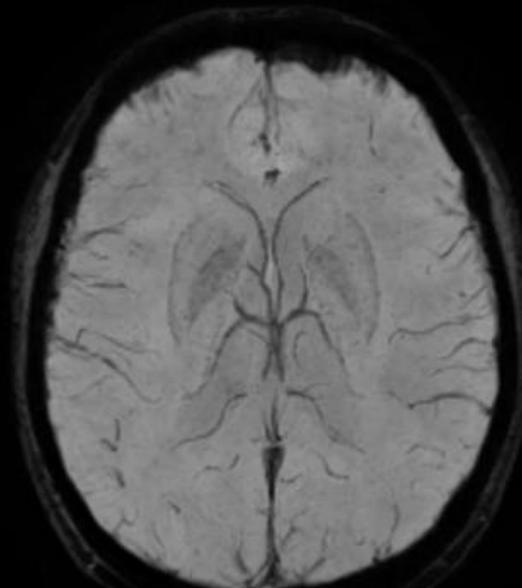
No compromise in IQ, Significantly faster

Diagnostic 3D SWI, in remarkable time



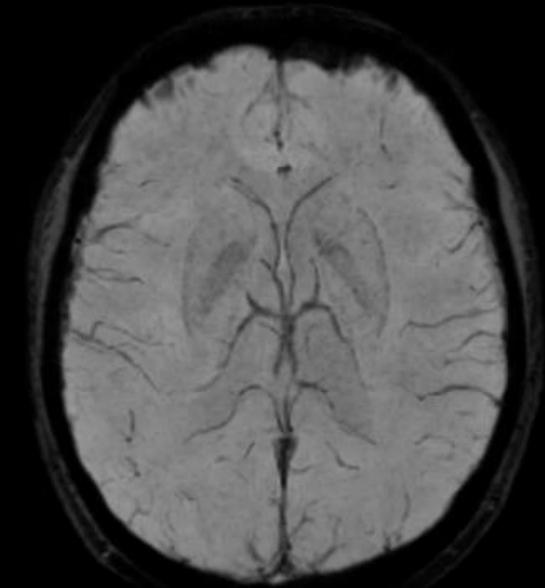
iPAT 4, 0.9x0.9x2.0mm<sup>3</sup>  
TA: 3:49 min

29%



Wave-CAIPI 4, 0.9x0.9x2.0mm<sup>3</sup>  
TA: 2:37 min

53%



Wave-CAIPI 6, 0.9x0.9x2.0mm<sup>3</sup>  
TA: 1:44 min

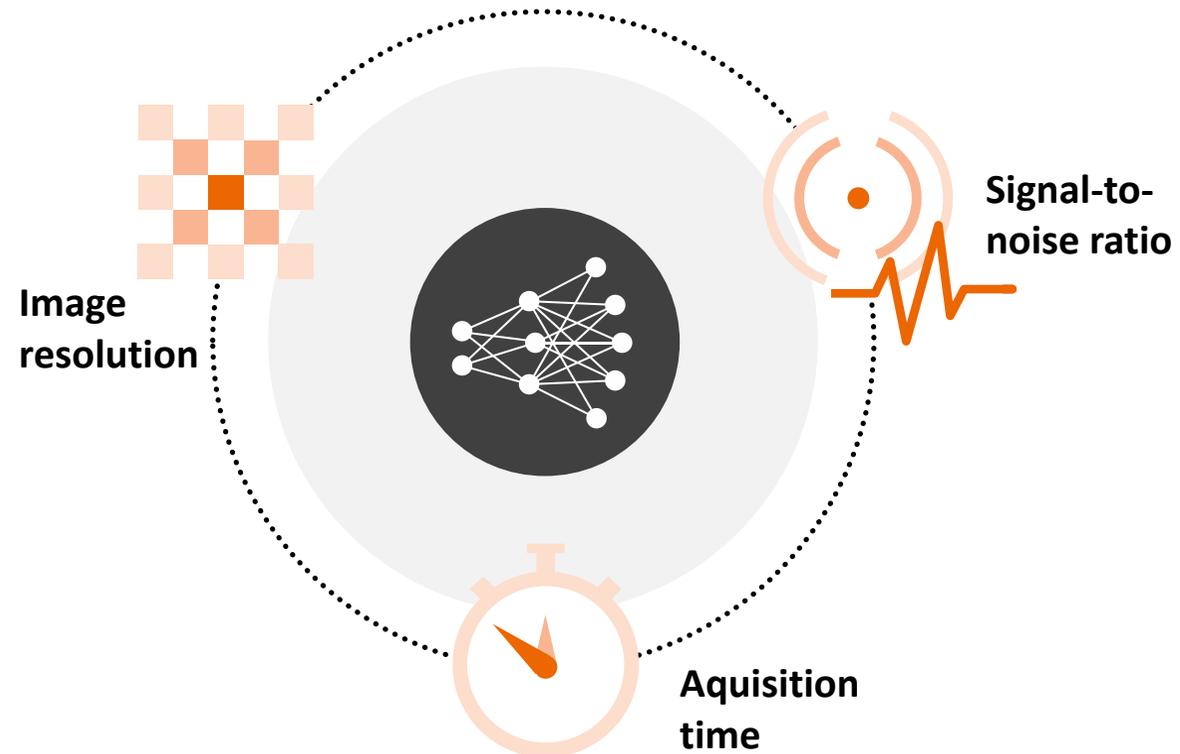


# Deep Resolve

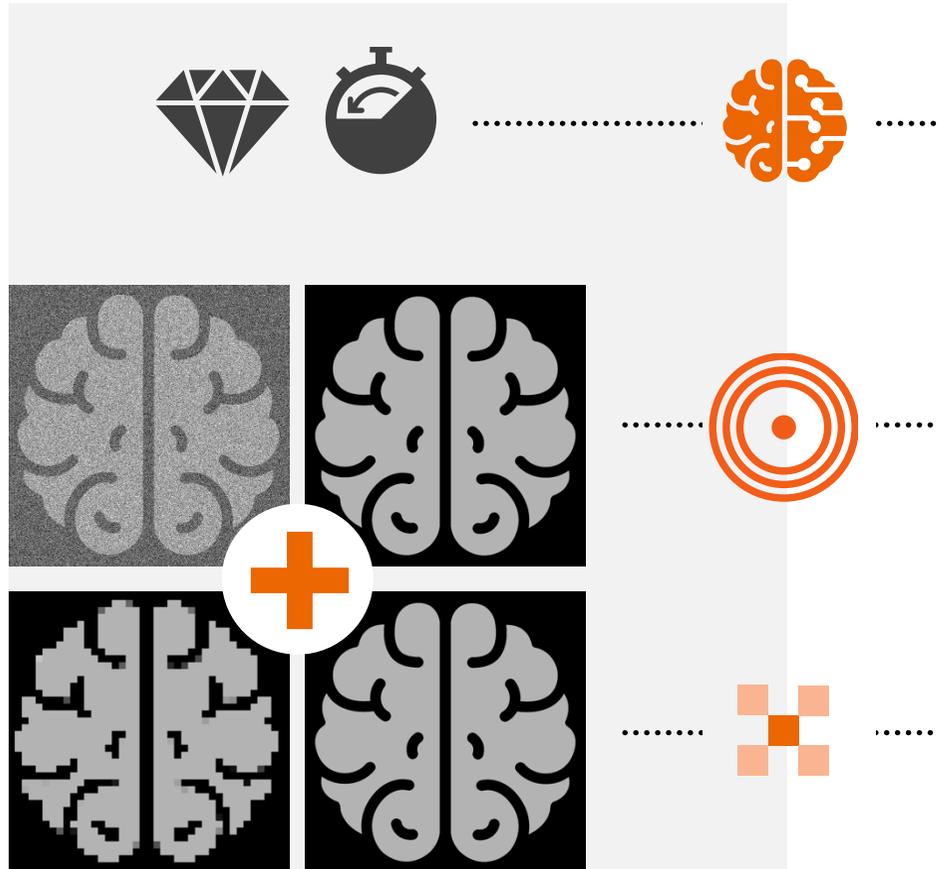
Mobilizing the power of networks

# Today's challenges in acquisition and reconstruction

**Deep learning reconstruction**  
simultaneously improves:



# Deep Resolve at a glance



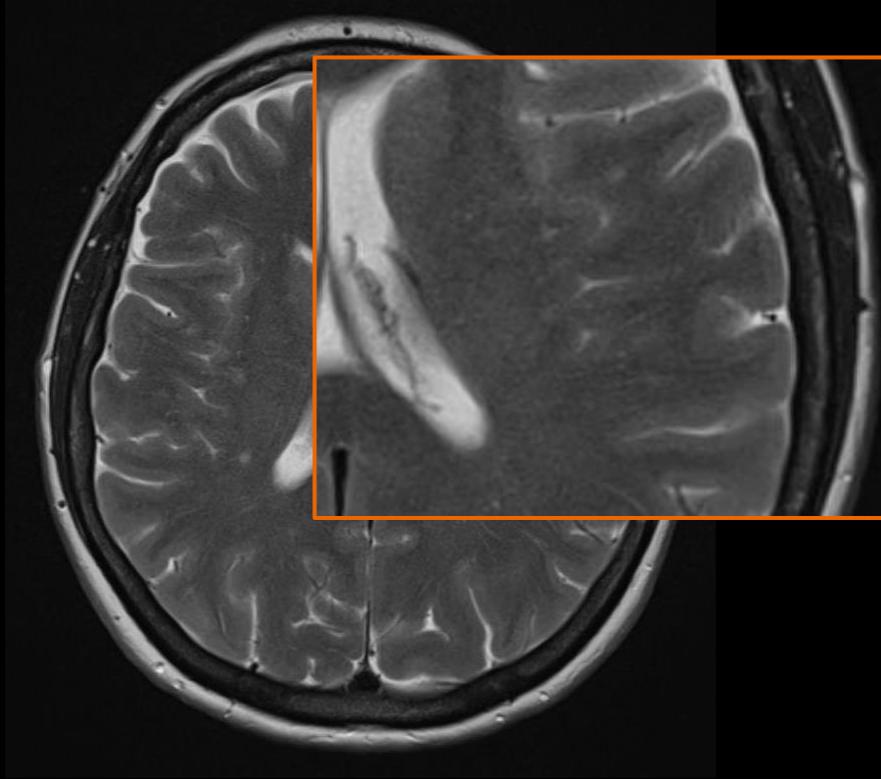
**Deep Resolve** is our new AI-powered advanced image reconstruction technology

**Deep Resolve Gain** addresses locally varying noise with intelligent denoising, resulting in higher signal-to-noise ratio

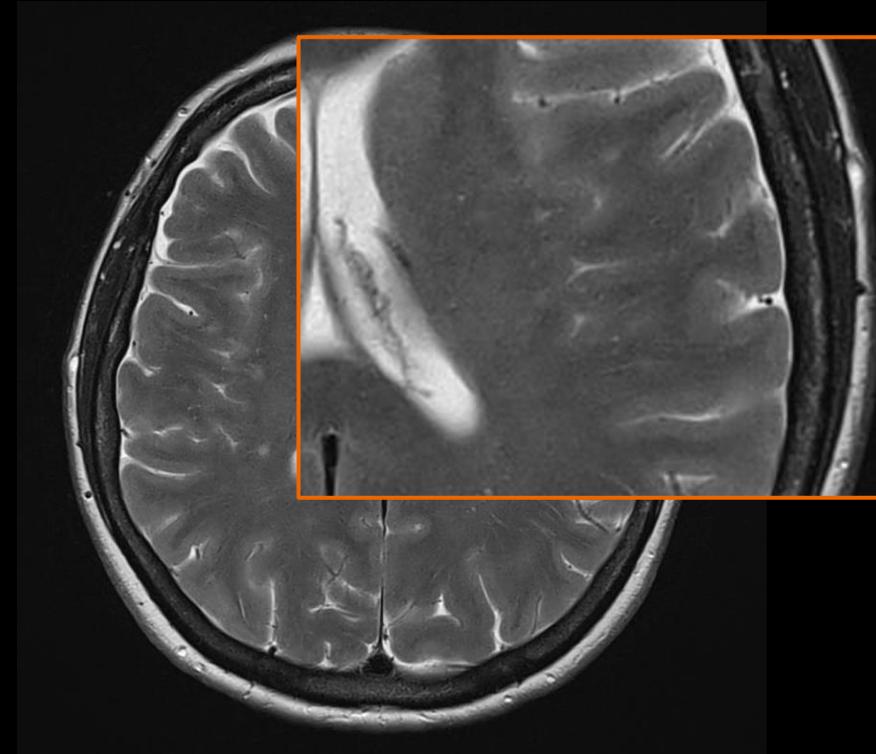
**Deep Resolve Sharp** uses a deep neural network to increase the image sharpness and resolution

# Deep Resolve Gain & Sharp

## Increase the image sharpness and resolution

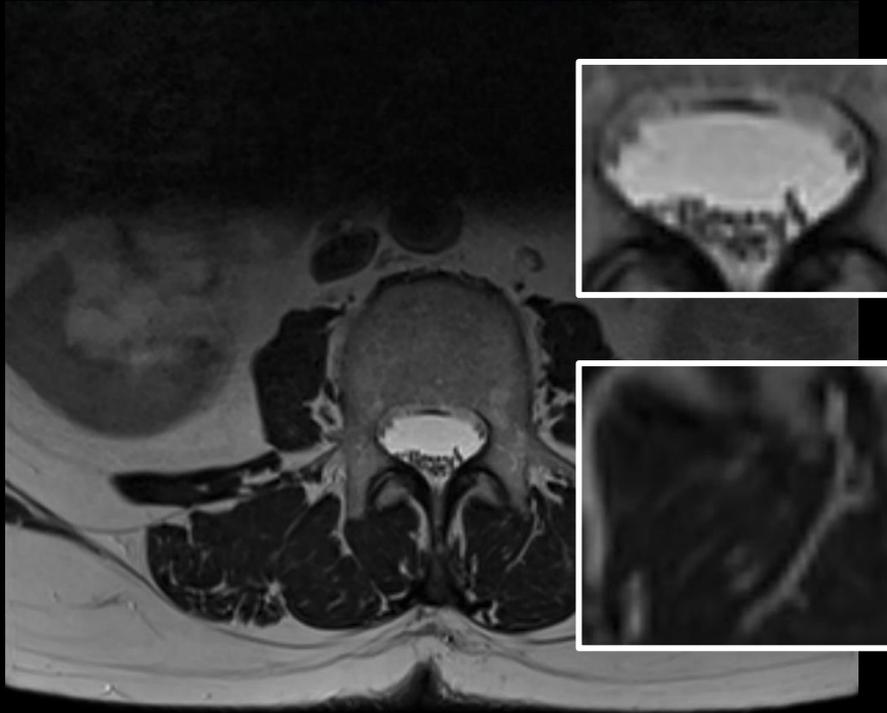


Original:  
T2 TSE Pat 2, TA 2:30 min  
Matrix size: 418 x 512

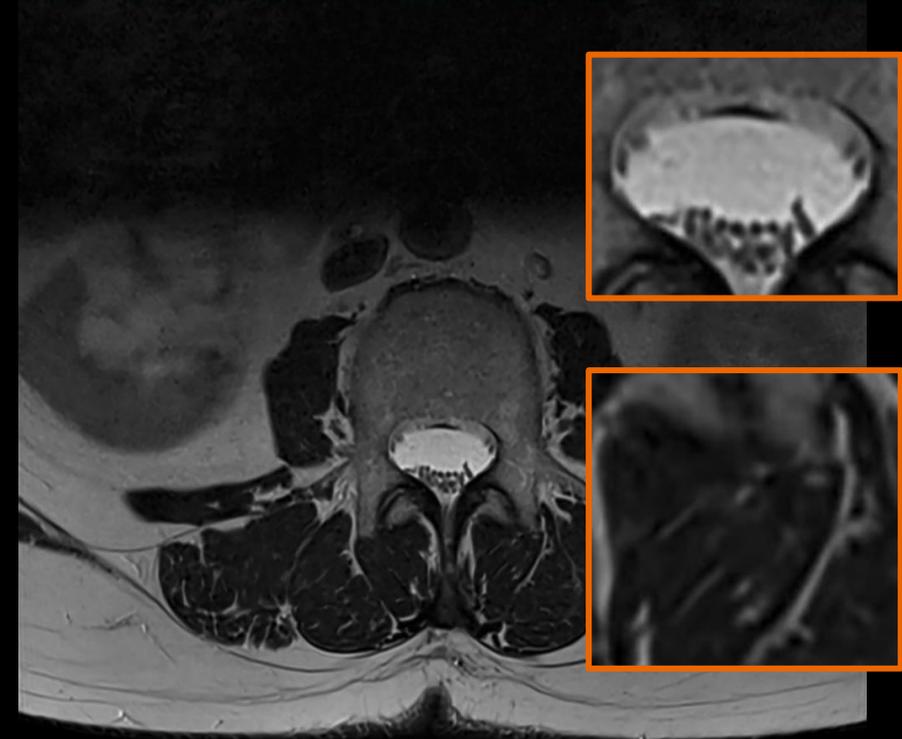


**Deep Resolve Gain & Sharp:**  
T2 TSE, TA 2:30 min  
Matrix size: 835 x 1024

# Deep Resolve Gain & Deep Resolve Sharp – double in-plane resolution for increased sharpness

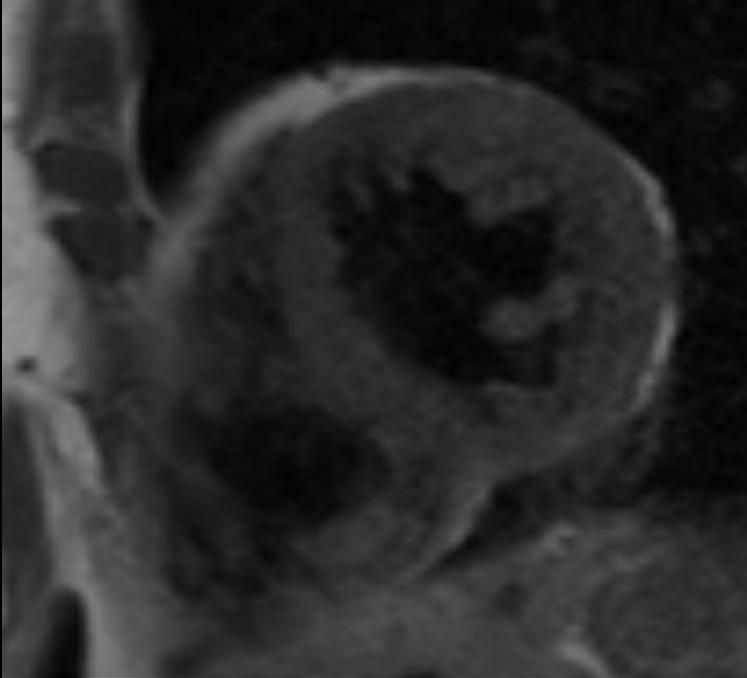


Original:  
T2 TSE, TA 3:45 min  
Matrix size: 256 x 320

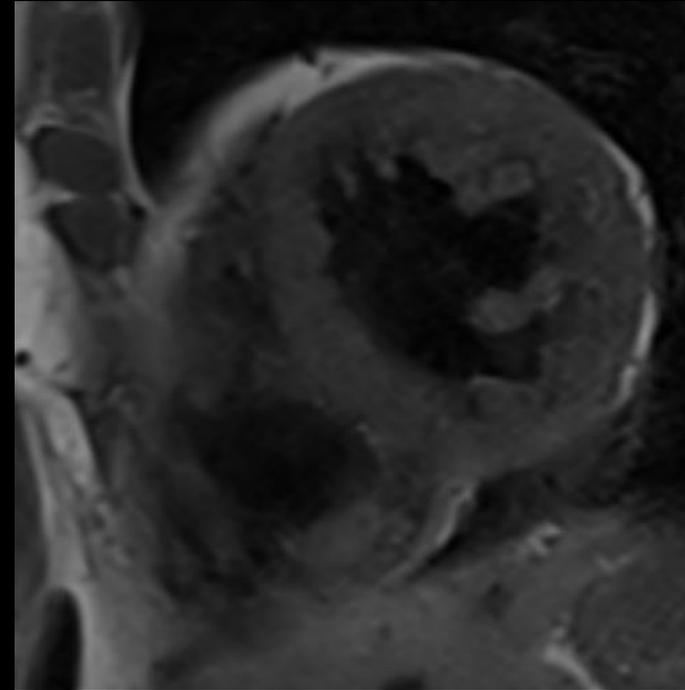


**Deep Resolve Gain & Sharp:**  
T2 TSE, TA 3:45 min  
Matrix size: 512 x 640

# Increase image sharpness in Cardiac exams with Deep Resolve Gain & Sharp



Original:  
T1 TSE, TA 8 s  
Matrix size: 216 x 352

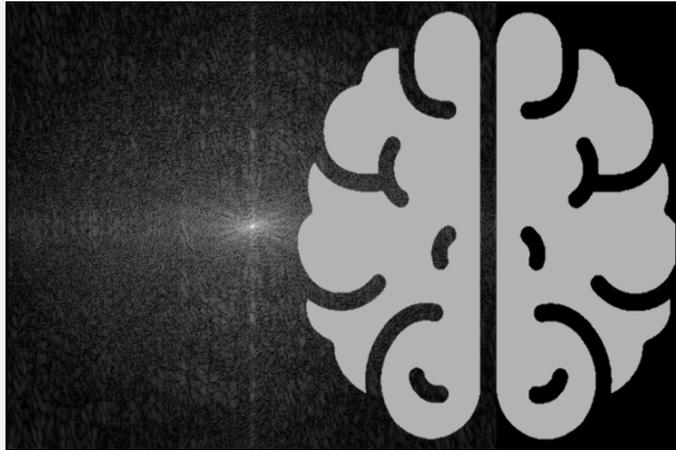


**Deep Resolve Gain & Sharp:**  
T1 TSE, 8 s  
Matrix size: 432 x 704

# Deep Resolve Boost<sup>1</sup>



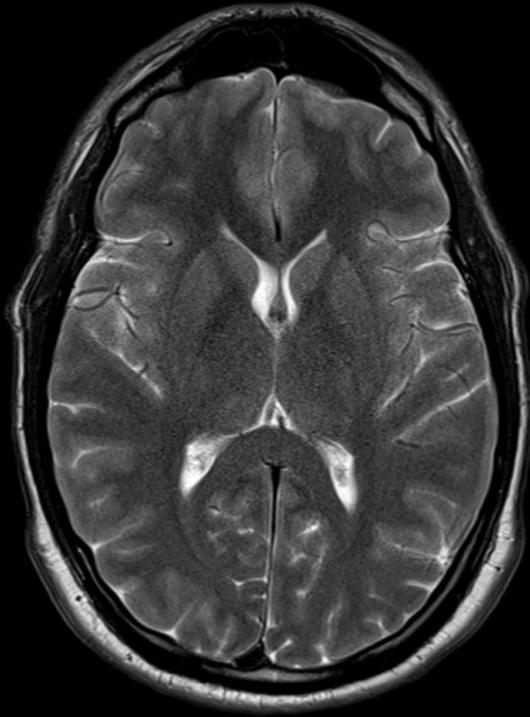
The **Deep Resolve** family is growing even more powerful with **Deep Resolve Boost**



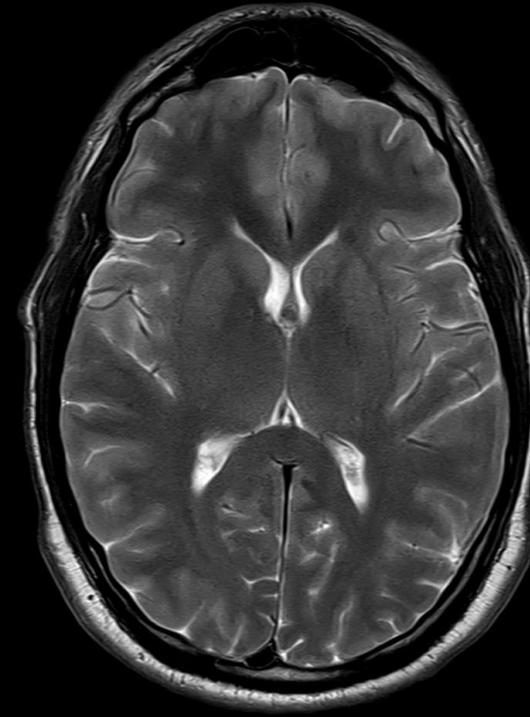
Our **Deep Resolve** applications enable MR acquisitions faster than ever before, from head to toe. The combinability with other acceleration techniques brings MR productivity to a new level.

<sup>1</sup> Deep Resolve Boost on MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# Deep Resolve Boost<sup>1</sup> High SNR and radically acceleration

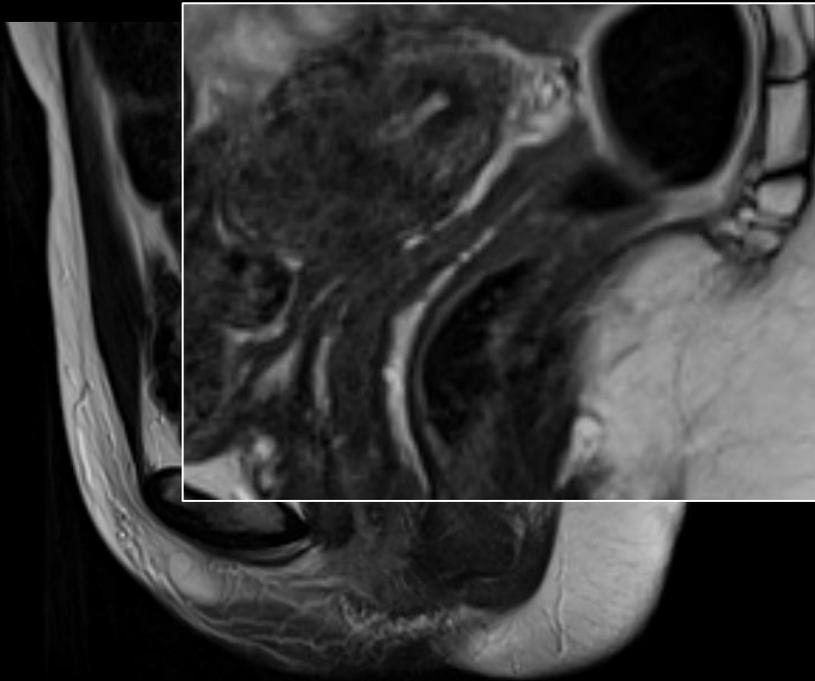


**Original:**  
T2 TSE, PAT 2, TA 0:52 min  
0.4 x 0.4 x 5.0 mm<sup>3</sup>



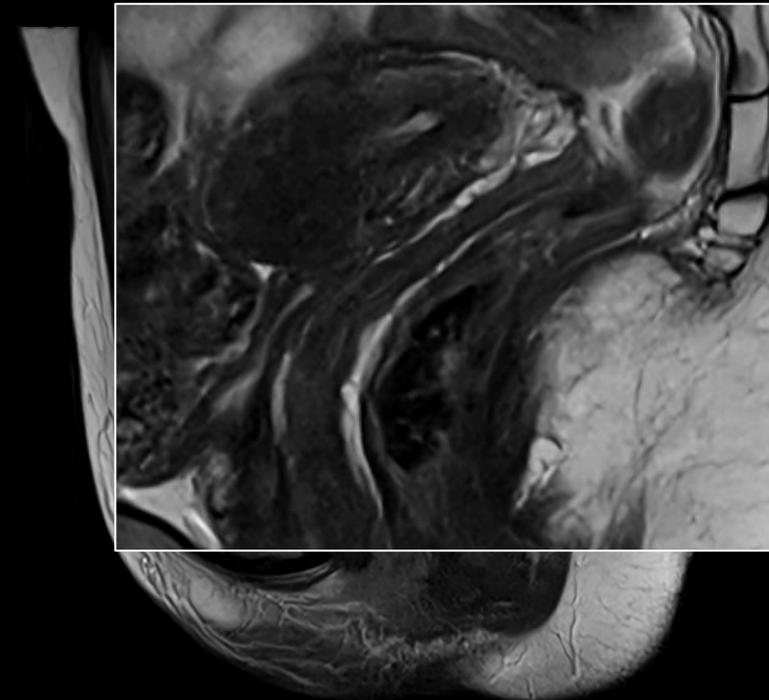
**Deep Resolve Boost<sup>1</sup> and Sharp:**  
T2 TSE, PAT 4, TA 0:26 min  
0.2 x 0.2 x 5.0 mm<sup>3</sup>

# Increase sharpness and speed of your body TSE acquisition with Deep Resolve Boost<sup>1</sup> and Sharp



**Original:**  
T2 TSE, PAT 2, TA 3:24 min  
0.8 x 0.8 x 4.0 mm<sup>3</sup>

72%  
faster



**Deep Resolve Boost<sup>1</sup> and Sharp:**  
T2 TSE, PAT 2, SMS2, TA 0:55 min  
0.4 x 0.4 x 4.0 mm<sup>3</sup>

# Deep Resolve Boost<sup>1</sup> and Sharp

## Our fastest spine exam just got faster



### Deep Resolve Boost<sup>1</sup> and Sharp:

T1 TSE, PAT 4, TA 2:02 min

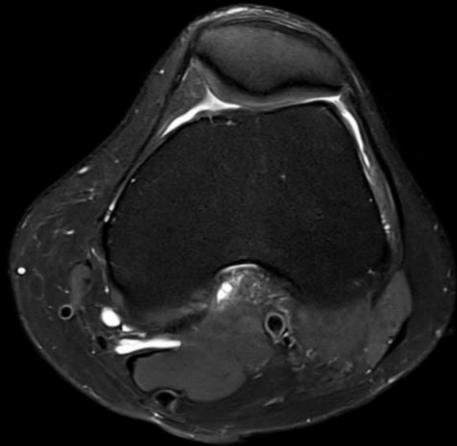
0.5 x 0.5 x 3.0 mm<sup>3</sup>

### Deep Resolve Boost<sup>1</sup> and Sharp:

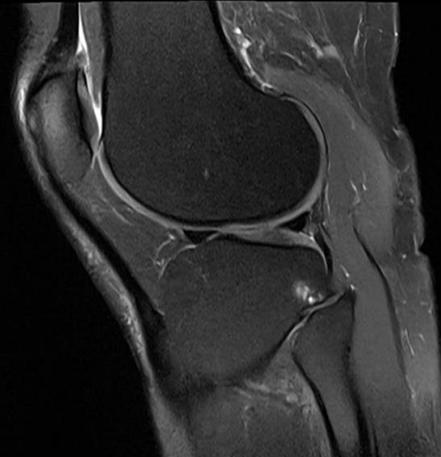
T2 TSE, PAT 4, TA 2:53 min

0.4 x 0.4 x 3.0 mm<sup>3</sup>

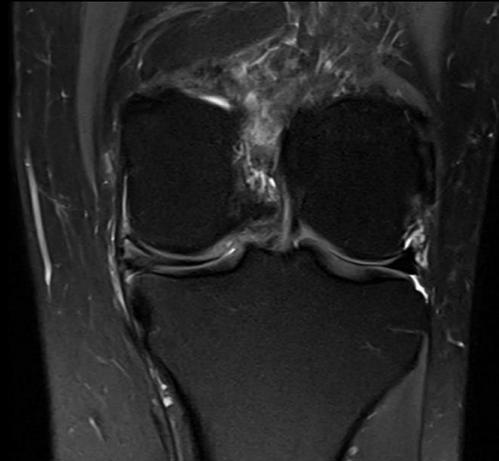
# Deep Resolve Boost<sup>1</sup> and SMS TSE – our fastest knee exam at 1.5T just got faster



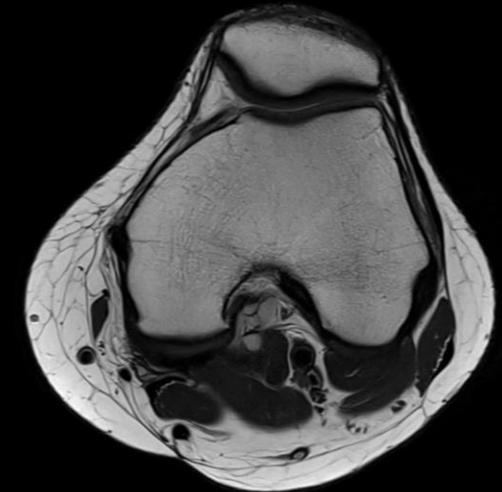
PD TSE fs  
PAT3 SMS2 DRB DRS  
0.3 x 0.3 x 3 mm<sup>3</sup>  
TA: 1:00 min



PD TSE fs  
PAT3 SMS2 DRB DRS  
0.3 x 0.3 x 3 mm<sup>3</sup>  
TA: 43 s



PD TSE fs  
PAT3 SMS2 DRB DRS  
0.3 x 0.3 x 3 mm<sup>3</sup>  
TA: 50 s



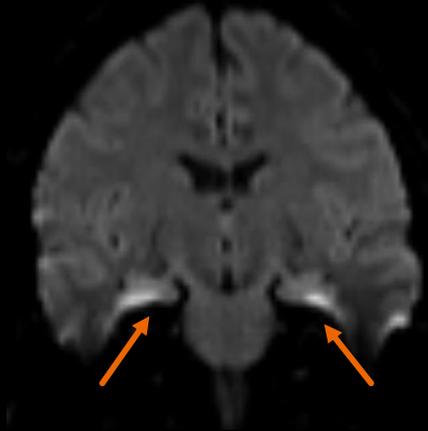
T1 TSE  
PAT3 SMS2 DRB DRS  
0.3 x 0.3 x 3 mm<sup>3</sup>  
TA: 36 s

**Total scan time: 3:09 min**

# Robust diffusion imaging for all clinical settings

## From single-shot EPI to BLADE diffusion<sup>1</sup>

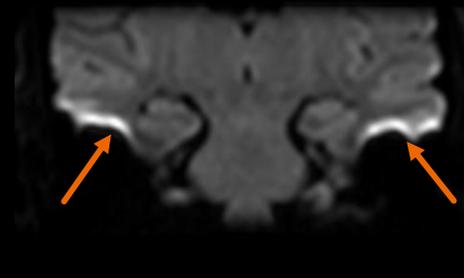
Single – shot EPI



PAT 2, SMS 2

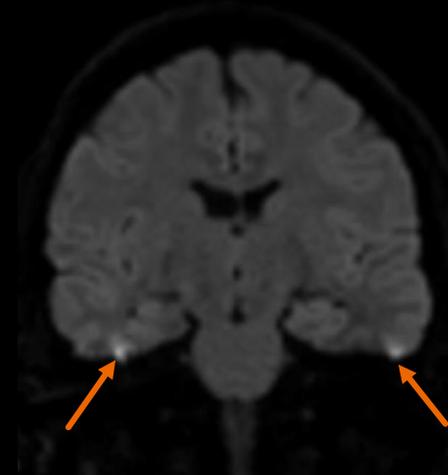
Matrix: 0.7 x 0.7 x 5 mm<sup>3</sup>

ZOOMit<sup>PRO</sup> Diffusion



Matrix: 0.9 x 0.9 x 5 mm<sup>3</sup>

RESOLVE



PAT 2

Matrix: 0.9 x 0.9 x 5 mm<sup>3</sup>

BLADE Diffusion



PAT 3

Matrix: 1.4 x 1.4 x 5 mm<sup>3</sup>

**Geometric distortion**

<sup>1</sup> Blade Diffusion on MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.  
Study-ID: 1aaaa3996

# Open Recon<sup>1</sup>

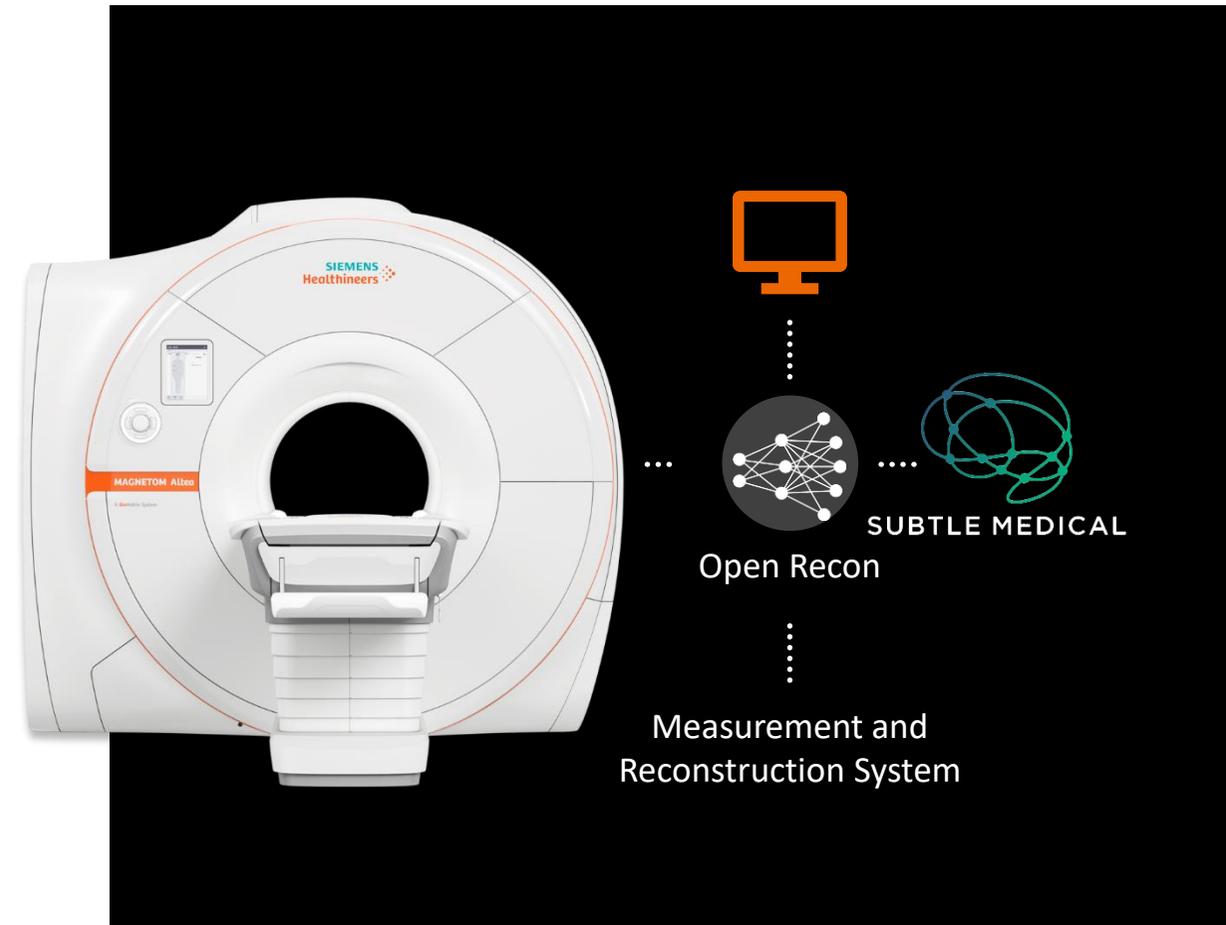
## SubtleMR – Our partner for many sequences

**First partner** we welcome on board our Open Recon interface

**Seamlessly integrated** in the reconstruction pipeline

Offers **DL postprocessing** for denoising and **increased sharpness** for almost all sequences

Our solution for customers who want a **“broadband”** – **DLR approach**



<sup>1</sup> Open Recon on MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

Scanning may only take up

**50%**

of the entire patient time slot!<sup>1</sup>



<sup>1</sup> Data on file.

# Our portfolio optimizes the productivity along the entire workflow with BioMatrix and the *syngo* MR XA-line

..... Patient preparation .....> ..... Image acquisition .....> ..... Post-processing .....

## Dockable Table



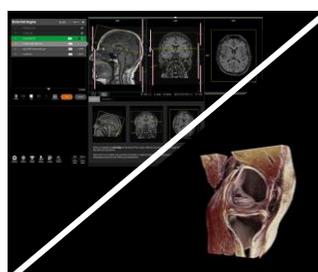
**Fast & effortless**  
patient transport

## Select&GO



**30% faster<sup>1</sup>**  
patient  
positioning

## myExam Companion<sup>4</sup> New



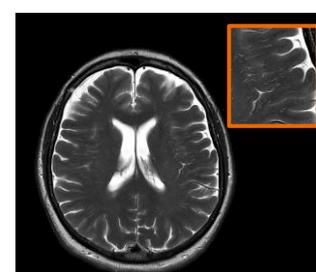
**Push-button**  
planning  
& scanning

## Turbo Suite



**Up to 50% time**  
**savings<sup>1</sup>**  
with SMS and CS

## Deep Resolve New



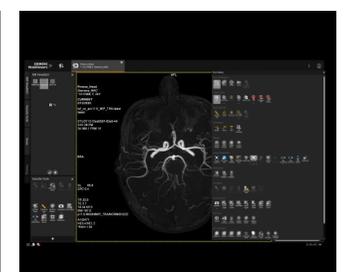
**Sharper images,**  
**faster**  
with deep  
learning-based  
recon

## Recon&GO



**Zero click**  
fully automated  
inline processing

## View&GO



**Ready-to-read**  
**results**  
with post-pro-  
cessing at the  
scanner & auto-  
distribution



Based on robust image quality with BioMatrix Tuners and Sensors

Consistency across fleet with the MR Protocols Module in teamplay<sup>2</sup> and *syngo* Virtual Cockpit<sup>3</sup>

<sup>1</sup> Data on file.

<sup>2</sup> teamplay is not commercially available in all countries. If its services are not marketed in countries due to regulatory or other reasons, the service offering cannot be guaranteed.

<sup>3</sup> *syngo* Virtual Cockpit is not yet commercially available in all countries. Its future availability cannot be guaranteed. Prerequisite: Expert-i-enabled modality from Siemens Healthineers.

<sup>4</sup> myExam Companion is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# myExam Companion<sup>1</sup>

## Intelligence that works with you

**Consistency**  
during patient preparation



.....  
**myExam 3D Camera**  
.....

**Automation**  
with built-in intelligence



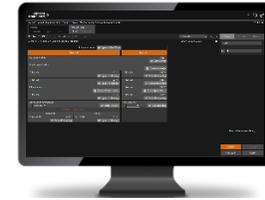
.....  
**myExam Autopilot**  
.....

**Assistance**  
for efficiency and consistency



.....  
**myExam Assist**  
.....

**Flexibility**  
according to your needs



.....  
**myExam Cockpit**  
.....

**myExam Companion**

.....  
**Consistent high quality results – no matter who operates the scanner**  
.....

<sup>1</sup> myExam Companion is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.



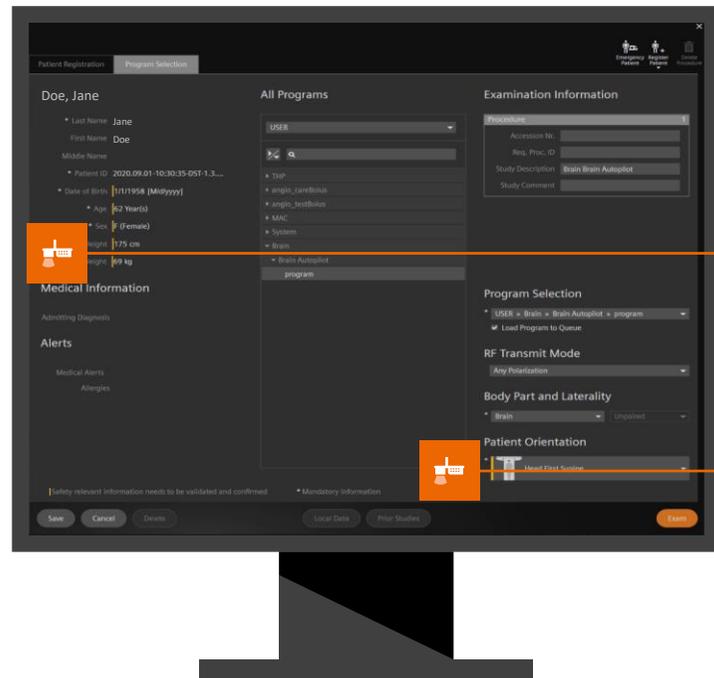
# myExam 3D Camera<sup>1</sup>

**Intelligence that works  
with you during patient  
preparation**

<sup>1</sup> myExam 3D Camera for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# Extended AutoPositioning and streamlined patient registration with myExam 3D Camera<sup>1</sup>

## AutoRegistration

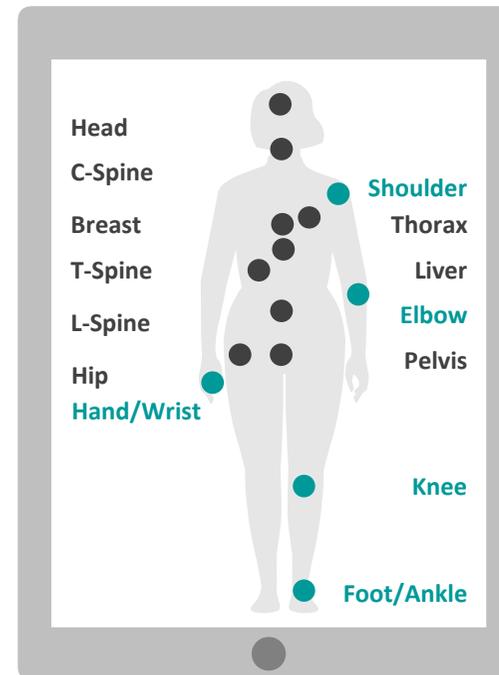


Capture:

Height  
Weight

Direction

## AutoPositioning



● Body regions supported by AI Bodymodel

● Body regions enhanced by myExam 3D Camera

<sup>1</sup>myExam 3D Camera for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# Discover the myExam 3D Camera<sup>1</sup>



<sup>1</sup>myExam 3D Camera for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

For consistent results –  
no matter the user, patient, or  
workload

# myExam Autopilot<sup>1</sup>

Powered by  
Artificial Intelligence



<sup>1</sup> myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# Automate intelligently with myExam Autopilot<sup>1</sup>

## Push-button operation

Scan at high quality with just a simple click



## Automated scan protocols

AI aids in standardizing scan volume positioning, tilting and coverage



## Inline reconstruction and easy export

Distribute results efficiently with automatic export or print



<sup>1</sup> myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

## myExam Autopilot<sup>2</sup> for brain, knee

>40%<sup>2</sup>



of all MRI exams can be  
**automated intelligently**

## myExam Assist<sup>3</sup> for a large range of anatomical regions

90%<sup>2</sup>



of all MRI exams can be  
**guided**

<sup>1</sup> myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

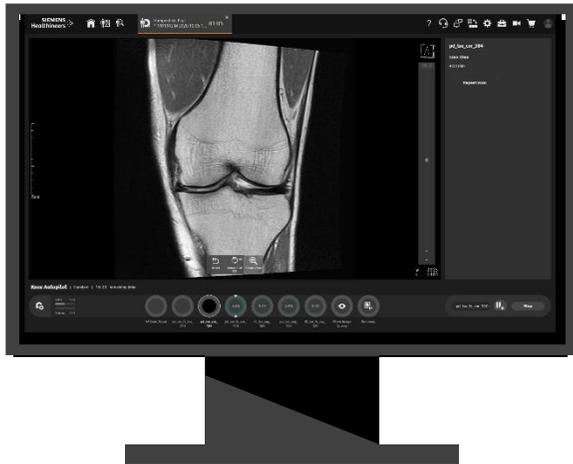
<sup>2</sup> Data on file.

<sup>3</sup> For MAGNETOM Sola this term will only be used starting with SW version *syngo* MR XA51A which is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# myExam Companion<sup>1</sup>

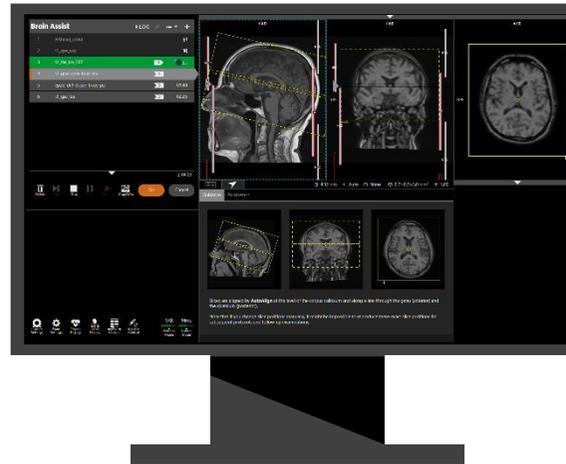
Different modes. Different use cases. Same IQ.

## NEW myExam Autopilot



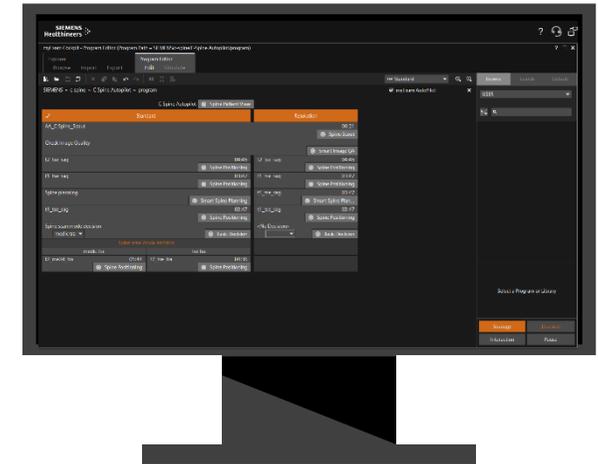
Automate intelligently

## myExam Assist<sup>2</sup>



Flexible and guided

## myExam Cockpit



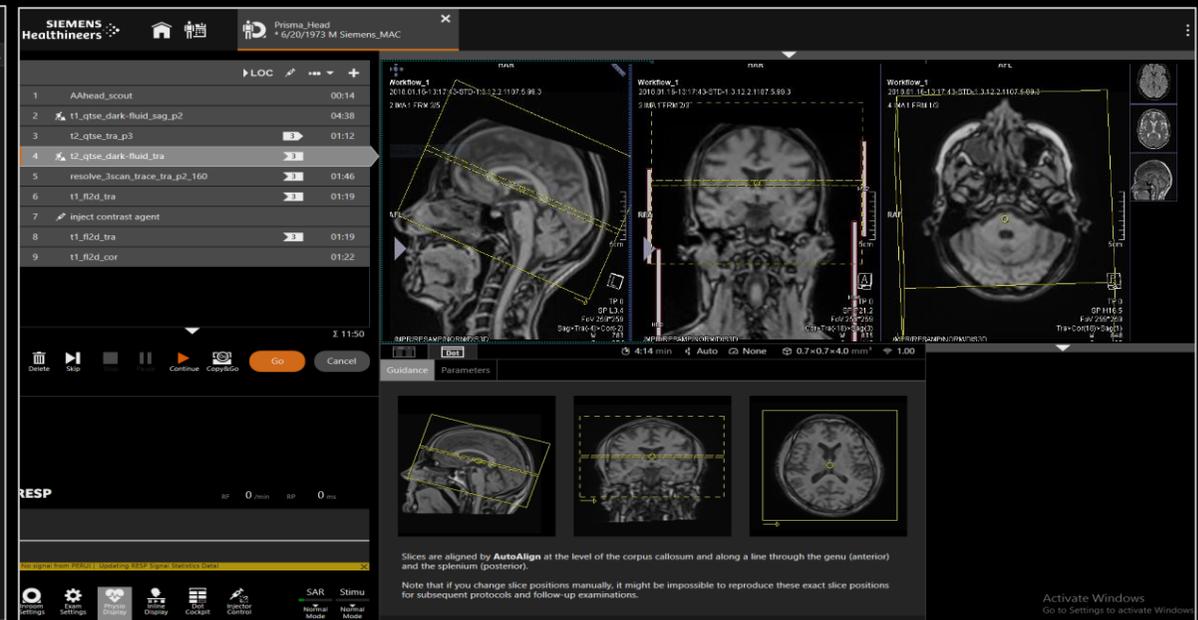
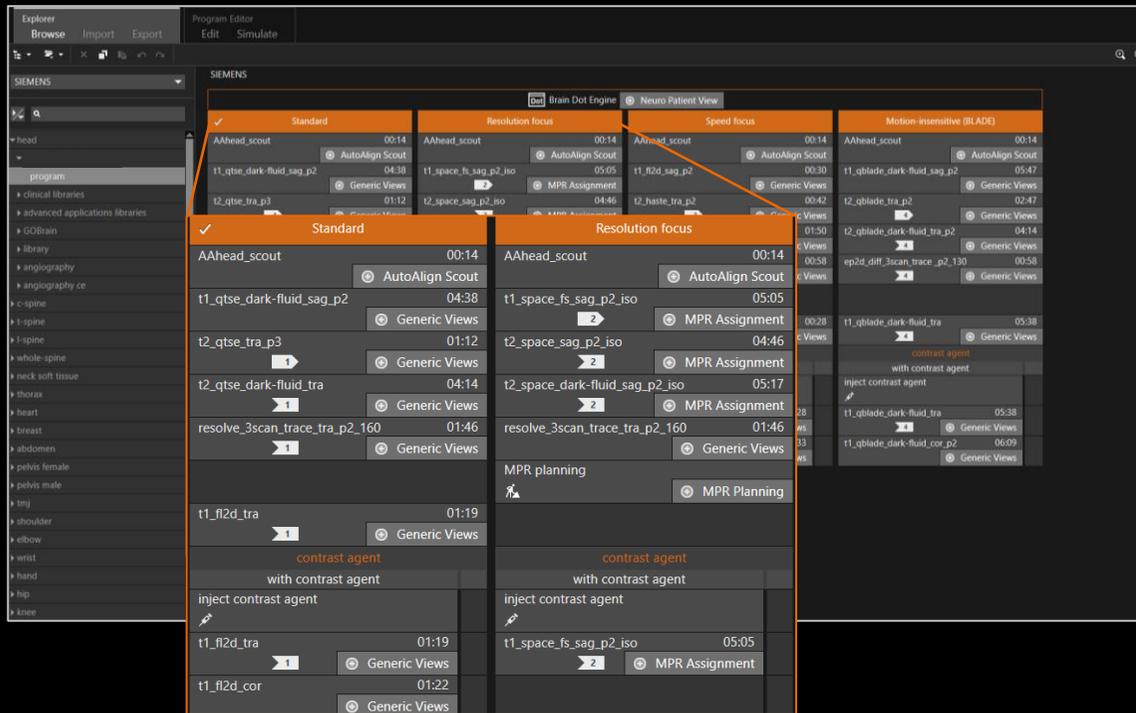
Customize intuitively

Tailored user assistance enabling consistent results

<sup>1</sup> myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

<sup>2</sup> For MAGNETOM Sola this term will only be used starting with SW version *syngo* MR XA51A which pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# myExam Assist<sup>1</sup> & Cockpit<sup>1</sup> – our unique exam software to standardize clinical and research quality efficiently



## myExam Cockpit

Central exam user interface for intuitive protocol configuration and management

## myExam Assist

Dedicated workflow packages for efficient and guided scanning

myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

<sup>1</sup> For MAGNETOM Sola this term will only be used starting with SW version syngo MR XA51A which is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# myExam Assist<sup>1</sup> with MAGNETOM Sola

## Standardized results every time



Over 90%<sup>2</sup> of MRI exam requests covered by myExam Assist.



Acquisition

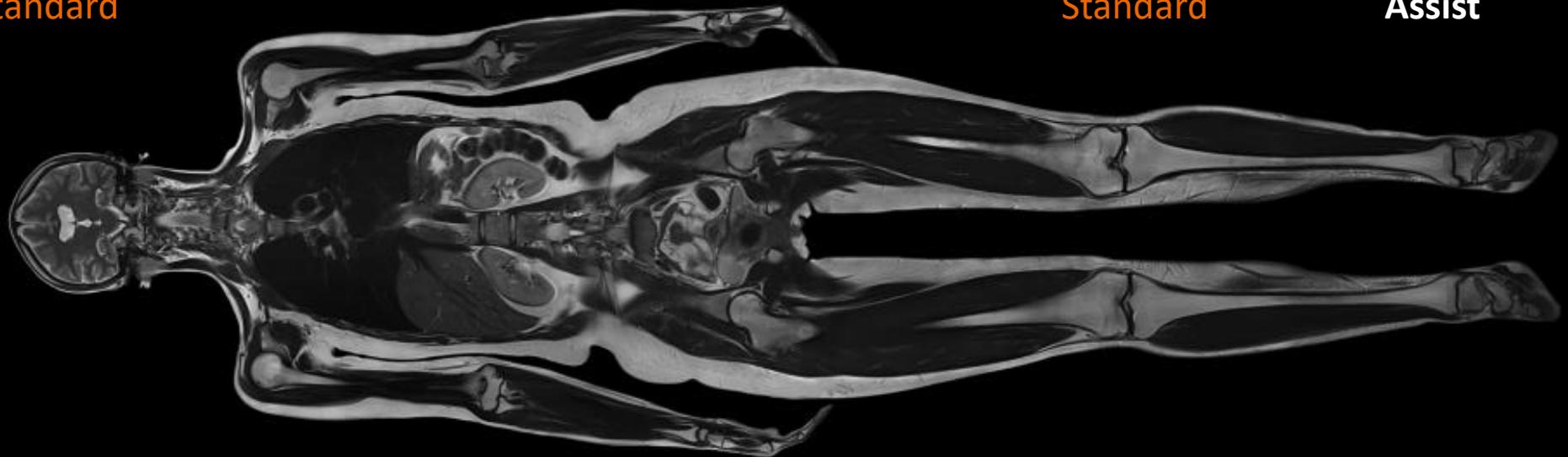
myExam Brain Assist  
Standard

myExam Cardiac Assist

myExam Abdomen Assist

myExam Large Joint Assist  
Standard

myExam Whole-Body Assist



myExam Breast Assist

myExam LiverLab Assist

myExam Prostate Assist

myExam Spine Assist  
Standard

myExam Angio Assist

myExam RT Assist

myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.  
<sup>1</sup> For MAGNETOM Sola this term will only be used starting with SW version *syngo* MR XA51A which is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed. <sup>2</sup> Evaluation of 9 million Siemens MR exams, 2014.

# myExam Assist<sup>1</sup>

## Scan automation that ensures reproducible results

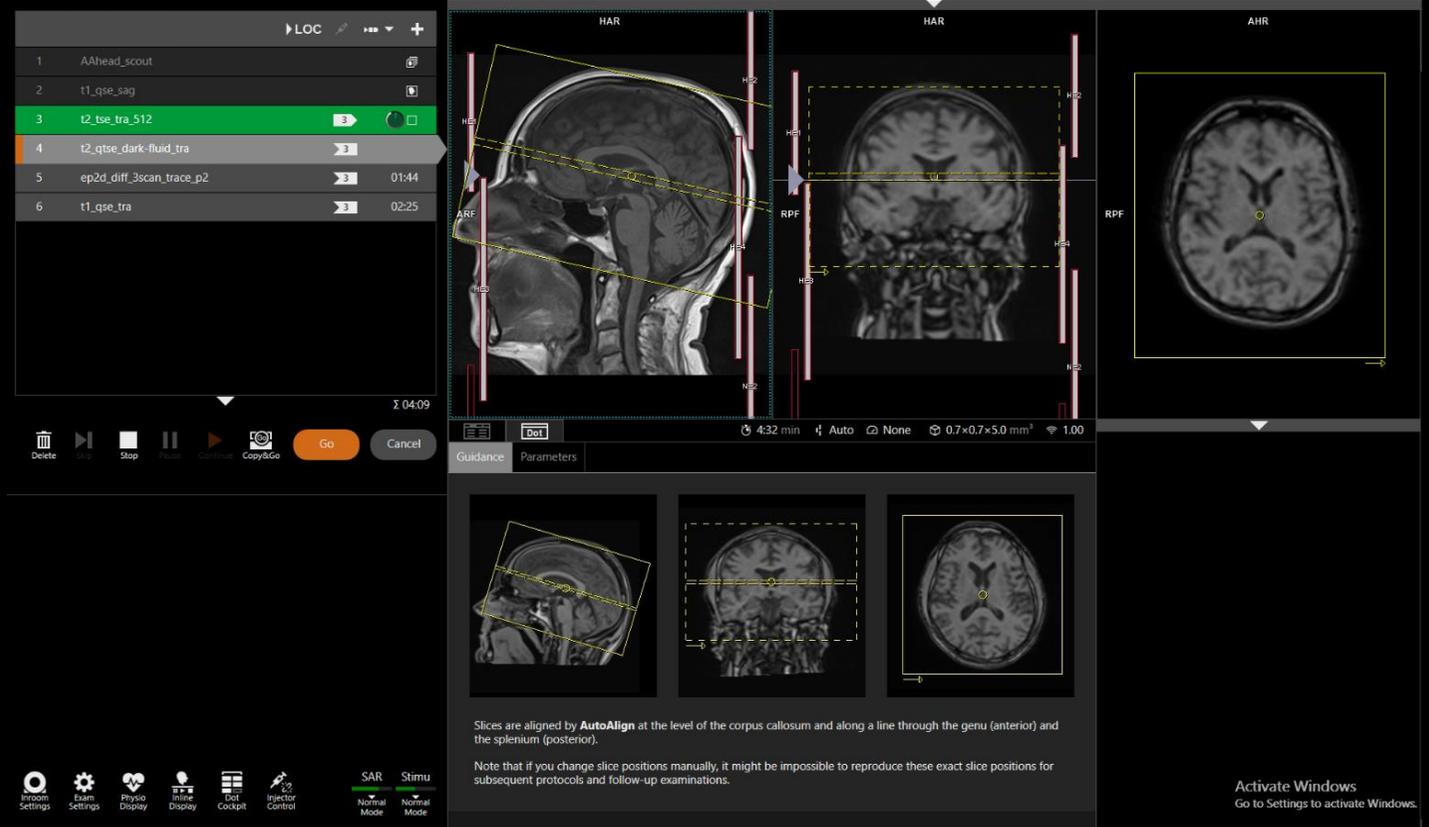
Standardized scan procedures  
for all major exams

Tailored **scan strategies**  
to adapt to patient's capabilities

**Comprehensive automation**  
to ensure reproducibility

**Adjustable scan parameters**  
can be limited to ensure consistency of results

Powered by  
Artificial Intelligence



myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

<sup>1</sup> For MAGNETOM Sola this term will only be used starting with SW version syngo MR XA51A which is pending 510(k) clearance and is not yet commercially available in the United States.

Its future availability cannot be guaranteed.

# myExam Assist<sup>1</sup>

## Scan automation for reproducible results

Powered by Artificial Intelligence

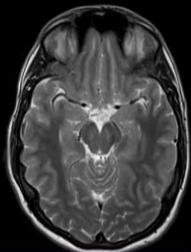
### Patient 1



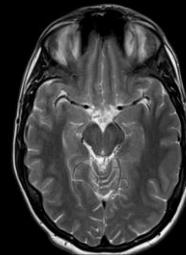
### Patient 2



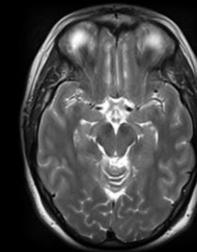
### Initial exam



### Follow-up



### Kyphotic patient

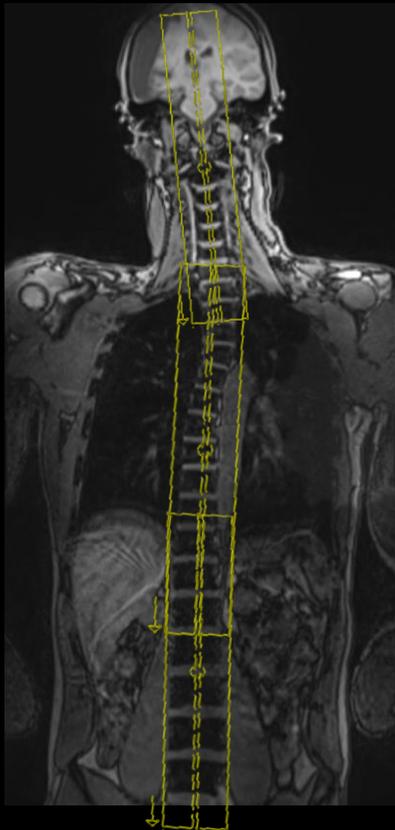


myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.  
<sup>1</sup> For MAGNETOM Sola this term will only be used starting with SW version syngo MR XA51A which is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# myExam Assist<sup>1</sup>: AutoAlign

## Consistently ensuring the right scan orientations

1. Automated alignment to anatomy enables consistency



2. Push-button snap-to-disk positioning of axial scans



Powered by  
Artificial Intelligence



## AI-based technologies for consistent image quality

Increase efficiency in exam planning

myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

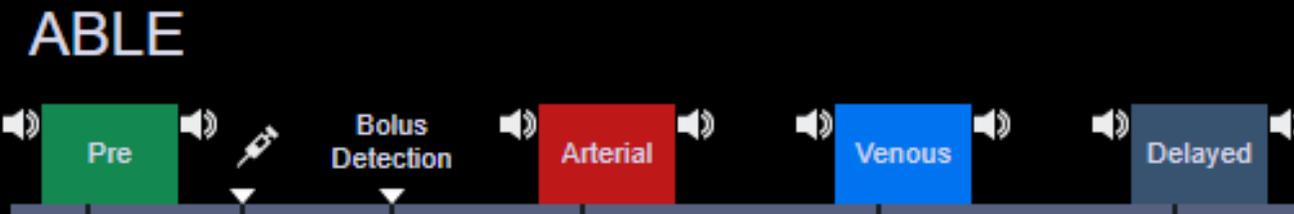
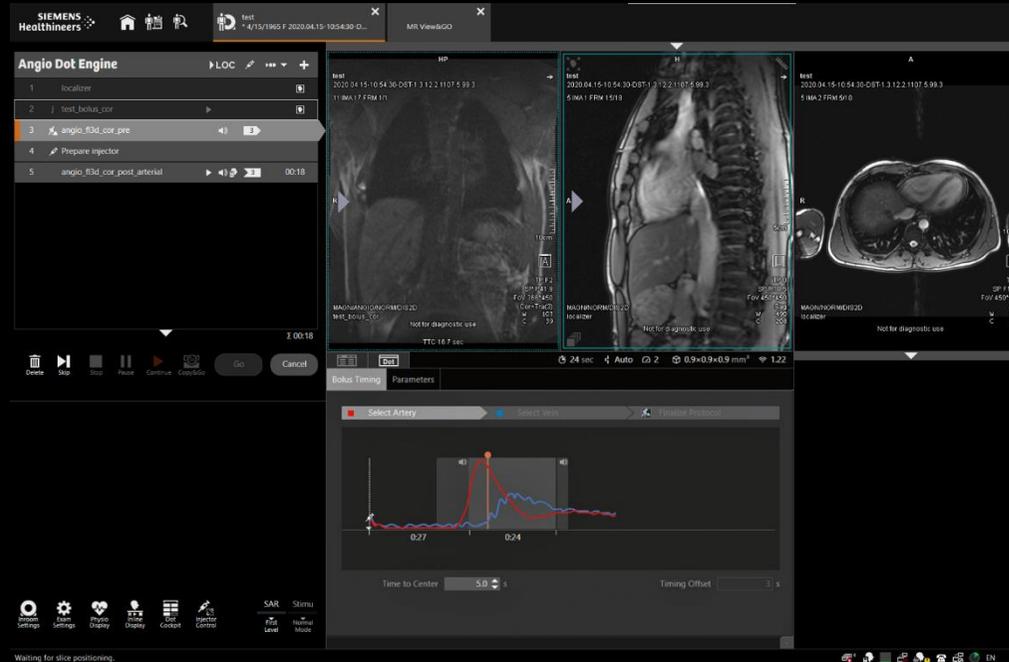
<sup>1</sup> For MAGNETOM Sola this term will only be used starting with SW version syngo MR XA51A which is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# myExam Assist<sup>1</sup>: AutoBolus

## Consistently ensuring the right contrast timing

Improve diagnostic results through consistent contrast timing

Avoid patient recalls with more accurate contrast timing



myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

<sup>1</sup> For MAGNETOM Sola this term will only be used starting with SW version syngo MR XA51A which is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# myExam Assist<sup>1</sup>

## Comprehensive scan automation to ensure reproducibility

**AutoAlign, AutoCoverage and AutoFoV**  
for consistent coverage

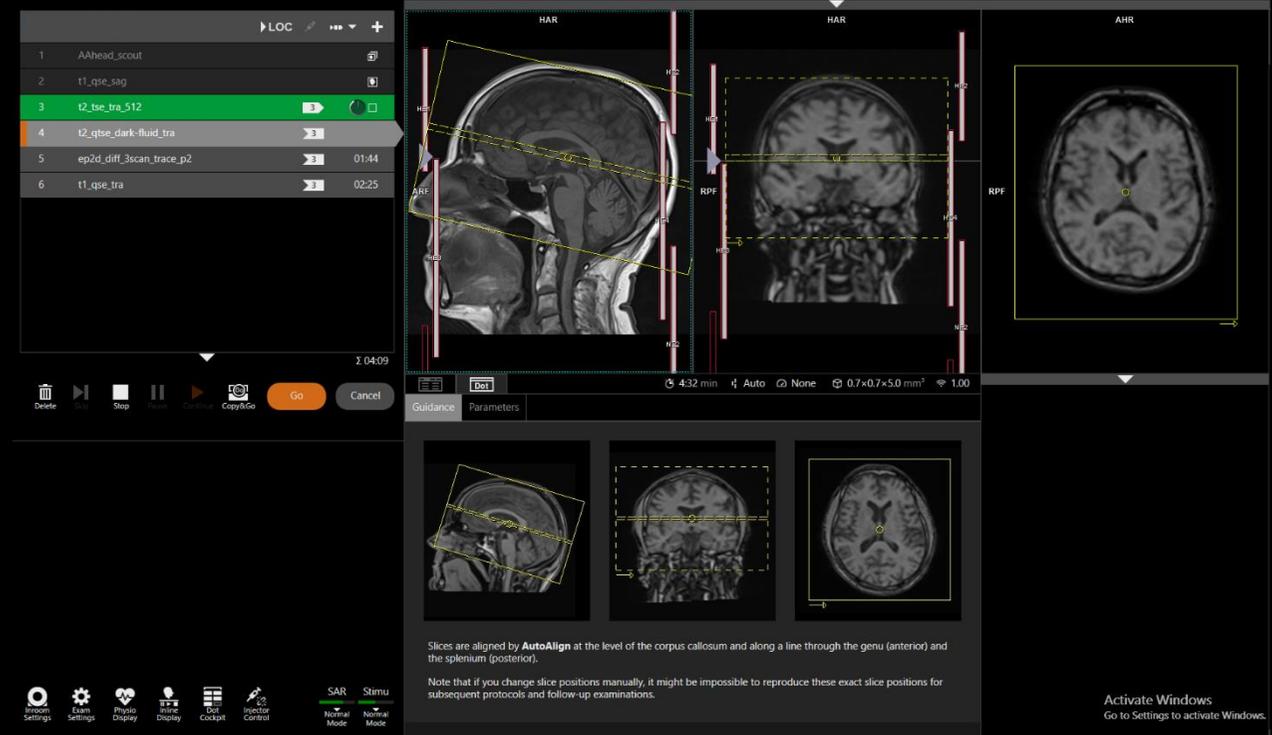
**AutoBolus Detection**  
for consistent timing in dynamic imaging

**AutoVoice Commands**  
in multiple languages for instructions

**MPR Assignment**  
for consistent reconstructions in 3D imaging

**myExam Decisions**  
for consistent clinical adaptations to the exam

Powered by  
Artificial Intelligence



myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

<sup>1</sup> For MAGNETOM Sola this term will only be used starting with SW version *syngo* MR XA51A which is pending 510(k) clearance and is not yet commercially available in the United States.

Its future availability cannot be guaranteed.

# myExam Whole Body Assist<sup>1</sup> – highest consistency for follow-up examinations and response assessment



## Easy, push-button workflow with myExam Whole-Body Assist

### General Parameters

Exam Strategy: Standard

Focus Adaptation: BH + AutoCovera...

Auto Bolus Detection:

Auto ROI:

### Breath-Hold Parameters

Breath-Hold Capability: 15 s

Auto Breath-Hold Commands:  English (United...)

Pause Between Breath-Holds: 10 s

### Coverage

Head	
Thorax	Focus
Abdomen	Focus
Pelvis	Focus
Legs	FastView

Planning of a whole body exam can be reduced from 14 minutes to only 2.5 minutes<sup>2</sup> (= 8% of the exam time)

myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

<sup>1</sup> For MAGNETOM Sola this term will only be used starting with SW version syngo MR XA51A which is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed. <sup>2</sup> Stocker D, et al. Performance of an Automated Versus a Manual Whole-Body Magnetic Resonance Imaging Workflow. Invest Radiol. 2018, doi: 10.1097/RLI.000000000000047

# GO technologies

Automate your  
MR workflow



# Optimized workflow powered by BioMatrix and GO Technologies



Position your patient in less than **one minute**<sup>1</sup> with **Select&GO**



**DotGO & Recon&GO** – Push-button exam and ready-to-read results



With **View&GO**, distribute all necessary results immediately and without any delay

<sup>1</sup> Data on file.

# Acquisition with DotGO for push-button whole-spine exams – even for challenging anatomies



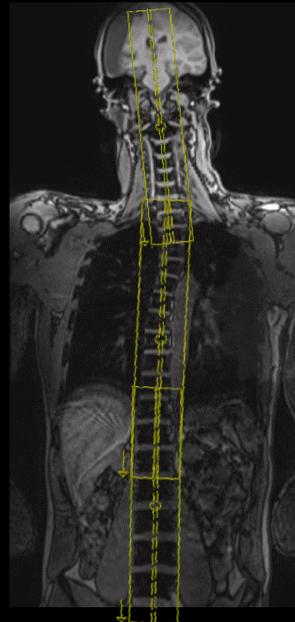
**AI-based technologies for consistent image quality**

**Increase efficiency in exam planning**

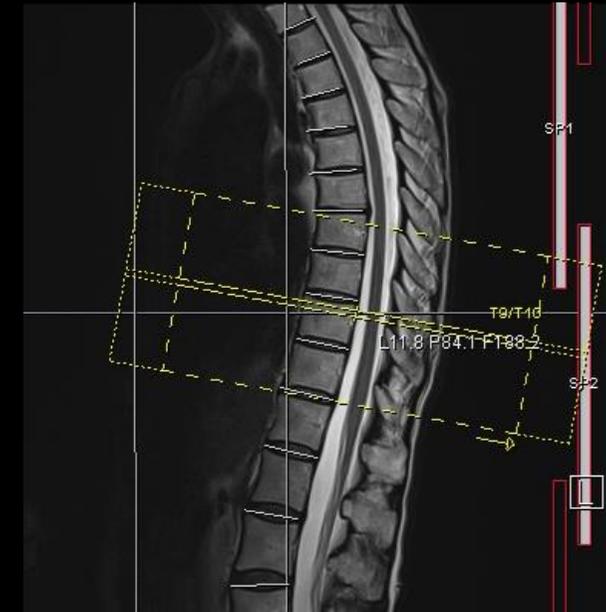


**Acquisition**

1. Automated alignment to anatomy enables consistency

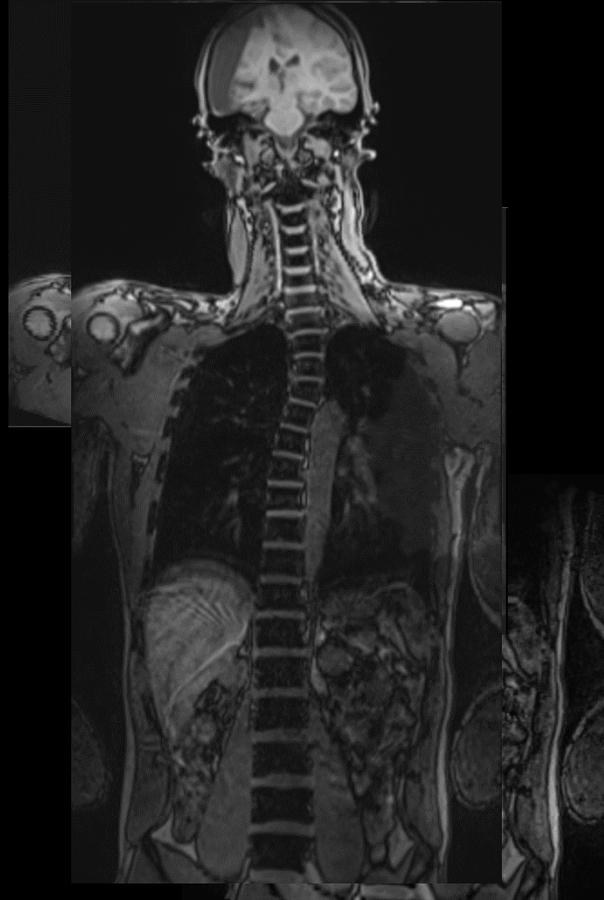


2. Push-button snap-to-disk positioning of axial scans



# Ready-to-read results with Recon&GO

## Save time and reduce errors



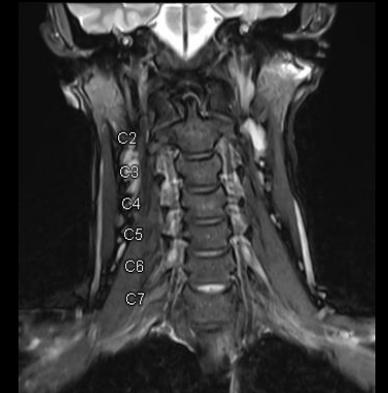
Automatic  
composing of  
whole-spine  
exams



Automatic  
spine labeling  
in all contrasts,  
slices and  
orientations



Reconstruction



# Quality check and distribution of “ready-to-read” results

## MR View&GO

### Standard Features

- Time Curve
- Subtraction
- MIP & MPR generation
- Composing
- Data distribution

### Benefit

- ONE workflow for quality check, processing and distribution of images
- Available on second monitor for optimized workflow

The screenshot displays the Siemens MR View&GO software interface. The main window shows a brain MRI scan in the Axial (AFL) plane. The interface includes several panels and toolbars:

- Viewing Layouts:** A panel on the left showing different view configurations (Stack 3x2, Stack 2x2, Stack 5x4).
- User-defined Favorite Tools:** A panel on the left containing various tool icons such as 3D Ref. Point, Distance Line, Position Displa..., Snapshot, Print Stack, Flip Horizontal, Save as Series, Mosaic, and Subtract...
- Extended Tools Gallery:** A panel on the right containing a comprehensive set of tools categorized into:
  - New Interactions
  - Display Types
  - Measurements (Distance, Angle, Point Line, ROI, etc.)
  - Annotations (Marker, Arrow, Text, Callout)
  - Ranges (Raster, Color Range, Solid, Curved)
  - Wedge Visualization (Fit, Fit Axis, Size, Graphics, etc.)
  - Workflows (Measure, Window, etc.)
  - 3D Editing (Fit, Rotate, Translate, etc.)
  - Print & Export (Snapshot, Print, Save as Image, etc.)
  - MR Tools (Mosaic, New Composite, Position Display, etc.)
  - MR Calculation (Subtract, Add, Multiple, etc.)
- Central Panel:** Displays patient information (Brain Dot, Siemens\_MAC, F, 24Y), current date (2/12/2020), study ID (f2ed5587-62e5-49), and acquisition parameters (RFA, SL 65.6, SPC 0.4, TR 20.9, TE 3.7, TA 34.53\*3, BW 167.0, p11.5 MAGN/MIP\_TRA/NORM/DIS2D, A1/SAT1, HE3.4;NE1.2, \*R3d1r / 20).



### Extended Tools Gallery

The Extended Tools Gallery provides a comprehensive set of tools for MR image processing and analysis, organized into several categories:

- New Interactions:** Tools for interacting with the image data.
- Display Types:** Tools for changing the display mode of the image.
- Measurements:** Tools for measuring distances, angles, and volumes.
- Annotations:** Tools for adding markers, arrows, and text to the image.
- Ranges:** Tools for defining and applying color and intensity ranges.
- Wedge Visualization:** Tools for visualizing and adjusting wedges.
- Workflows:** Tools for saving and executing predefined workflows.
- 3D Editing:** Tools for manipulating 3D volumes.
- Print & Export:** Tools for saving and printing images.
- MR Tools:** Tools for advanced MR image processing.
- MR Calculation:** Tools for performing mathematical operations on MR data.

# High efficiency throughout the entire patient workflow – AI powered push-button exams

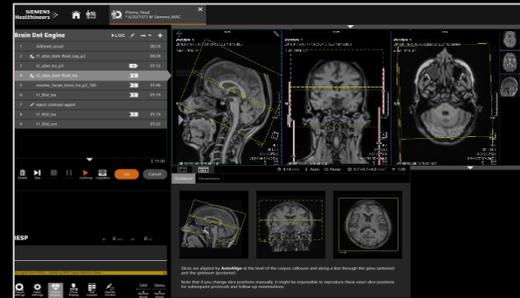
Powered by Artificial Intelligence 

Faster and consistent patient positioning and registration



Select&GO and myExam 3D Camera<sup>2</sup>

Push-button planning & scanning



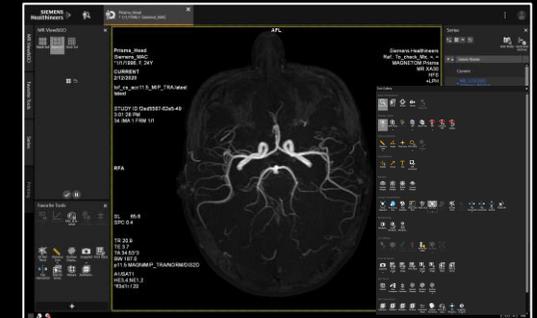
myExam Assist<sup>3</sup> & Autopilot<sup>2</sup>

Zero click fully automated inline processing



Recon&GO

Ready-to-read results with post-processing at the scanner



View&GO

<sup>1</sup> Data on file.

<sup>2</sup> myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

<sup>3</sup> For MAGNETOM Sola this term will only be used starting with SW version *syngo* MR XA51A which is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# 5-6 patients per hour with a 1.5T system

## Test proofs you increase productivity with leading technologies

2-hour stress test incl. patient preparation, acquisition, and changing time



Turbo Suite

1<sup>st</sup> hour:



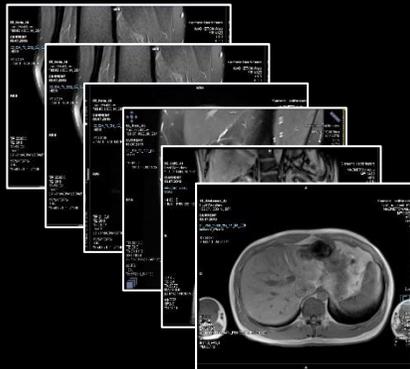
3 Routine 2D knees, 5 sequences  
GRAPPA and SMS allowed TA: 4:43 min

1 high resolution knee protocol, 7 sequences  
GRAPPA, SMS, CAIPIRINHA allowed TA: 21:12 min

1 routine lumbar spine, 5 sequences  
GRAPPA allowed TA: 6:44 min

1 routine lumbar spine, 5 sequences with WS localizer  
GRAPPA allowed TA: 13:37 min

2<sup>nd</sup> hour:

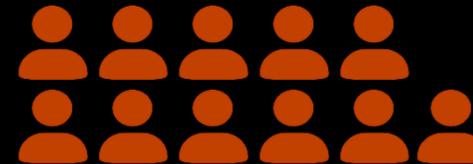


1 routine head, 6 sequences with angiography  
GRAPPA and CS allowed 8:32 min

2 routine C-spine, 5 sequences  
GRAPPA allowed 8:15 and 7:48 min

1 routine head, 5 sequences  
GRAPPA allowed 5:55 min

1 routine abdomen, 7 sequences  
GRAPPA, CS, CAIPIRINHA allowed 8:17 min



11 patients



Scan time:  
**1 hour 34 min<sup>1</sup>**



Patient preparation,  
positioning  
and changing:  
**26 min**

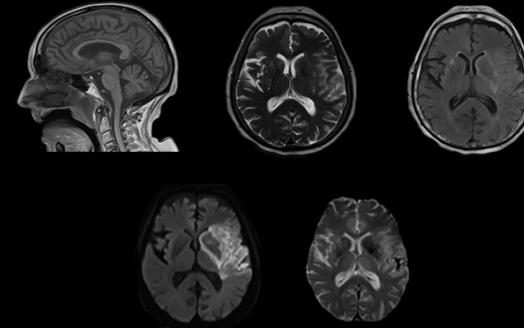
<sup>1</sup> Includes also time for shimming. Data on file.

# Fast, push-button diagnostic exams

## Clinically validated GO Protocols supported by DotGO

### GOBrain / GOBrain+

Push button, diagnostic brain exam in 5 minutes



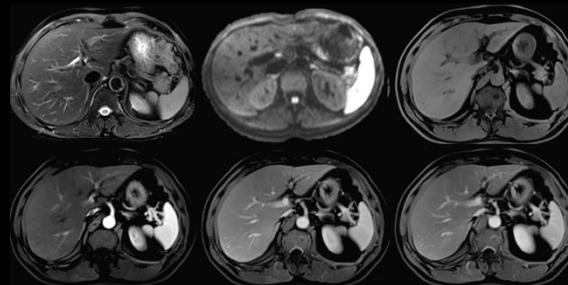
### GOKnee3D

Push button, high-resolution 3D knee exam in 10 minutes



### GOLiver

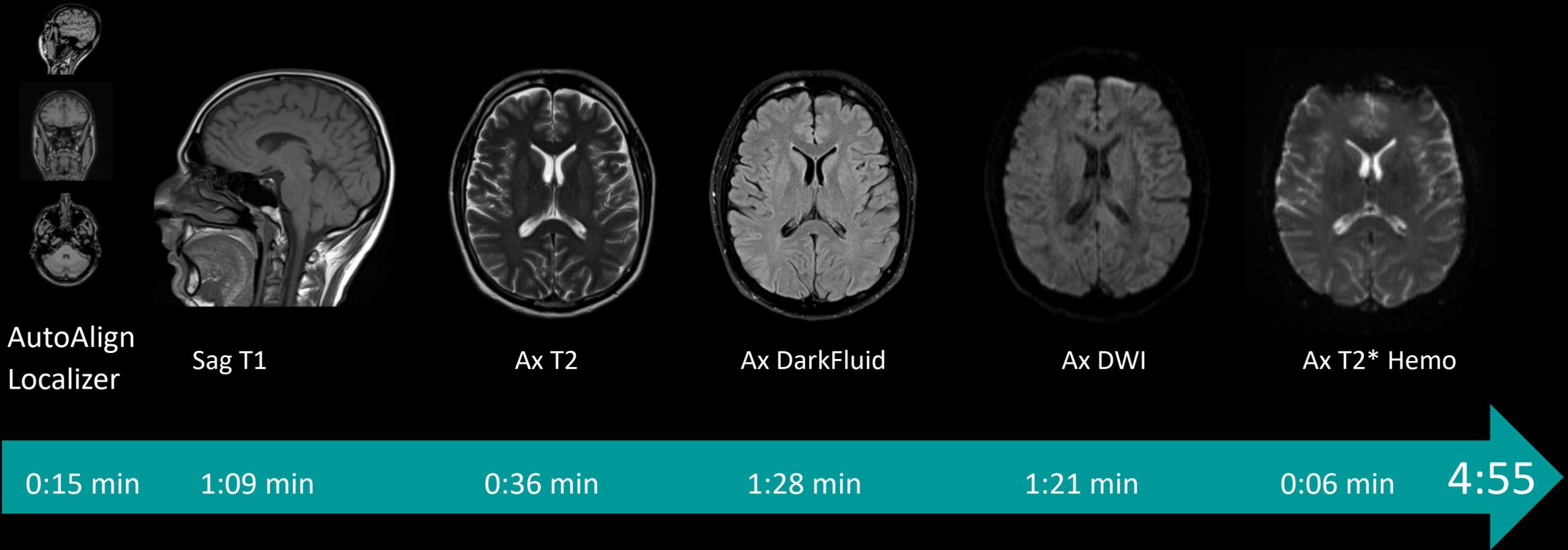
Fast, push-button diagnostic abdominal exams in just 12 minutes



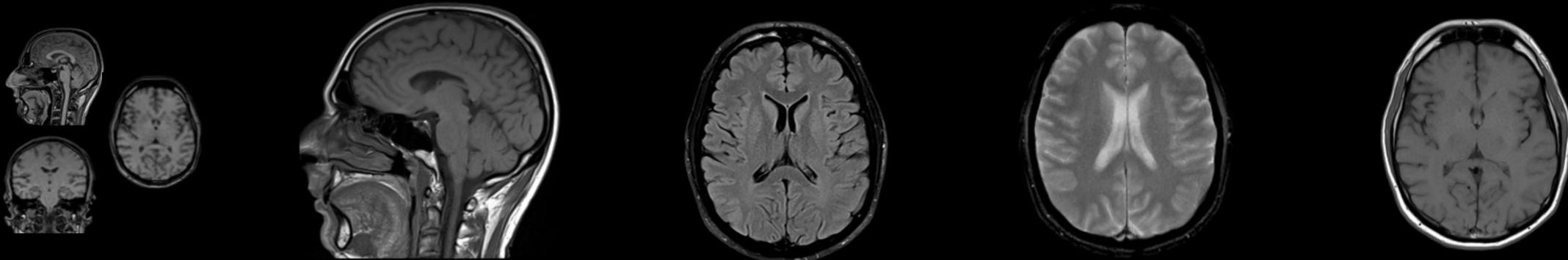
# GOBrain

## A new, faster standard in brain examinations

GOBrain push-button brain exam in less than **5 minutes**



# GOBrain+ – Clinically validated, push-button brain exam in less than 14 minutes



AutoAlign 15s

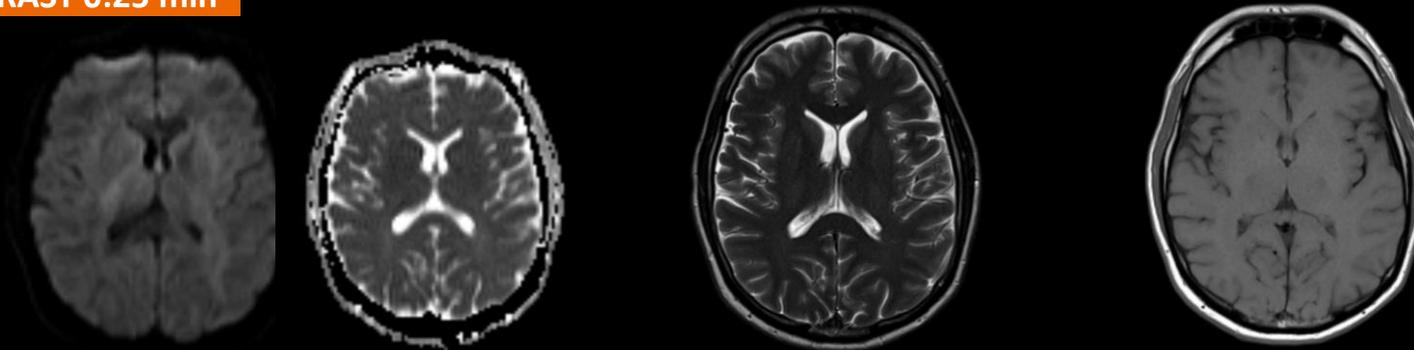
Sag T1 1:12 min

Ax DarkFluid 1:28 min

Ax T2\* 1:42 min

Ax T1 1:10 min

**CONTRAST 0:25 min**



Ax DWI & ADC 1:10 min

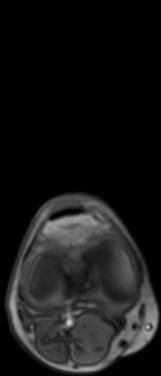
Ax T2 0:48 min

Ax T1 1:10 min

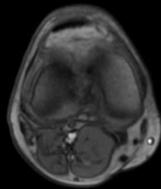
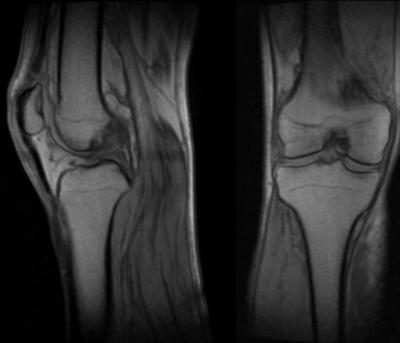
T1 MPRAGE 3:55 min

**GOBrain+: 13:15 min**

# What can a 'standard' knee exam look like?



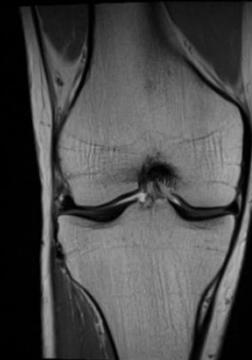
Localizer  
TA 8.1 s



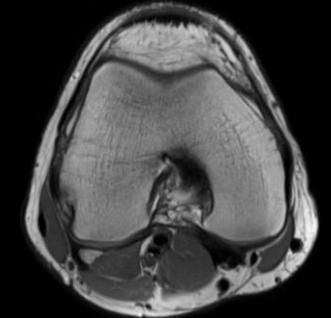
3-plane Localizer  
TA 14 s



PD TSE, Sagittal, TA 3:14 min  
0.4 x 0.4 x 3.0 mm<sup>3</sup>



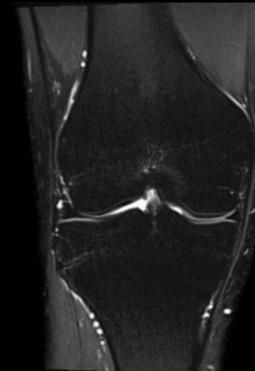
PD TSE, Coronal, TA 3:14 min  
0.4 x 0.4 x 3.0 mm<sup>3</sup>



PD TSE, Axial, TA 3:26 min  
0.4 x 0.4 x 3.0 mm<sup>3</sup>



T2 FS TSE, Sagittal, TA 3:02 min  
0.4 x 0.4 x 3.0 mm<sup>3</sup>



T2 FS TSE, Coronal, TA 2:57 min  
0.4 x 0.4 x 3.0 mm<sup>3</sup>



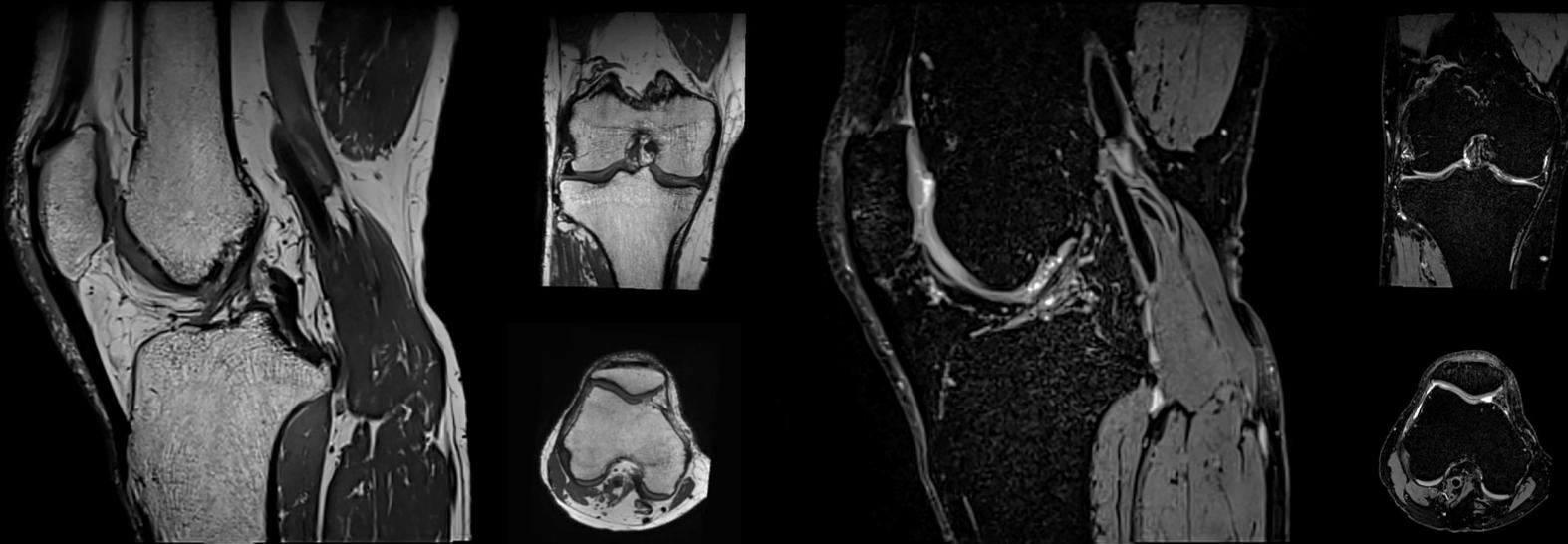
T2 FS TSE, Axial, TA 3:11 min  
0.4 x 0.4 x 3.0 mm<sup>3</sup>

A complete 2D examination with two contrasts  
and three planes can take

**19:26 min**

# GOKnee3D on MAGNETOM Sola

Push-button, high-resolution 3D exam in 10 minutes<sup>1,2,3</sup>



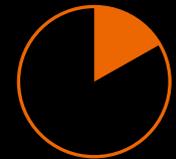
AutoAlign Localizer  
TA 0:13 min



IW/PD, 0.5 mm iso  
TA 4:31 min



IW/T2 FS, 0.6 mm iso  
TA 4:34 min



TA

9:18 min

<sup>1</sup> Fritz J et al. Three-dimensional CAIPIRINHA SPACE TSE for 5-minute high-resolution MRI of the knee. Invest Radiol 2016; 51(10): 666-676.

<sup>2</sup> Thawait GK. High resolution isotropic 3D CAIPIRINHA SPACE MRI of the musculoskeletal system. MAGNETOM Flash 2016, 66: 30-38.

<sup>3</sup> Del Grande F & Fritz J. GOKnee3D study. Unpublished data.

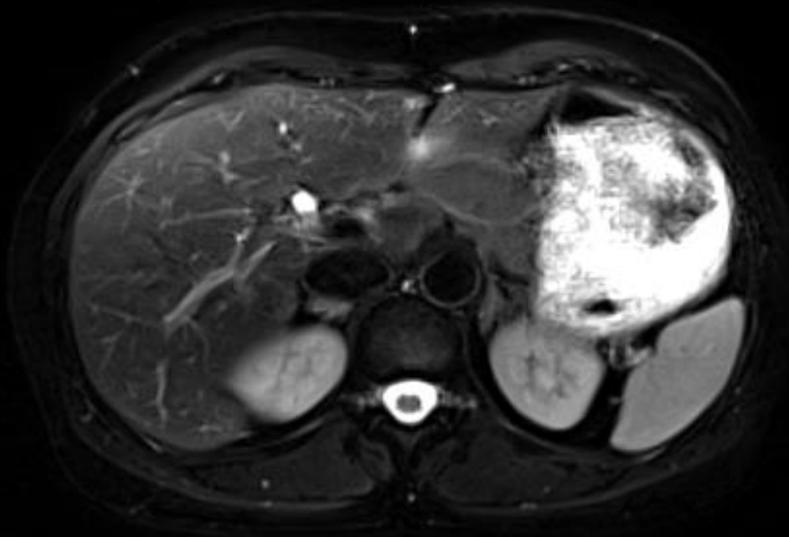
**Challenge: Abdominal MRI is a very frequently performed exam and substantially above the average in acquisition time**

**11.6%**

of all MR procedures<sup>1</sup>

**>25 min**

average abdominal scan time<sup>2</sup>



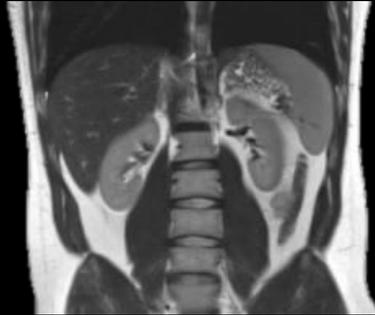
<sup>1</sup> Based on evaluation of 14,8 million reported exams on Siemens Aera and Skyra MRI systems in 2017.

<sup>2</sup> Based on the evaluation of average exam times by a big radiology chain in the U.S.

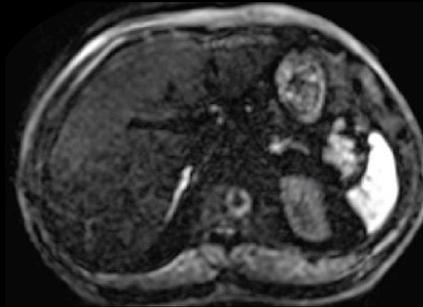
# Solution: GOLiver

## Fast, push-button diagnostic abdominal MRI

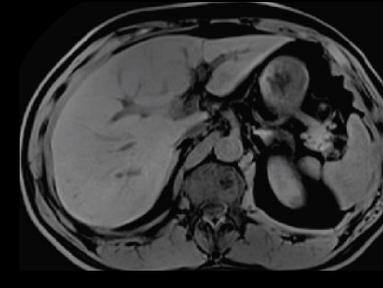
AutoAlign  
Localizer



Cor T2 HASTE



DWI b1000



pre contrast T1 W  
T1 in/opp phase

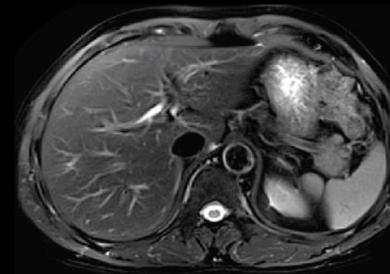


arterial T1

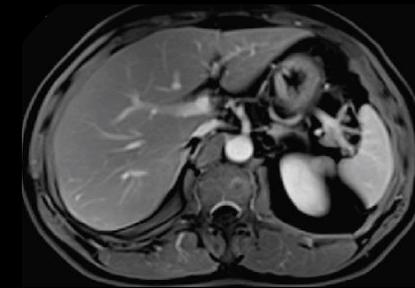
**12 minutes** - including planning, breath-holds, triggering, contrast application etc.



portalvenous T1



Ax T2 BLADE FS



delayed T1

# GOLiver – Clinically validated by Changhai Hospital on a number of clinical conditions

**Documented in 130 patients to assist in the diagnosis of multiple clinical conditions including:**

- Hepatocellular Carcinoma (HCC)
- Gallbladder cancer
- Pelvic masses
- Metastases of gastric carcinomas
- Pancreatic cancer
- Intestinal neoplasms
- Fatty liver disease
- Hepatic cirrhosis
- Hemangioma
- Metastases of breast cancer and others.

4446

## A clinically-validated, fast and semi-automated MR workflow for Liver Evaluation

Qingsong Yang<sup>1</sup>, Yukun Chen<sup>1</sup>, Caixia Fu<sup>2</sup>, Bernd Kuehn<sup>3</sup>, Berthold Kiefer<sup>3</sup>, Zhen Wang<sup>1</sup>, Xu Yan<sup>4</sup>, Chao Ma<sup>1</sup>, Dehe Weng<sup>2</sup>, Luguang Chen<sup>1</sup>, and Jianping Lu<sup>1</sup>

*<sup>1</sup>Department of Radiology, Changhai Hospital of Shanghai, the Second Military Medical University, Shanghai, People's Republic of China, <sup>2</sup>Application development, Siemens Shenzhen Magnetic Resonance Ltd., Shenzhen, People's Republic of China, <sup>3</sup>MR Applications Predevelopment, Siemens Healthcare, Erlangen, Germany, <sup>4</sup>MR Collaboration NE Asia, Siemens Healthcare, Shanghai, People's Republic of China*

### Synopsis

A fast and semi-automated MRI workflow for liver examinations with approximately 12mins of total examination time was proposed and evaluated with liver patients using CT or histo-pathology as reference. 28 patients suspected of liver disease were enrolled in this study. The results show a good concordance between findings on MRI and the chosen reference standard. This indicates that the proposed fast MRI workflow has the capability to be used for diagnostic purposes in clinical routine while being highly time efficient at the same time.

### Clinical Question

Is it possible to achieve CT-like fast & semi-automated MR contrast-enhanced liver exams without compromising diagnostic value?

### Impact

MR imaging of the liver is one of the most time-consuming MR examinations, with typical exam times of about 30minutes and more, and a lack of standardization. Patients typically undergoing liver MRI often are severely ill, have comorbidities and problems to lie still for long time. CT has the advantage of being much faster and normally takes ~10mins on-bed time for a liver examination. However, CT exposes the patient to radiation with associated risks and has been shown to be inferior to MRI in terms of characterizing soft

Anticipate motion for high-quality results &  
boost efficiency for patient preparation

# BioMatrix Sensors



# Motion can significantly decrease image quality and lead to costly rescans

~\$115k

in lost revenue,  
per scanner, per year<sup>1</sup>

## Toward Quantifying the Prevalence, Severity, and Cost Associated With Patient Motion During Clinical MR Examinations

Jalal B. Andre, MD<sup>a</sup>, Brian W. Bresnahan, PhD<sup>a</sup>, Mahmud Mossa-Basha, MD<sup>a</sup>, Michael N. Hoff, PhD<sup>a</sup>, C. Patrick Smith, BS<sup>b</sup>, Yoshimi Anzai, MD<sup>a</sup>, Wendy A. Cohen, MD<sup>a</sup>

### Abstract

**Purpose:** To assess the prevalence, severity, and cost estimates associated with motion artifacts identified on clinical MR examinations, with a focus on the neuroaxis.

**Methods:** A retrospective review of 1 randomly selected full calendar week of MR examinations (April 2014) was conducted for the detection of significant motion artifacts in examinations performed at a single institution on 3 different MR scanners. A base-case cost estimate was computed from recently available institutional data, and correlated with sequence time and severity of motion artifacts.

**Results:** A total of 192 completed clinical examinations were reviewed. Significant motion artifacts were identified on sequences in 7.5% of outpatient and 29.4% of inpatient and/or emergency department MR examinations. The prevalence of repeat sequences was 19.8% of total MRI examinations. The base-case cost estimate yielded a potential cost to the hospital of \$592 per hour in lost revenue due to motion artifacts. Potential institutional average costs borne (revenue forgone) of approximately \$115,000 per scanner per year may affect hospitals, owing to motion artifacts (univariate sensitivity analysis suggested a lower bound of \$92,600, and an upper bound of \$139,000).

**Conclusions:** Motion artifacts represent a frequent cause of MR image degradation, particularly for inpatient and emergency department patients, resulting in substantial costs to the radiology department. Greater attention and resources should be directed toward providing practical solutions to this dilemma.

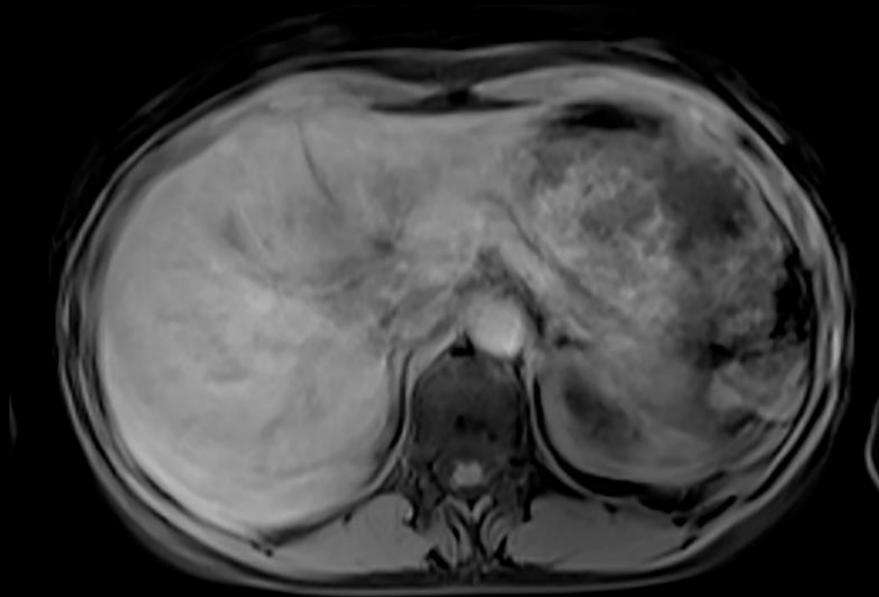
**Key Words:** MRI, motion, cost estimate, economics, motion correction

*J Am Coll Radiol 2015;12:689-695. Copyright © 2015 American College of Radiology*

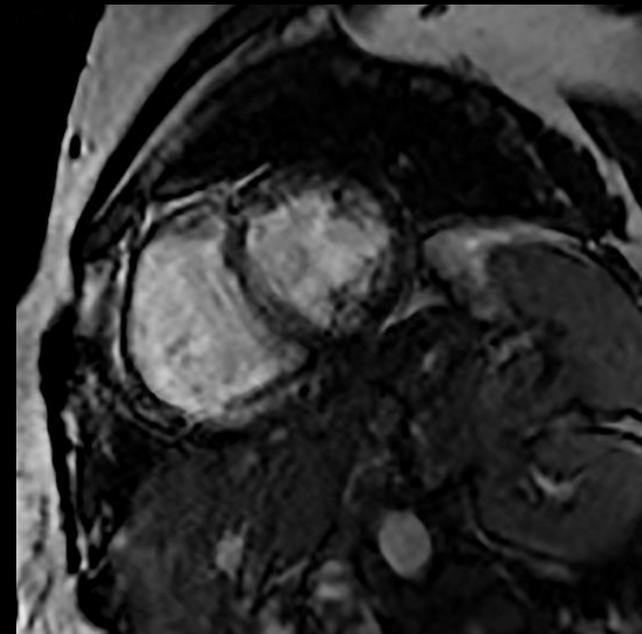
<sup>1</sup> Andre JB. et al. Towards quantifying the prevalence, severity, and cost associated with patient motion during clinical MR examinations. Am Coll Radiol 2015; 12: 689-695.

# Motion can significantly decrease image quality and lead to costly rescans

Respiratory motion



Cardiac motion



# Anticipate motion for high-quality results and boost efficiency during patient preparation with BioMatrix Sensors



## Respiratory triggering with Respiratory Sensor

Integrated into BioMatrix Spine coil

- Automatic detection of breathing patterns
- Immediate display of respiratory curve at scanner & console
- No extra navigator setups
- No respiratory belt



## Cardiac triggering with Beat Sensor<sup>1</sup>

Integrated into BioMatrix Body 12 and BioMatrix Body 18

- Designed for segmented acquisition triggering by Beat Sensor
- Designed to capture ECG signal



<sup>1</sup> Cardiac Triggering for sequences other than Cardiac Cine is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.



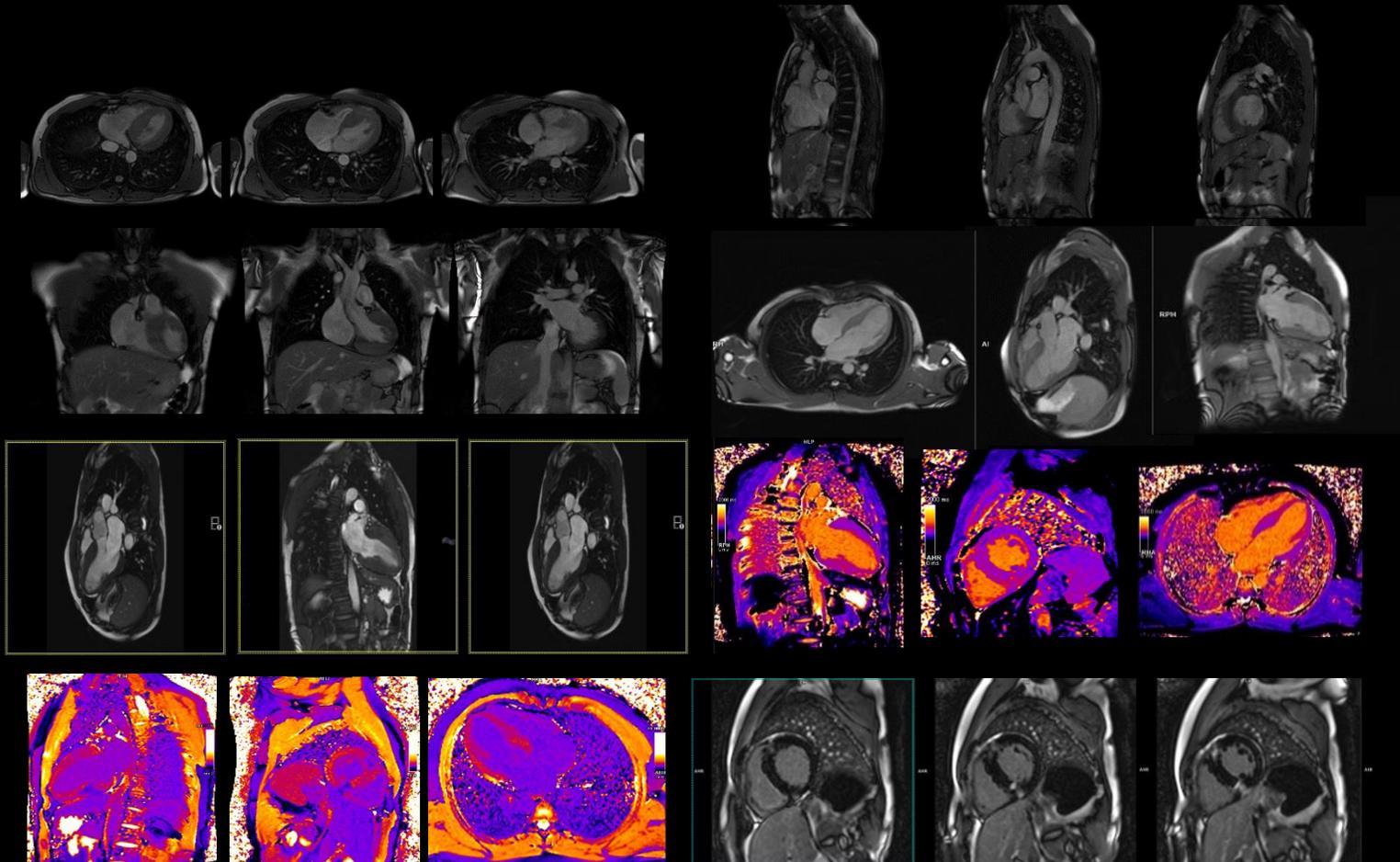
# BioMatrix Beat Sensor<sup>1</sup>

Designed for cardiac imaging

**Cardiac triggering without the  
need for ECG placement**

<sup>1</sup> Cardiac Triggering for sequences other than Cardiac Cine is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# BioMatrix Beat Sensor<sup>1</sup> Cardiac Triggering For the entire CMR exam



## Cardiac MRI exams without ECG



BioMatrix

# BioMatrix Beat Sensor<sup>1</sup> for improved patient experience



*“With Beat Sensor we perform cardiac exams without having to place ECG electrodes! And we are observing a substantial improvement in patient experience. Especially for female patients who can feel uncomfortable when we place electrodes on their chests.”*

Evelien Demeyer, Radiographer  
Jan Yperman Ziekenhuis, Ypres, Belgium

<sup>1</sup> Cardiac Triggering for sequences other than Cardiac Cine is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed. The statements by Siemens' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results. This statement is from a person, who or whose institution is engaged in a collaboration with Siemens.

# BioMatrix Beat Sensor<sup>1</sup> for Cardiac Triggering

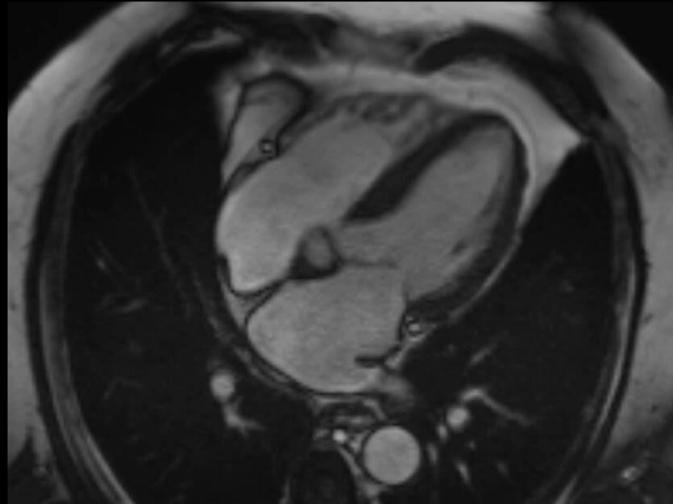
Beat Sensor Cardiac

63 /min RR-I 945 ms



ECG I

63 /min RR-I 945 ms



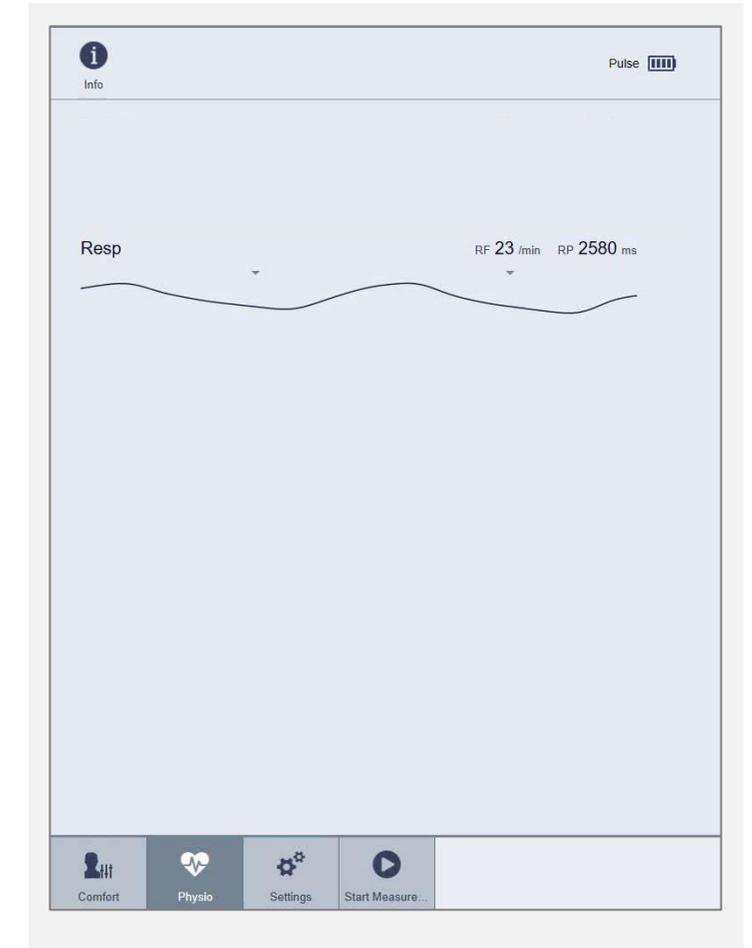
CINE Segmented with ECG



CINE Segmented with Beat Sensor

<sup>1</sup> Cardiac Triggering for sequences other than Cardiac Cine is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# Immediate detection of breathing patterns with integrated BioMatrix Respiratory Sensors



No extra  
navigator  
setups

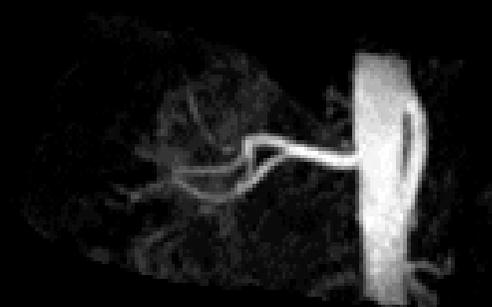
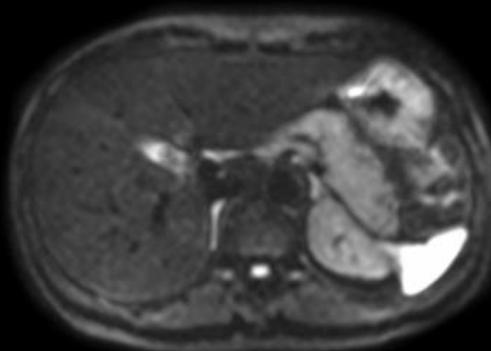
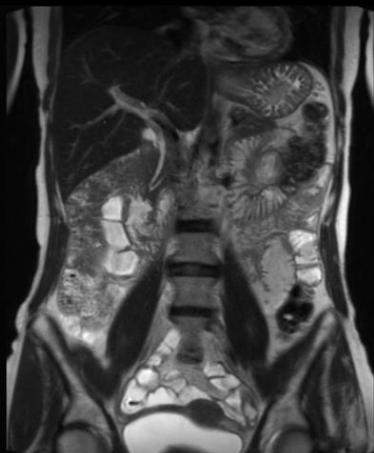
No  
respiratory  
belt

Immediate  
display of  
respiratory  
curve at the  
scanner

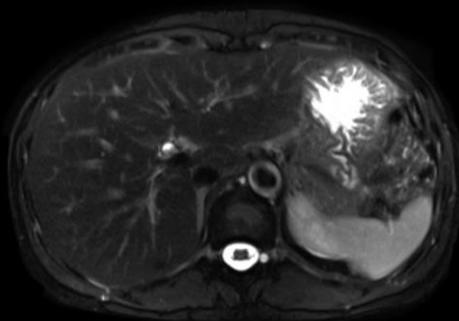
# Seamlessly integrated respiratory triggering with BioMatrix Respiratory Sensors



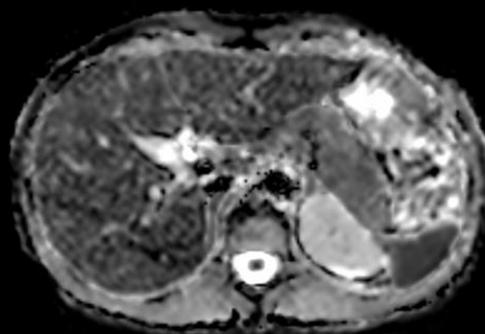
BioMatrix



Respiratory triggered NATIVE Angiography of renal arteries



Respiratory triggered T2 HASTE (fat sat)



Respiratory triggered DWI (b800, ADC map)



Respiratory triggering with Respiratory Sensor



# Seamlessly integrated triggering with BioMatrix Respiratory Sensors



MRCP triggered with Respiratory Sensor

*“We are **very impressed with the quality and accuracy of respiratory triggering with the BioMatrix Respiratory Sensor.** And it is so easy to use! **We now use it routinely for all respiratory-triggered exams.**”<sup>1</sup>*



**Dr. Johannes Budjan**  
University Medical Center Mannheim,  
Germany



<sup>1</sup> The statements by Siemens' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results. This statement is from a person, who or whose institution is engaged in a collaboration with Siemens.

# Anticipate motion for high-quality results

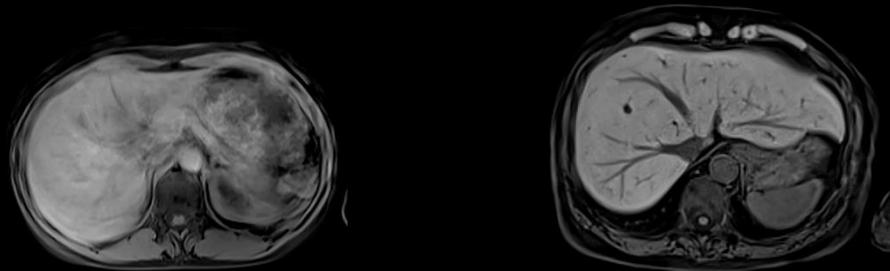
## BioMatrix Sensors

### Respiratory motion



Respiratory motion causing image artifacts

Easy respiratory triggering with **Respiratory Sensors**



### Cardiac motion



Cardiac motion causing image artifacts

Designed for ECG-free cardiac triggering<sup>1</sup> with **Beat Sensor**



BioMatrix



<sup>1</sup> Cardiac Triggering for sequences other than Cardiac Cine is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

Accelerate patient preparation for increased efficiency

# BioMatrix Interfaces



# BioMatrix Interfaces

## Accelerate patient preparation for increased efficiency

### Select&GO

Fast and easy touch positioning  
by any user for any type of patient

### BioMatrix Dockable Table with eDrive

Easy patient transport in all situations



Easy docking  
with  
**AutoDocking**  
functionality

Effortless  
maneuverability  
with **eDrive**  
assistance



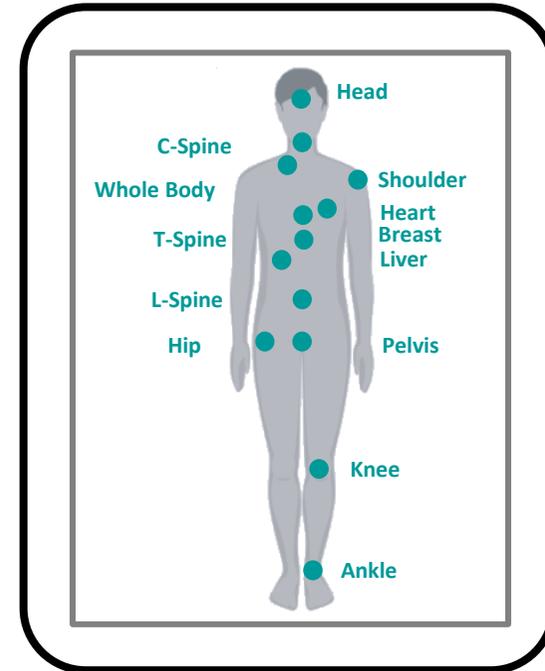
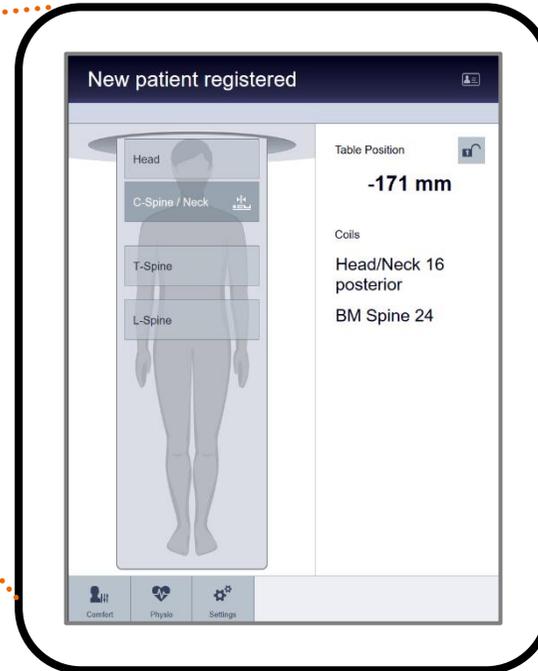
# Select&GO

## Streamline patient setup with BioMatrix interfaces

Powered by  
Artificial Intelligence



BioMatrix



**30% faster<sup>1</sup>  
and reproducible patient set-up**

**AI-powered  
Intelligent Body Model**



<sup>1</sup> Data on file.

# Easy patient transport

## BioMatrix Dockable Table with eDrive



Easy and  
**intuitive interface**

Sensitive to user touch

Effortless maneuverability with  
**eDrive assistance**

Up to 250 kg

Easy docking with  
**AutoDock**

No pedals required

# Let MAGNETOM Sola wake up early New system start timer boots system automatically



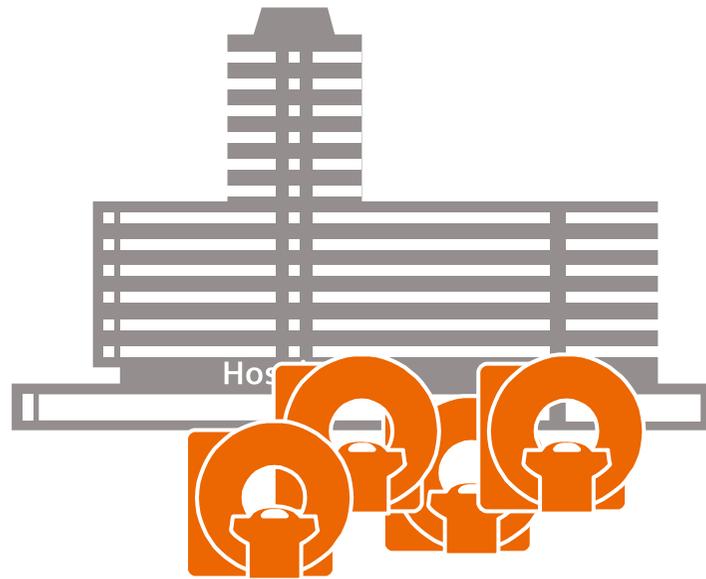
*“With the system start timer, we can scan one more patient per day”<sup>1</sup>*

**Prof. Mathias Langer,**  
University Hospital Freiburg, Germany

**Start your exams right away!**

<sup>1</sup> The statements by Siemens' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results. This statement is from a person, who or whose institution is engaged in a collaboration with Siemens.

# Siemens Healthineers' fleet management solutions ensure reproducible results across your entire MR system fleet



# Move knowledge, not staff.

With *syngo* Virtual Cockpit<sup>1</sup>  
Your software for  
remote scanning assistance



<sup>1</sup> *syngo* Virtual Cockpit is not yet commercially available in all countries. Its future availability cannot be guaranteed.

# A paradigm shift in scanner operation through remote assistance with *syngo* Virtual Cockpit<sup>1</sup>



Connect up to 3 scanners to each expert, simultaneously



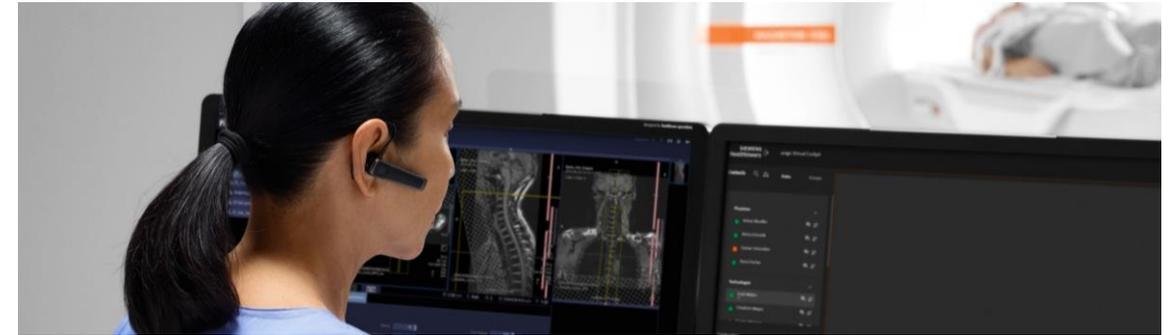
Assist MR, MR-PET, CT & PET/CT scanners



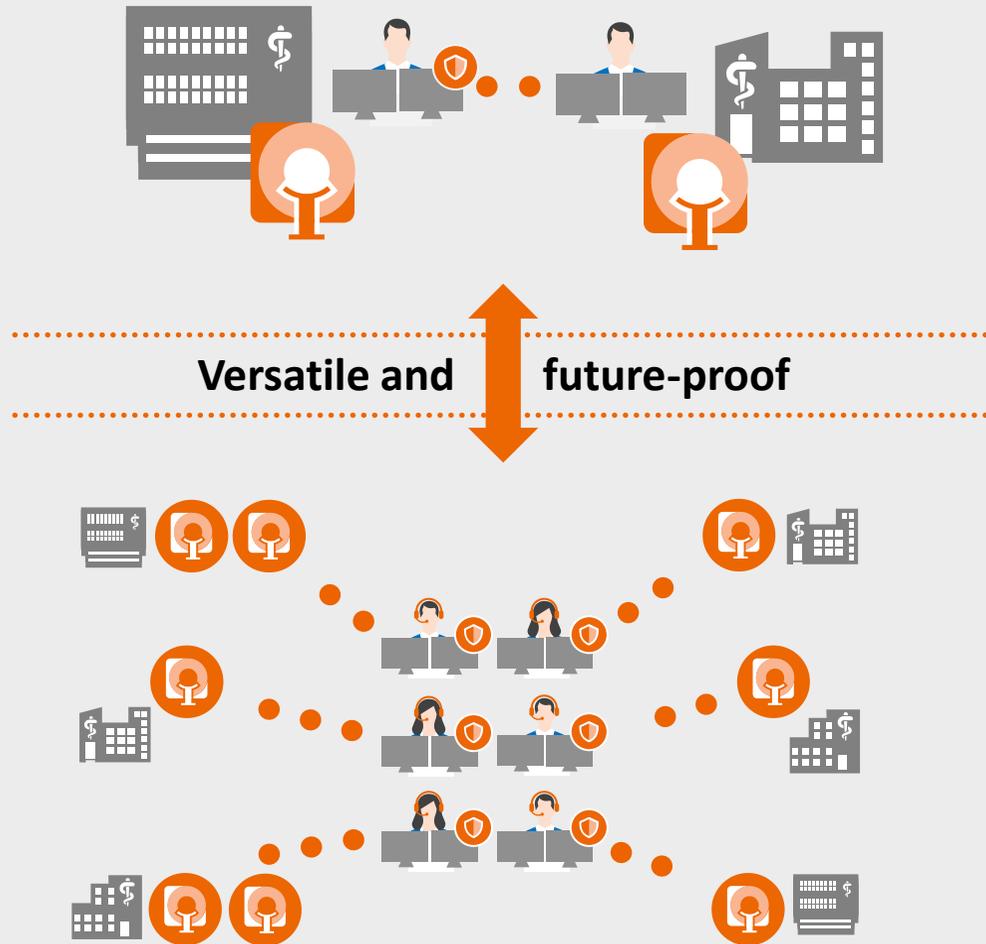
Communicate with scanner operators via chat, voice, and video

<sup>1</sup> *syngo* Virtual Cockpit is not yet commercially available in all countries. Its future availability cannot be guaranteed. Prerequisite: Expert-i-enabled modality from Siemens Healthineers.

# syngo Virtual Cockpit<sup>1</sup> supports a wide range of use cases



-  **Routine**
-  **Complex examinations**
-  **Bottlenecks**
-  **Training**

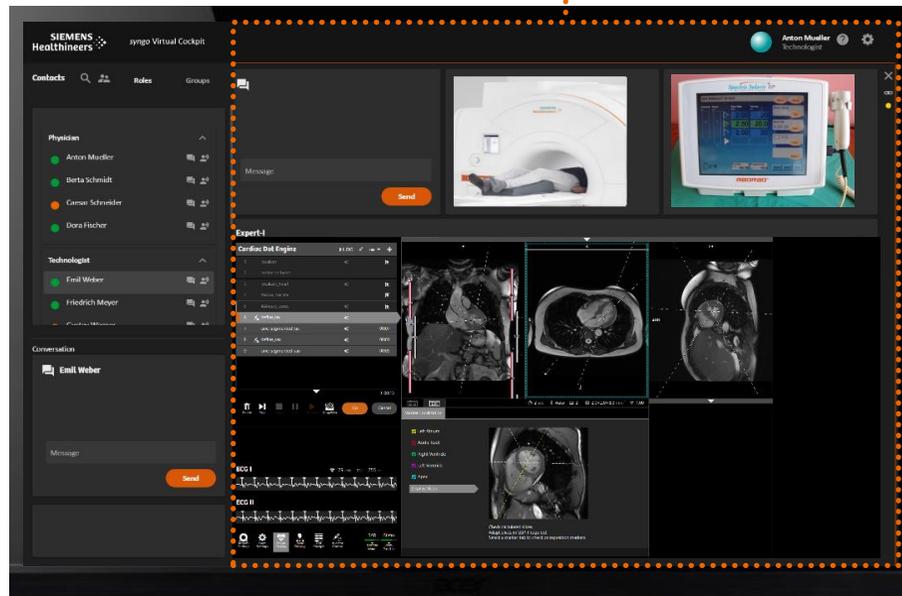


<sup>1</sup>syngo Virtual Cockpit is not yet commercially available in all countries. Its future availability cannot be guaranteed. Prerequisite: Expert-i-enabled modality from Siemens Healthineers.

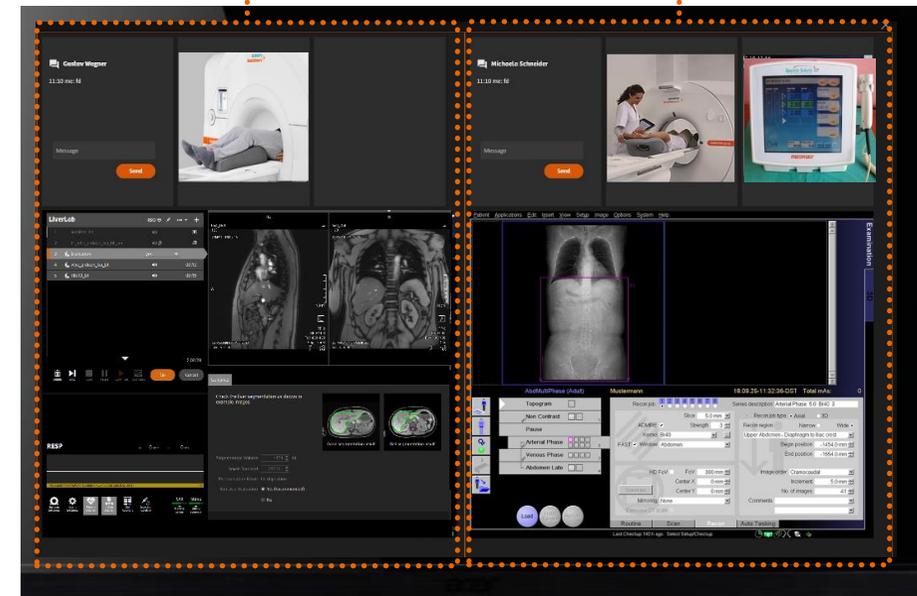
# syngo Virtual Cockpit<sup>1</sup>

## Overview with 3 scanners assisted simultaneously

MAGNETOM System 1



3rd system,  
MAGNETOM System 2 e.g., SOMATOM go.Up



<sup>1</sup> syngo Virtual Cockpit is not yet commercially available in all countries. Its future availability cannot be guaranteed. Prerequisite: Expert-i-enabled modality from Siemens Healthineers.

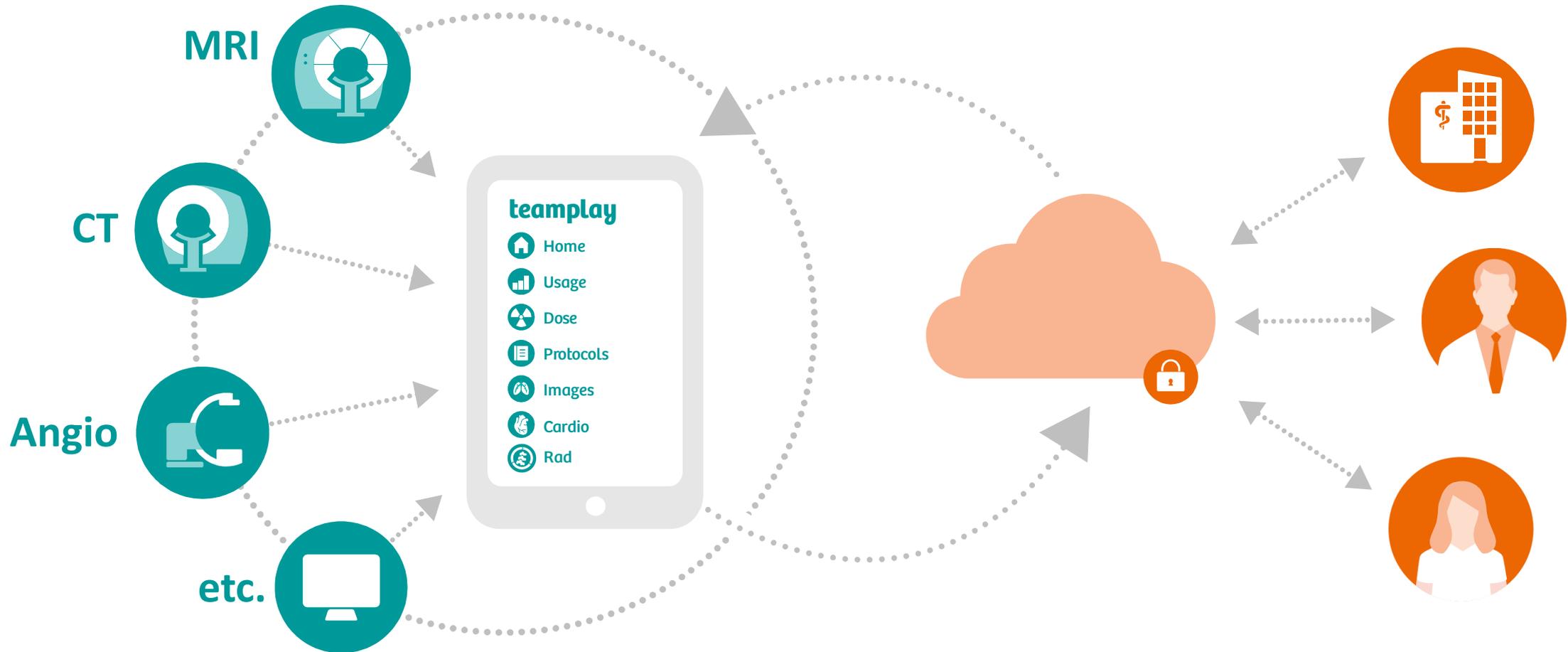
# teampay<sup>1</sup>

The performance  
management solution



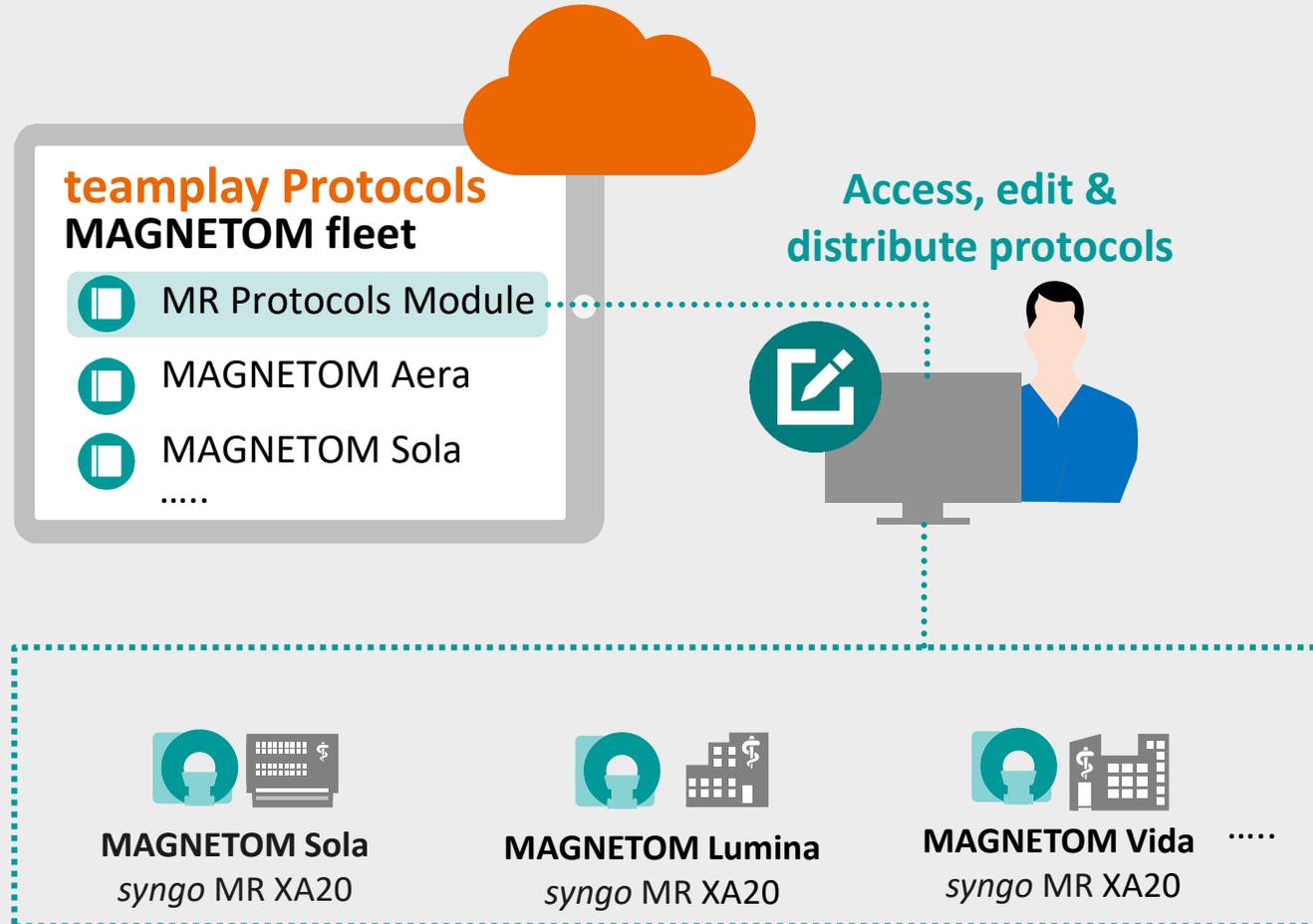
<sup>1</sup> teamplay is not commercially available in all countries. If its services are not marketed in countries due to regulatory or other reasons, the service offering cannot be guaranteed.

## The performance management solution for radiology



<sup>1</sup> teampay is not commercially available in all countries. If its services are not marketed in countries due to regulatory or other reasons, the service offering cannot be guaranteed.

# MR Protocols Module: Centrally and remotely manage protocols for your fleet



Centrally manage all protocols of your MRI scanner fleet<sup>1</sup>, beyond physical location, **without interrupting scanning**

Easily **distribute** your standardized protocols to your **syngo MR XA-line systems**

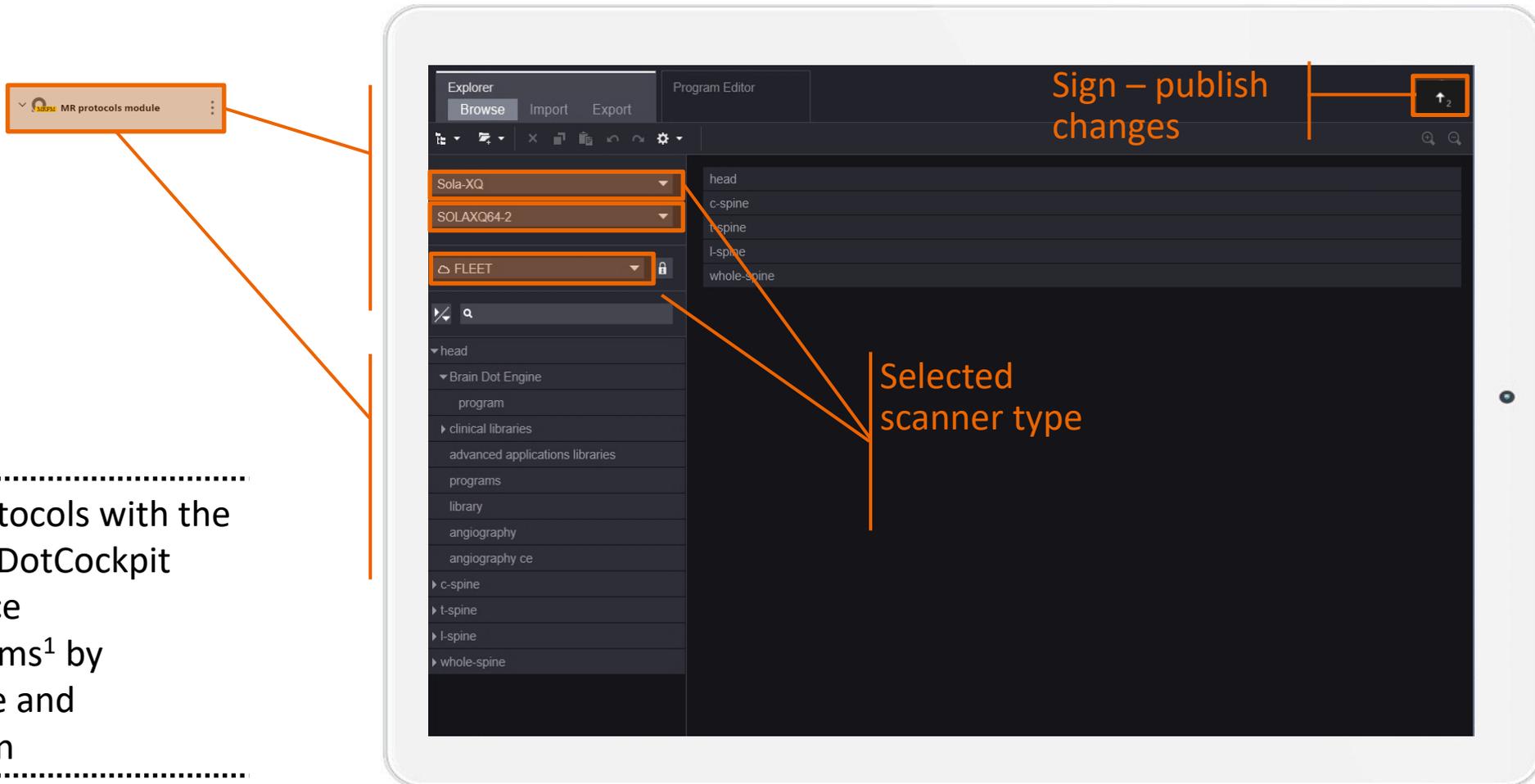
teampay protocols is applicable for other imaging devices<sup>2</sup>

<sup>1</sup> Siemens Healthineers MAGNETOM scanners

<sup>2</sup> e.g., CT, PET/CT, ...

# teamplay Protocols – MR Protocols Module

## Editing in few steps with our unique exam user interface

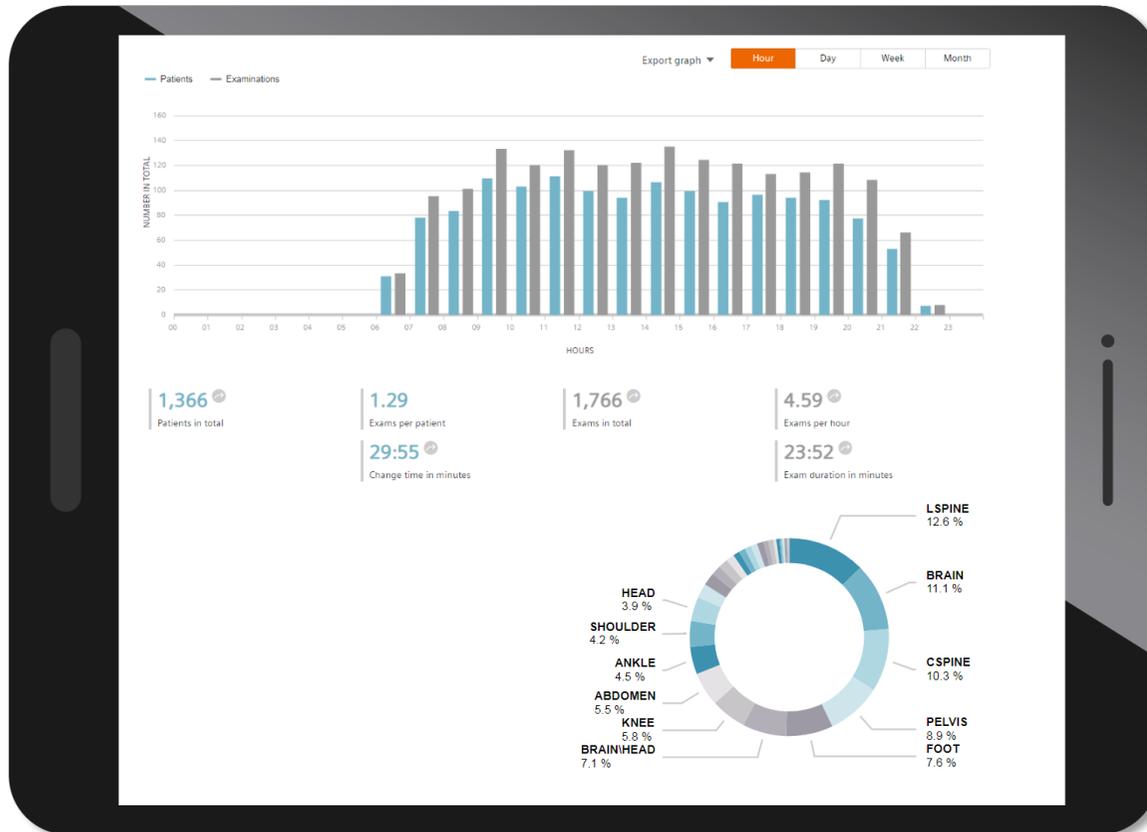


- Manage protocols with the easy-to-use DotCockpit user interface
- Access systems<sup>1</sup> by scanner type and configuration

<sup>1</sup> syngo MR XA-line systems >=XA20

# teampay usage

## Manage the performance of your scanner fleet



Comprehensive overview of **scanner KPIs**

Statistics on **scan time, change time, examined body regions, etc.**

Analysis of **scanner utilization and table occupancies**

Regional **benchmark of performance across institutions**

# Manage your institution's education with PEPconnect<sup>1</sup> & PEPconnections<sup>1</sup>

PEPconnect is the first personalized **education platform** designed for individual healthcare professionals. With the **premium subscription** PEPconnections, institutions can easily **manage** their workforce **education**.



## Personalized learning experience

for competency-based online education to increase knowledge, skills, and abilities



My Education Space



## Customized workforce management

for optimized workforce and compliance management, while advancing learning



Workforce Management & Administration

<sup>1</sup> The products/features and/or service offerings (here mentioned) are not commercially available in all countries and/or for all modalities. If the services are not marketed in countries due to regulatory or other reasons, the service offering cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

# The Customer Services portfolio from Siemens Healthineers enables you to perform today and scale tomorrow

Joining forces to  
scale your business

Maximizing your  
equipment's performance

Teaming up for  
operational efficiency

Accelerating your  
daily operations

Securing your  
assets' future

Boosting your  
staff's expertise

Digitally enabled services

Service Plans

UpScale  
Services

UpTime  
Services

UpTeam  
Services

UpSpeed  
Services

UpLift  
Services

UpSkill  
Services



# Selected highlight services for MAGNETOM Sola



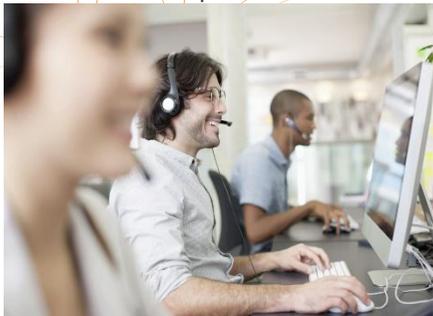
## Advance Plans

Enable you to access the latest innovations, enhancing workforce experience, and improving equipment durability and cybersecurity throughout your equipment's entire service life, while at the same time meeting your regulatory, quality, and financial needs.



## Education Plans

The Education Plans GAIN, GROW, and LEAD offer continuous education tailored to the needs of your institution to empower both your staff and your organization through know-how and expertise.



## UpSpeed Service Guardian Program<sup>1</sup>

Maximizes your equipment uptime through real-time system monitoring, AI-based prediction mechanisms, and proactive services. It detects and corrects errors before they even occur and turns unplanned downtime into planned activities.



## Smart Remote Services

Smart Remote Services (SRS) is a fast, secured and powerful data link that connects your medical equipment to our experts, who provide you with proactive and interactive services that support you in your daily routine and bring speed to your running operations.



**Service can make the difference in the success of your daily operations.**

<sup>1</sup> Guardian deliverables vary by device and are not applicable to all Siemens Healthineers equipment. Ask a local Customer Service representative for advice. Prerequisites: stable SRS connection with adequate bandwidth. Only available when connected to SRS infrastructure.

# MAGNETOM Sola

## Embrace human nature at 1.5T with BioMatrix



**Embrace full 1.5T performance**

with Tim 4G Coil portfolio and BioMatrix Technology

**Embrace true 1.5T productivity**

with Deep Resolve, Turbo Suite and myExam Companion<sup>1</sup>

**Embrace new 1.5T clinical capabilities**

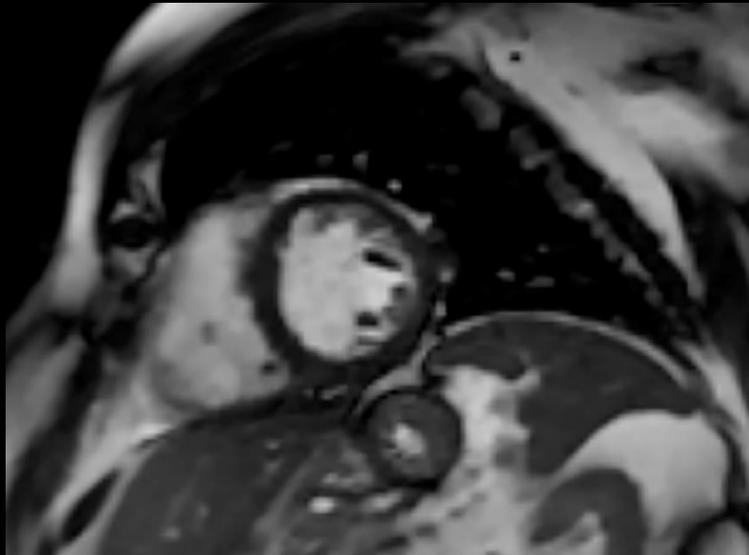
with Inline Compressed Sensing

<sup>1</sup> myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

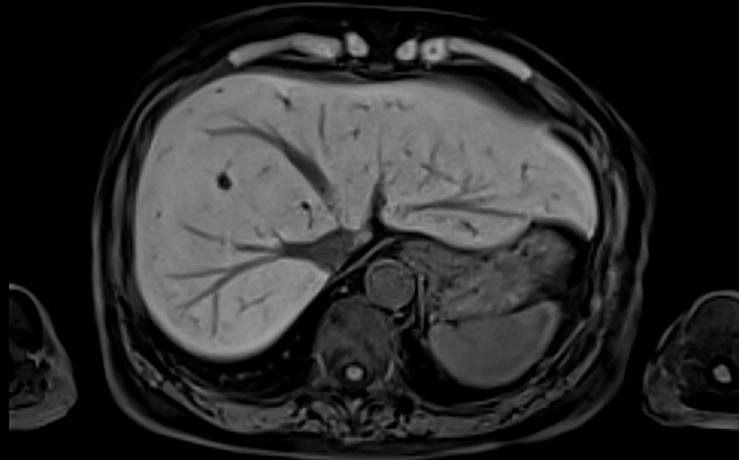
# Embrace new clinical capabilities at 1.5T

## Grant more patients access to advanced MRI

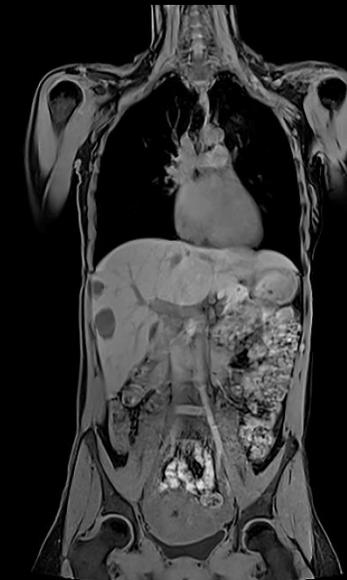
Cardiac imaging



Liver imaging



Whole-body imaging



**Increasing number of indications  
for MR**

**+16% per year<sup>1</sup>**

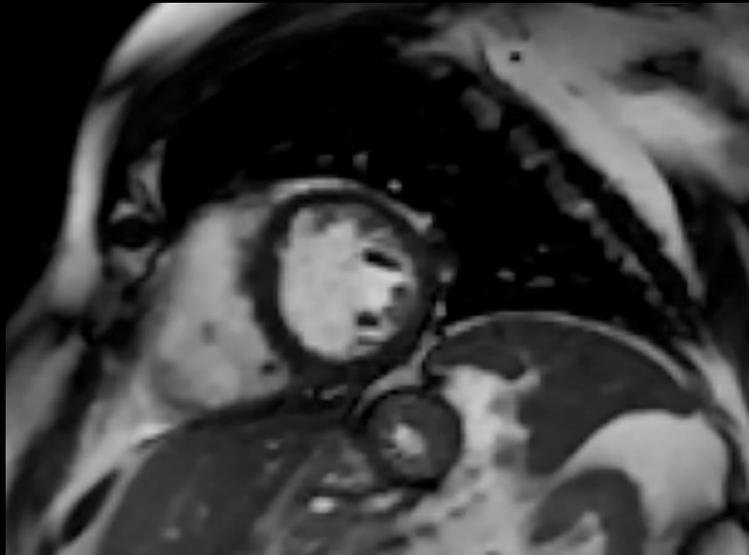
**New in Myeloma guidelines**

<sup>1</sup> IMV Market Report, 2015.

# Embrace new clinical capabilities at 1.5T

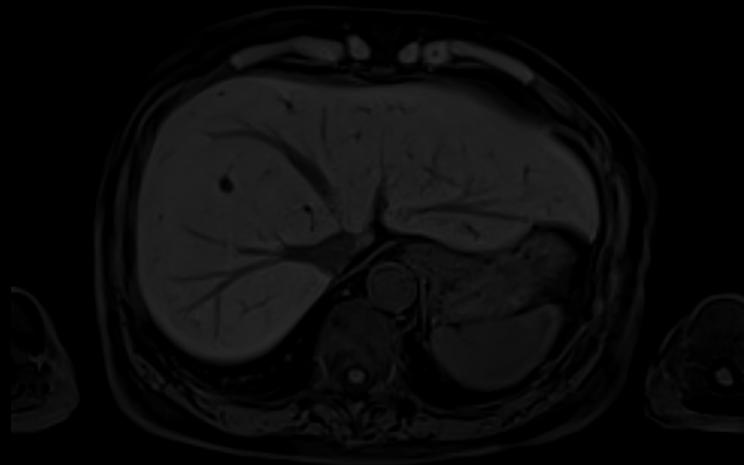
## Grant more patients access to advanced MRI

Cardiac imaging



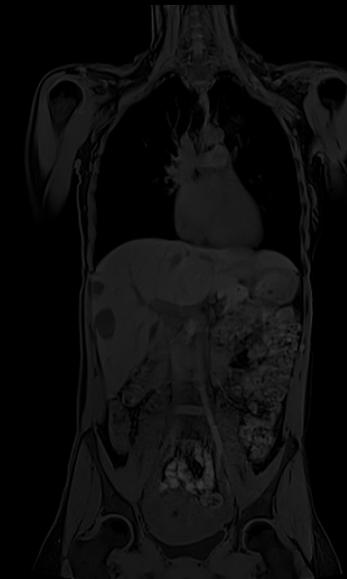
**Increasing number of indications  
for MR**

Liver imaging



**+16% per year<sup>1</sup>**

Whole-body imaging



**New in Myeloma guidelines**

<sup>1</sup> IMV Market Report, 2015.

## Daily challenges in cardiac MRI

### Non-diagnostic exams in severely ill patients

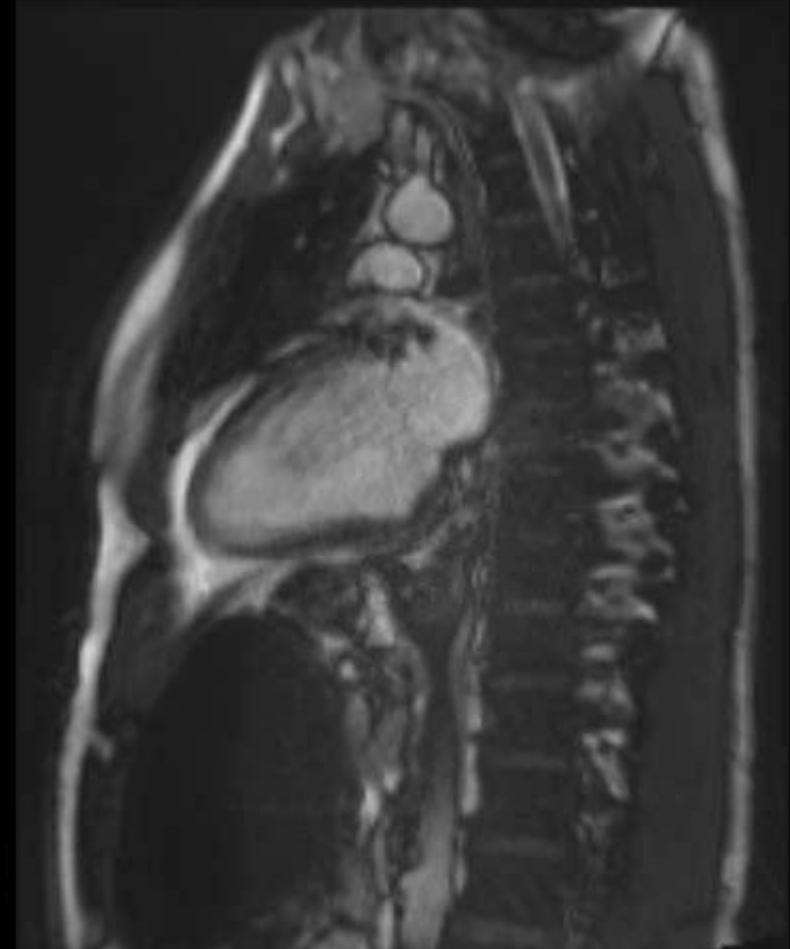
Difficulties to endure  
**long scan duration**

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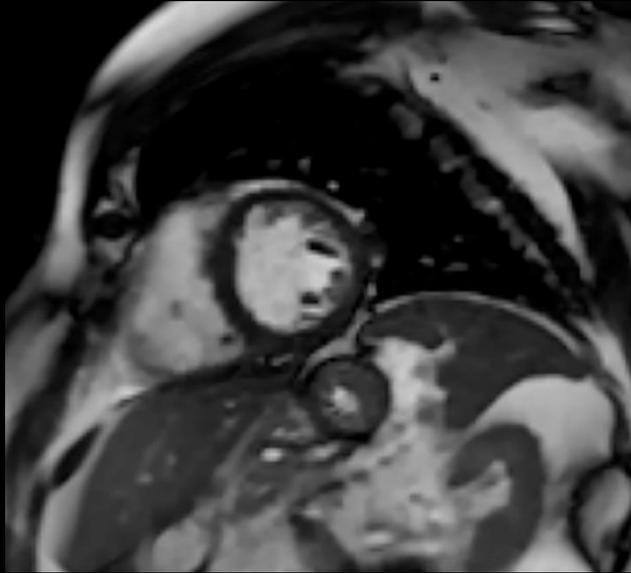
Difficulties to perform  
**breathholds**

---

Mismatched triggering in  
**arrhythmic patients**



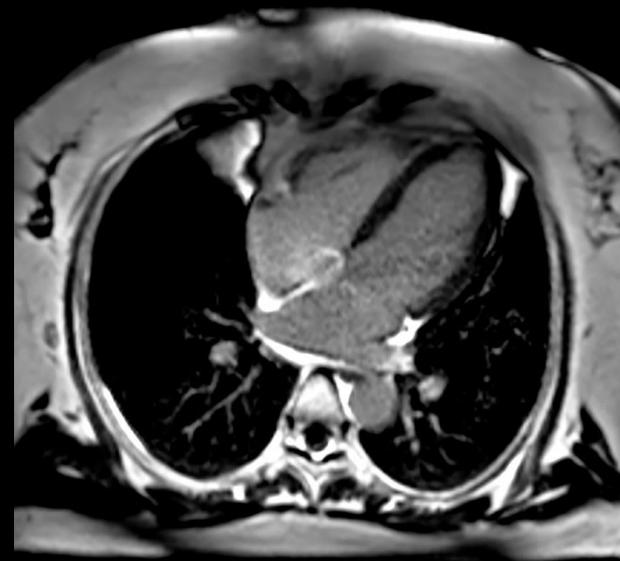
# Improving patient experience with free-breathing applications



## Compressed Sensing Cardiac Cine

Acquire free-breathing, high-resolution Cardiac Cine images.

Capture the whole cardiac cycle for precise quantification.



## PSIR HeartFreeze

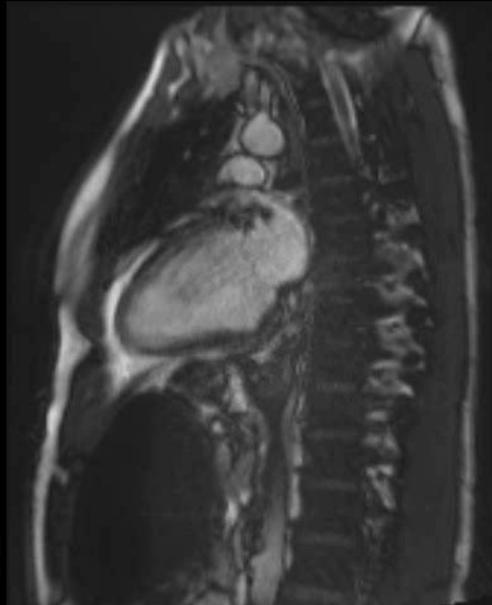
Acquire free-breathing images with motion-correction for PSIR.

Grant more patients access to MRI



Turbo Suite  
Elite

# Free-breathing acquisition with Compressed Sensing Cardiac Cine



Conventional Cardiac Cine  
susceptible to breathing motion  
and irregular heart rates



Compressed Sensing Cardiac Cine



Free-breathing  
acquisition in  
one heartbeat

For patients  
with  
arrhythmia

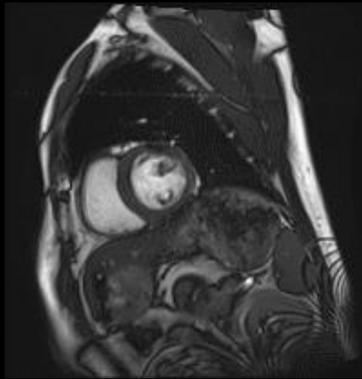


Turbo Suite  
Elite

# Cardiac imaging with Turbo Suite Elite

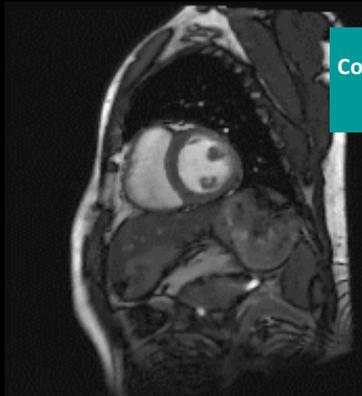
## Two steps ahead in capabilities.

### Turbo Suite Essential



Conventional Cardiac Cine  
TA 4–6 min, 7–12 breath-holds

### Turbo Suite Elite



Compressed  
Sensing

Compressed Sensing Cardiac Cine  
TA 15-20 sec  
1 heartbeat, free-breathing

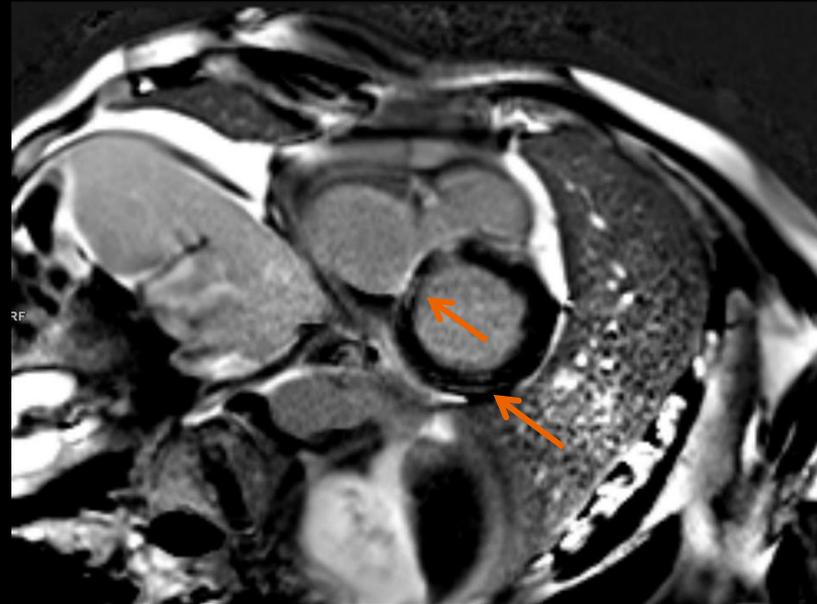
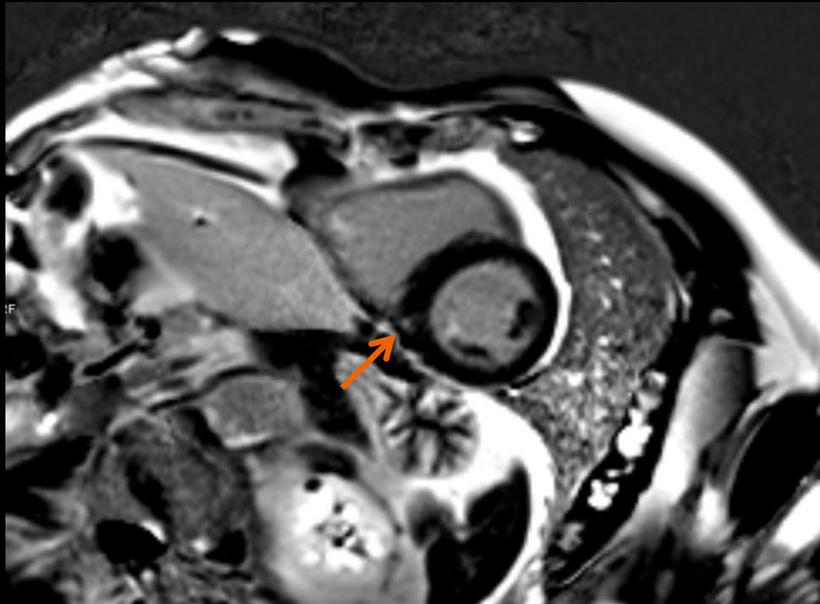
>4 min  
saved

Free  
Breathing  
exam



Turbo Suite  
Elite

# Free-breathing acquisition with PSIR HeartFreeze

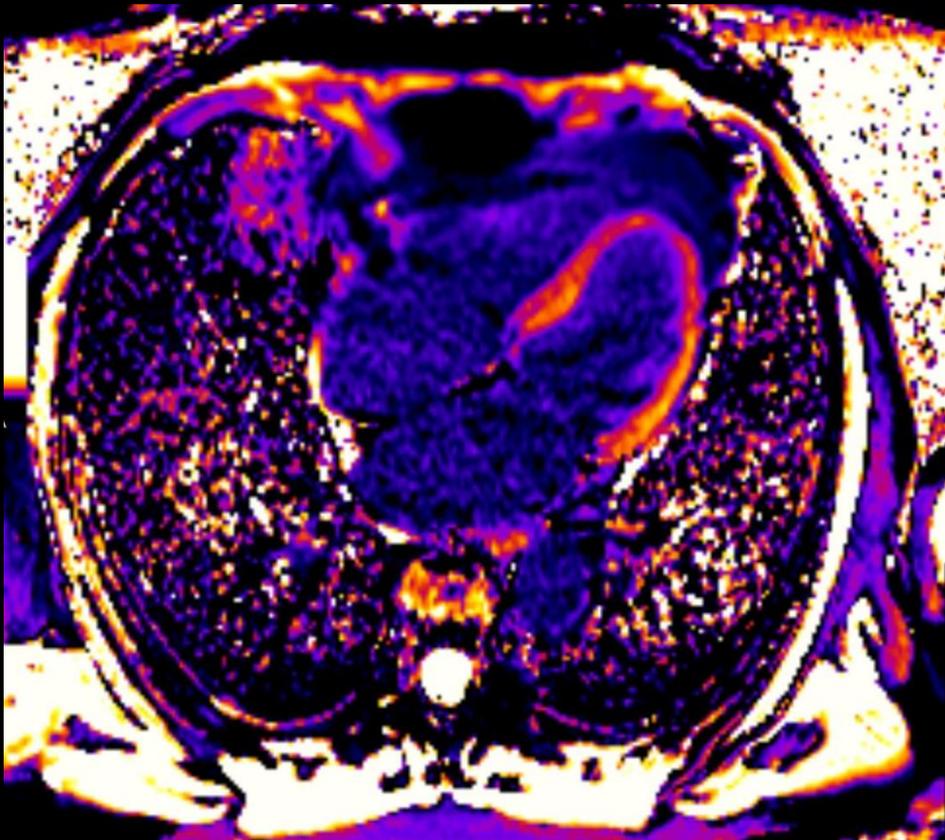


Grant more  
patients access  
to MRI

Motion-robust, phase-sensitive inversion recovery contrast imaging

# MyoMaps

## The next step in quantitative cardiac assessment



T1 Map

### MyoMaps with HeartFreeze

- Inline myocardial quantification provides T1, T2 and T2\* parametric maps
- HeartFreeze enables motion-robust cardiac acquisitions

# Easy and fast cardiac exam planning with the myExam Cardiac Assist – simplified workflow for cardiac flow exams



## myExam Cardiac Assist

### Automation features

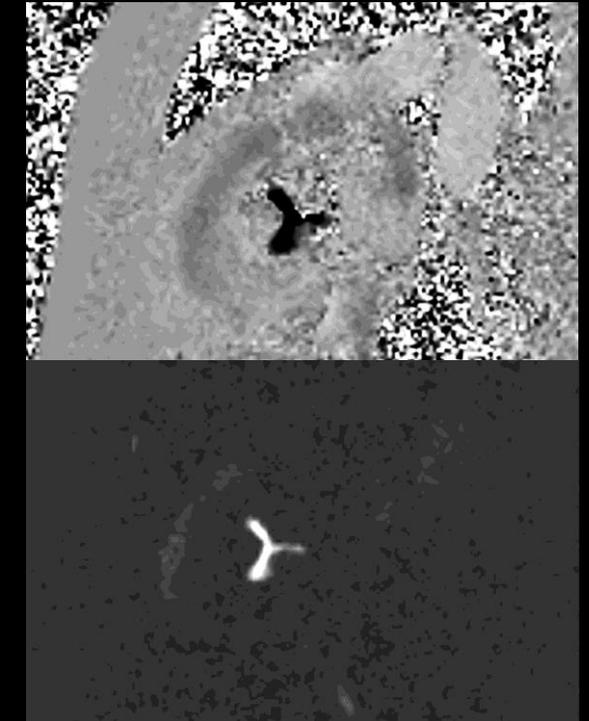
- AutoAlign Heart
- Auto Timing
- Auto FoV
- Motion correction
- Inline Ventricular Function



## myExam Cardiac Assist

### Automated flow positioning with AutoAlign:

- Aortic Valve
- Mitral Valve
- Left ventricular outflow tract

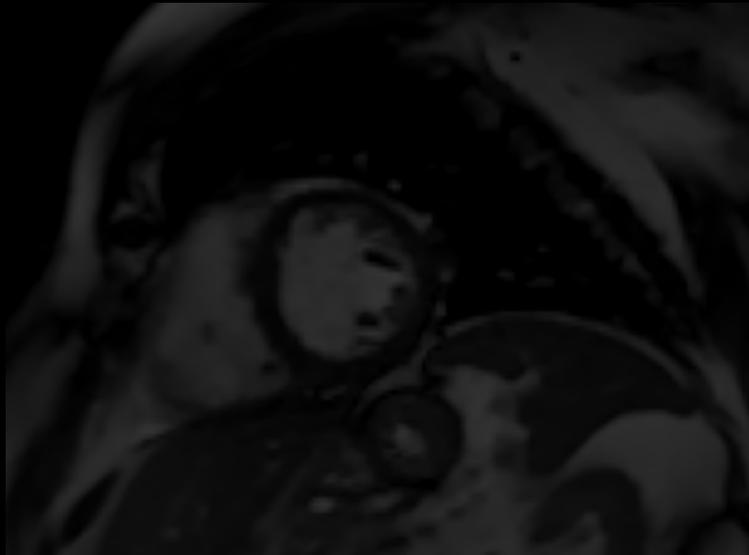


Easy and fast cardiac flow exam planning<sup>1</sup>

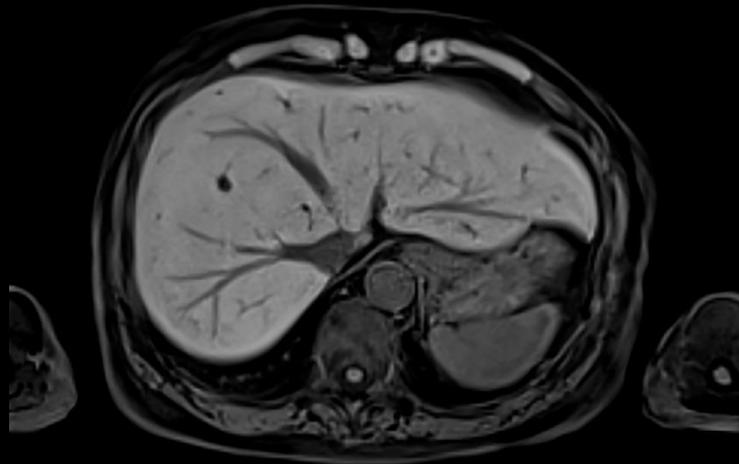
# Embrace new clinical capabilities at 1.5T

## Grant more patients access to advanced MRI

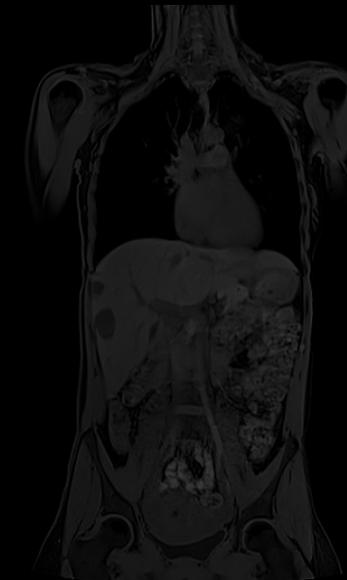
Cardiac imaging



Liver imaging



Whole-body imaging



Increasing number of indications  
for MR

**+16% per year<sup>1</sup>**

New in Myeloma guidelines

<sup>1</sup> IMV Market Report, 2015.

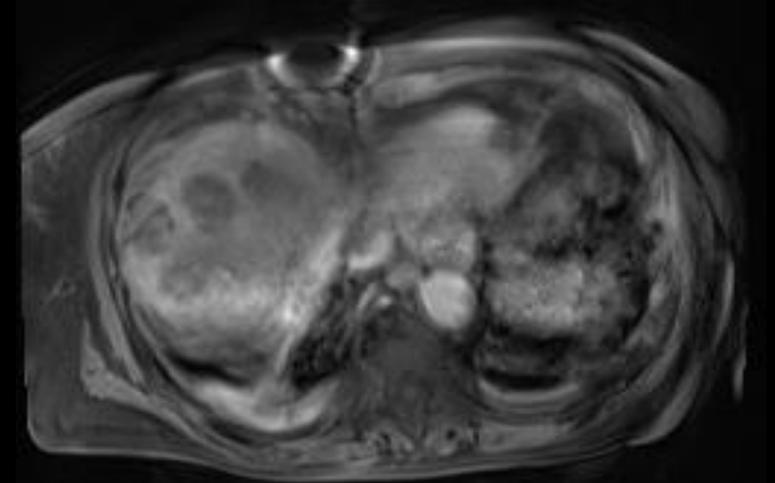
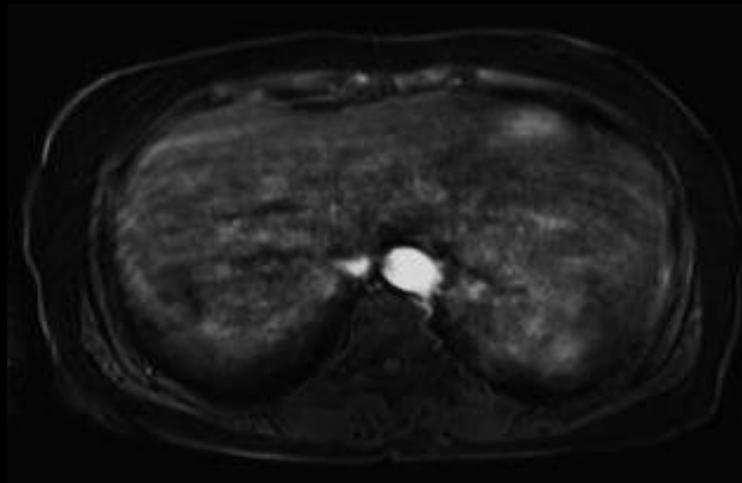
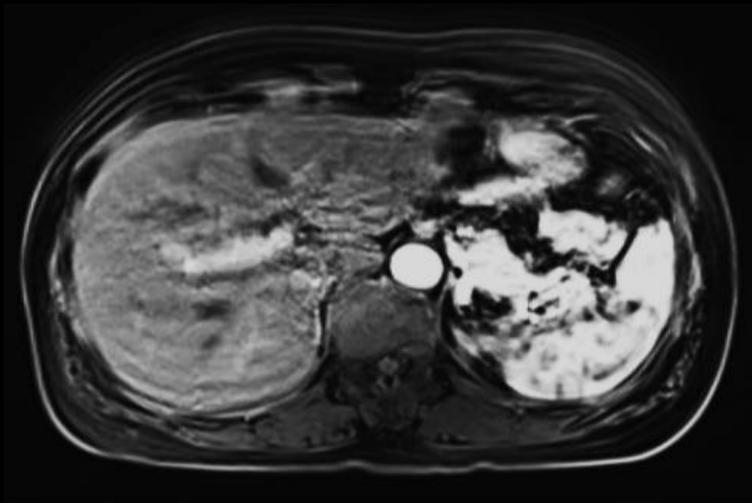
# Daily challenges in abdominal MRI

## Non-diagnostic exams in severely ill patients

50-year-old woman  
**transient dyspnea**

63-year-old man  
**hearing impairment**

82-year-old woman  
**dementia**



# Expand the patient population eligible for MRI With Compressed Sensing. Beyond Speed.



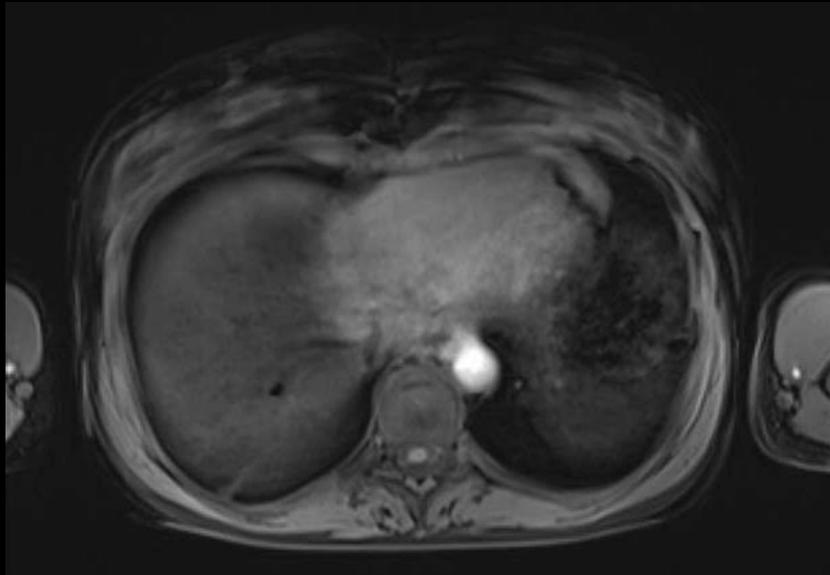
Turbo Suite  
Elite



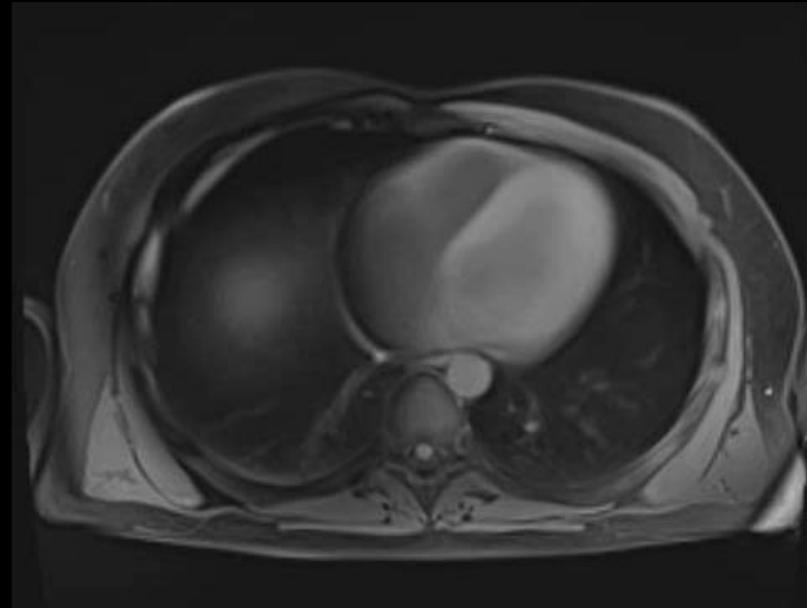
## Compressed Sensing GRASP-VIBE

Beyond speed. Beyond motion.

# Expand patient population eligible for abdominal MRI with Compressed Sensing GRASP-VIBE



Conventional measurement  
susceptible to respiratory motion



Compressed Sensing GRASP-VIBE

Free-breathing,  
push-button  
acquisition



Turbo Suite  
Elite

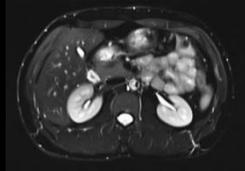
# Abdominal imaging with Turbo Suite Elite

## Two steps ahead in capabilities.

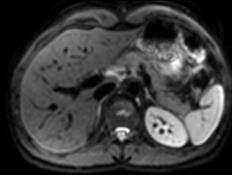
### Turbo Suite Essential



T2 HASTE cor  
1:10 min



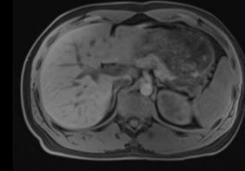
T2 HASTE FS tra  
0:50 min



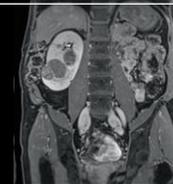
DWI, b800  
TA 3:29 min



3D T2 SPACE MRCP, TA  
5:48 min



CAIPI VIBE tra,  
4 x 12 s breath-hold



CAIPI VIBE cor,  
18 s breath-hold

12:23

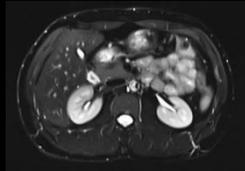
>50%  
Reduction

5:08

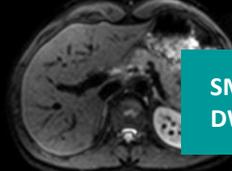
### Turbo Suite Excelerate



T2 HASTE cor  
1:10 min



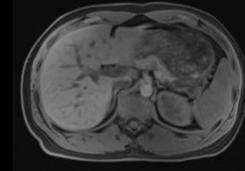
T2 HASTE FS tra  
0:50 min



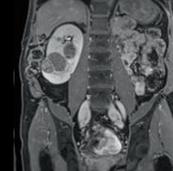
DWI SMS 2, b800  
TA 1:46 min



CS 3D T2 SPACE  
MRCP, TA 0:16 min

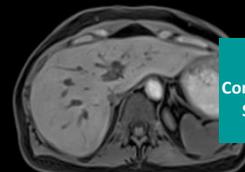


CAIPI VIBE tra,  
4 x 12 s breath-hold



CAIPI VIBE cor,  
18 s breath-hold

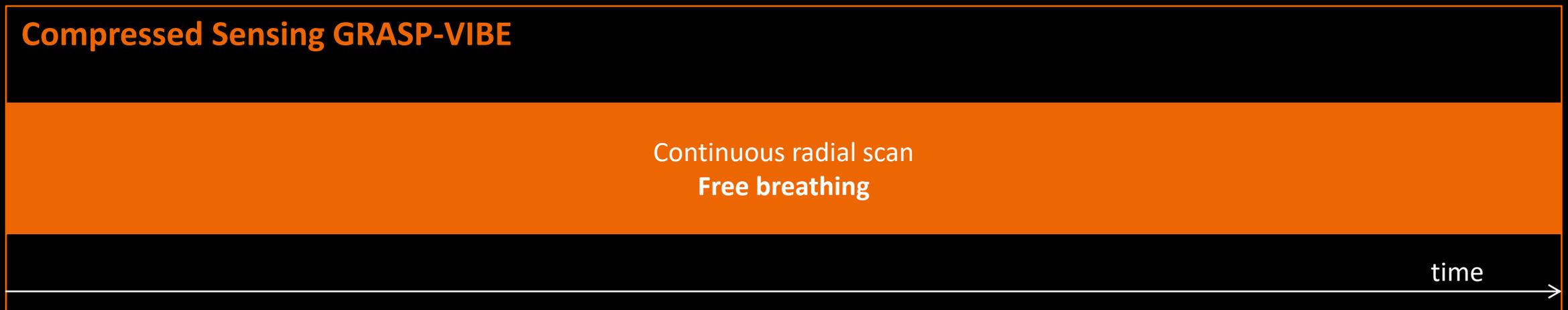
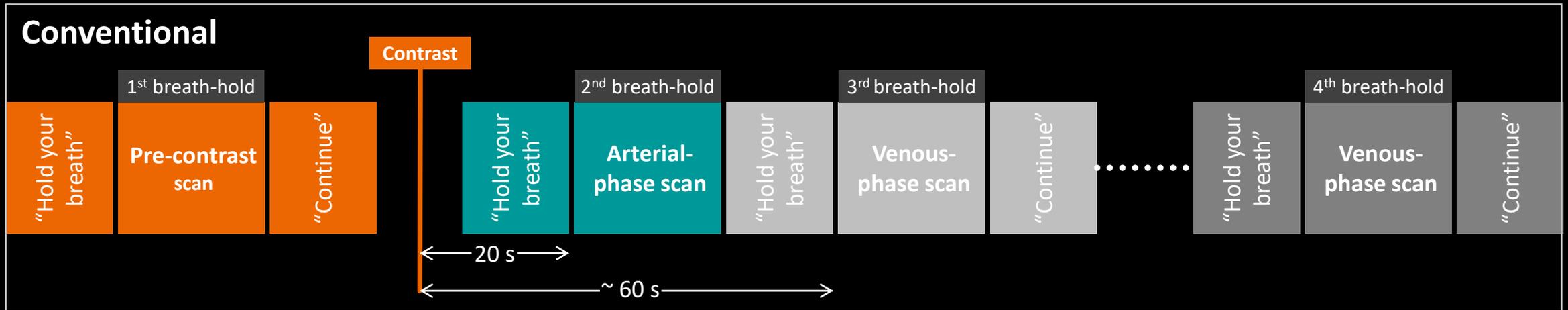
### Turbo Suite Elite



CS 3D GRASP-VIBE, free-  
breathing dynamics

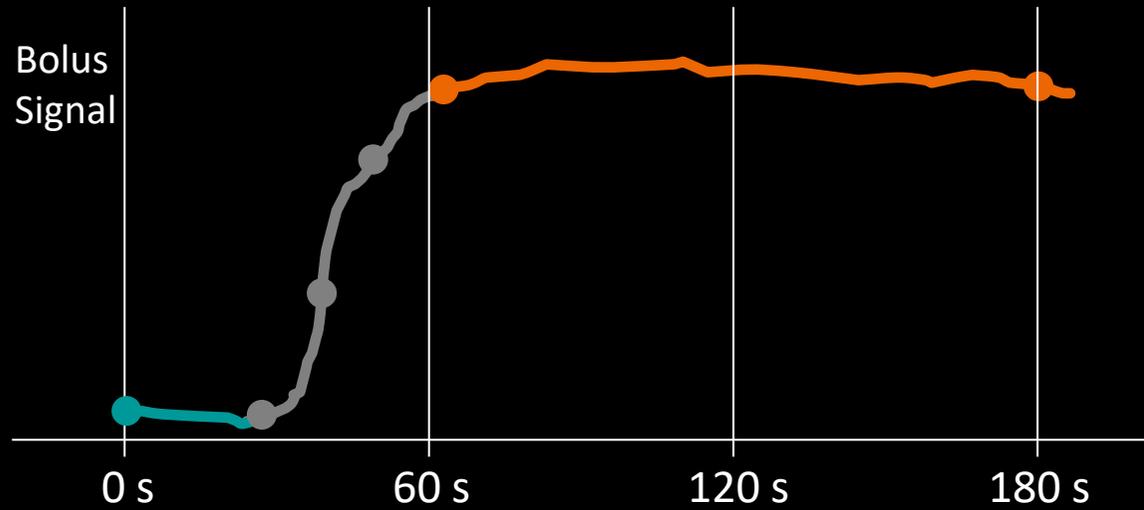
Free  
Breathing  
exam

# Push-button scan instead of several breath-hold scans with complex timing



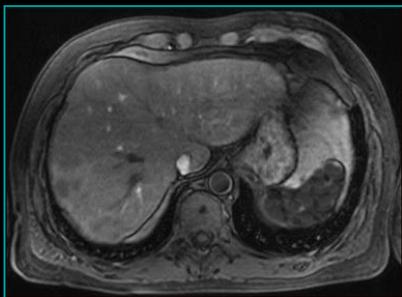
# Automatic recognition of liver phases

## Reconstruction & labeling of key images

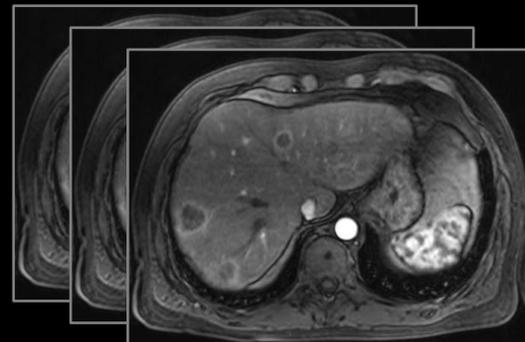


Only the **clinically relevant** series are reconstructed and automatically labeled

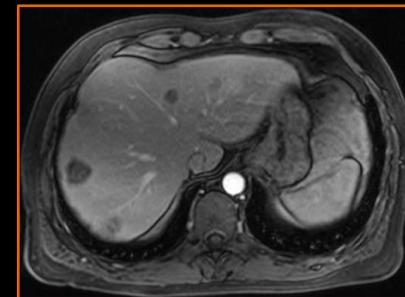
Pre-contrast



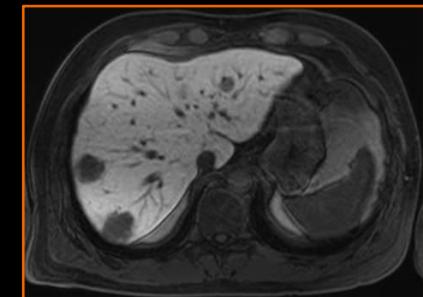
Arterial



Portal-venous



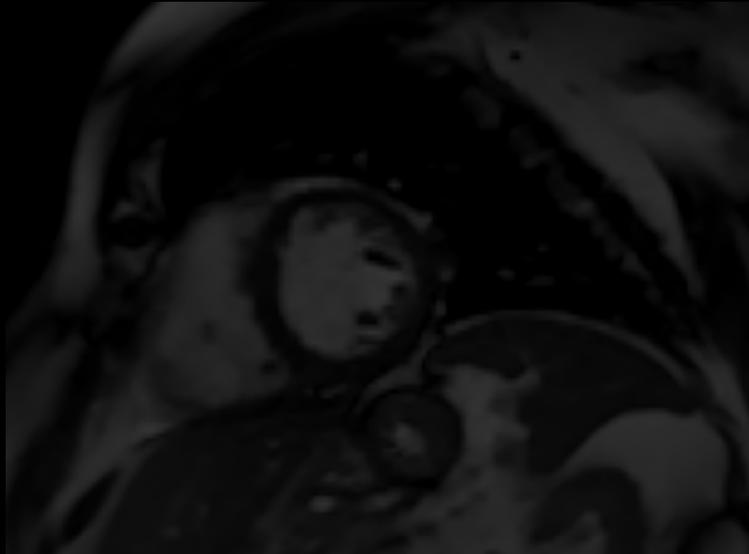
Delayed



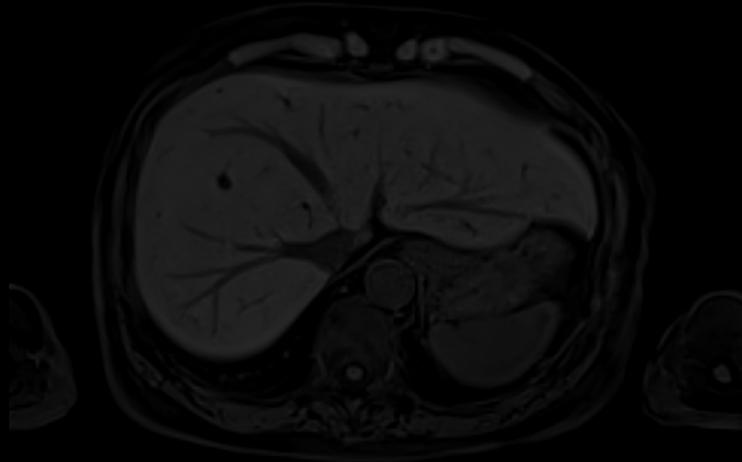
# Embrace new clinical capabilities at 1.5T

## Grant more patients access to advanced MRI

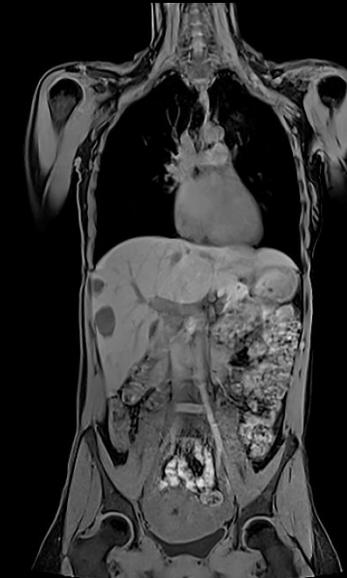
Cardiac imaging



Liver imaging



Whole-body imaging



Increasing number of indications  
for MR

+16% per year<sup>1</sup>

New in Myeloma guidelines

<sup>1</sup> IMV Market Report, 2015.

# Guidelines are changing in favor of whole-body MRI

JOURNAL OF CLINICAL ONCOLOGY SPECIAL ARTICLE

## Role of Magnetic Resonance Imaging in the Management of Patients With Multiple Myeloma: A Consensus Statement

Meletios A. Dimopoulos, Jens Hillengass, Saad Usmani, Elena Zamagni, Suzanne Lentzsch, Faith E. Davies, Noopur Raju, Orhan Sezer, Sonja Zweegman, Justin Shah, Ashraf Badran, Kazuyuki Shimizu, Philippe Moreaux, Chor-Sang Chim, Juan José Lahuerta, Jian Hua, Artur Barczak, Hartmut Goldschmidt, Peter Sonneveld, Antonio Palumbo, Heinz Ludwig, Michele Cavo, Bart Barlogie, Kenneth Anderson, G. David Roodman, S. Vincent Rajkumar, Brian G.M. Duric, and Evangelos Terpos

See accompanying editorial doi: 10.1200/JCO.2014.59.5066

**ABSTRACT**

**Purpose** The aim of International Myeloma Working Group was to develop practical recommendations for the use of magnetic resonance imaging (MRI) in multiple myeloma (MM).

**Methods** An interdisciplinary panel of clinical experts on MM and myeloma bone disease developed recommendations for the value of MRI based on data published through March 2014.

**Recommendations** MRI has high sensitivity for the early detection of marrow infiltration by myeloma cells compared with other radiographic methods. Thus, MRI detects bone involvement in patients with myeloma much earlier than the myeloma-related bone destruction, with no radiation exposure. It is the gold standard for the imaging of axial skeleton, for the evaluation of painful lesions, and for distinguishing benign versus malignant osteoporotic vertebral fractures. MRI has the ability to detect spinal cord or nerve compression and presence of soft tissue masses, and it is recommended for the workup of solitary bone plasmacytoma. Regarding smoldering or asymptomatic myeloma, all patients should undergo whole-body MRI (WB-MRI); or spine

available at www.sciencedirect.com journal homepage: www.europeanurology.com

EUROPEAN UROLOGY

EAU European Association of Urology

## Platinum Priority – Prostate Cancer

Editorial by XXX on pp. x–y of this issue

### MEtastasis Reporting and Data System for Prostate Cancer: Practical Guidelines for Acquisition, Interpretation, and Reporting of Multiorgan Involvement in Advanced Prostate Cancer

□ Anwar R. Padhani<sup>a,\*</sup>, Frederic E. Lecouvet<sup>b</sup>, Nina Tunariu<sup>c</sup>, Dow-Mu Koh<sup>d</sup>, Frederik De Keyzer<sup>d</sup>, David J. Collins<sup>e</sup>, Evis Sala<sup>f</sup>, Heinz Peter Schlemmer<sup>g</sup>, Giuseppe Petralia<sup>h</sup>, H. Alberto Vargas<sup>i</sup>, Stefano Fanti<sup>h</sup>, H. Bertrand Tombal<sup>j</sup>, Johann de Bono<sup>k</sup>

<sup>a</sup>Paul Strickland Scanner Centre, Mount Vernon Hospital, Middlesex, UK; <sup>b</sup>Department of Radiology, Centre du Cancer and Institut de Recherche Expérimentale et Clinique, Cliniques Universitaires Saint-Luc, Université Catholique de Louvain, Brussels, Belgium; <sup>c</sup>Cancer Research UK Cancer Imaging Centre, Institute of Cancer Research and Royal Marsden NHS Foundation Trust, Sutton, Surrey, UK; <sup>d</sup>Department of Radiology, Medical Imaging Research Centre, University Hospitals Leuven, Leuven, Belgium; <sup>e</sup>Department of Radiology, Memorial Sloan-Kettering Cancer Center, New York, NY, USA; <sup>f</sup>Department of Radiology, German Cancer Research Centre Heidelberg (DKFZ), Heidelberg, Germany; <sup>g</sup>Department of Radiology, European Institute of Oncology, Milan, Italy; <sup>h</sup>Service of Nuclear Medicine, S. Orsola-Malpighi Hospital, University of Bologna, Bologna, Italy; <sup>i</sup>Department of Urology, Cliniques Universitaires Saint-Luc, Université Catholique de Louvain, Brussels, Belgium; <sup>j</sup>Drug Development Unit, Institute of Cancer Research and The Royal Marsden NHS Trust, Sutton, Surrey, UK

NICE National Institute for Health and Care Excellence

## Myeloma: diagnosis and management

NICE guideline  
Published: 10 February 2016  
[nice.org.uk/guidance/ng35](http://nice.org.uk/guidance/ng35)

**GUIDELINE ARTICLE**

### European Myeloma Network Guidelines for the Management of Multiple Myeloma-related Complications

Evangelos Terpos,<sup>1</sup> Martina Kleber,<sup>2,3</sup> Monika Engelhardt,<sup>4</sup> Sonja Zweegman,<sup>5</sup> Francesca Gay,<sup>6</sup> Efsthios Kasritsis,<sup>7</sup> Niels W.C.J. van de Donk,<sup>8</sup> Benedetto Bruno,<sup>9</sup> Orhan Sezer,<sup>10</sup> Annemiek Broijl,<sup>11</sup> Sara Brinçhen,<sup>12</sup> Meral Beksaç,<sup>13</sup> Alessandra Larocca,<sup>14</sup> Roman Hajek,<sup>15</sup> Pellegrino Mozzoni,<sup>16</sup> Hans Erik Johnsen,<sup>17</sup> Fortunato Marabito,<sup>18</sup> Heinz Ludwig,<sup>19</sup> Michele Cavo,<sup>20</sup> Hermann Einsele,<sup>21</sup> Pieter Sonneveld,<sup>22</sup> Meletios A. Dimopoulos,<sup>23</sup> and Antonio Palumbo<sup>24</sup> on behalf of the European Myeloma Network

<sup>1</sup>Department of Clinical Therapeutics, National and Kapodistrian University of Athens, School of Medicine, Greece; <sup>2</sup>Department of Hematology and Oncology, University of Freiburg Medical Center, Germany; <sup>3</sup>Clinic for Internal Medicine, University Hospital Basel, Switzerland; <sup>4</sup>Department of Hematology, RW University Medical Center, Aachen, Germany; <sup>5</sup>Department of Hematology, S. Giovanni Battista Hospital, University of Turin, Italy; <sup>6</sup>Department of Hematology, University Medical Center, Utrecht, the Netherlands; <sup>7</sup>Department of Hematology, Memorial Sütlü Hospital, Istanbul, Turkey; <sup>8</sup>Department of Hematology, Erasmus University Medical Center Rotterdam, the Netherlands; <sup>9</sup>Department of Hematology, Ankara University, Turkey; <sup>10</sup>Department of Hemato-Oncology, University Hospital Olštava and Faculty of Medicine OŠU, Olštava, Czech Republic; <sup>11</sup>Centro di Riferimento Oncologico della Basilicata, Istituto di Ricovero e Cura a Carattere Scientifico, Borzeto in Vulture, Italy; <sup>12</sup>Department of Hematology, Aalborg University Hospital, Denmark; <sup>13</sup>Department of Hematology, Azienda Ospedaliera dell'Annunziata, Crotona, Italy; <sup>14</sup>Department of Medicine I, Center of Oncology, Hematology and Palliative Care, Wilhelmsstrasse, Vienna, Austria; <sup>15</sup>"Sergiyevsky" Institute of Hematology and Medical Oncology, University of Bologna, Italy; and <sup>16</sup>Department of Internal Medicine II, University Hospital Würzburg, Würzburg, Germany

\*ET, MK, ME contributed equally to this work.

“MRI detects bone involvement in patients with myeloma **much earlier** than the myeloma-related bone destruction, with no radiation exposure.”

“WB-MRI can detect bone metastases in advanced prostate cancer with **higher sensitivity** than bone scans [Scintigraphy] and with at least comparable performance to choline PET/CT.”

Great Britain (NICE):  
“Consider whole-body MRI as first-line imaging.”

European Myeloma Network Guidelines: “Whole-body MRI has to be performed in asymptomatic patients.”

# myExam Whole Body Assist<sup>1</sup> – highest consistency for follow-up examinations and response assessment

## Easy, push-button workflow with myExam Whole Body Assist



The screenshot displays the following settings:

- General Parameters:**
  - Exam Strategy: Standard
  - Focus Adaptation: BH + AutoCovera...
  - Auto Bolus Detection:
  - Auto ROI:
- Breath-Hold Parameters:**
  - Breath-Hold Capability: 15 s
  - Auto Breath-Hold Commands:  English (United...)
  - Pause Between Breath-Holds: 10 s
- Coverage:**
  - Head: [ ]
  - Thorax: Focus
  - Abdomen: Focus
  - Pelvis: Focus
  - Legs: FastView

Planning of a whole body exam can be **reduced from 14 minutes** (= 34% of the exam time) **to only 2.5 minutes<sup>2</sup>** (= 8% of the exam time)

myExam Companion for MAGNETOM Sola is still under development and not commercially available yet. Its future availability cannot be guaranteed.

<sup>1</sup> For MAGNETOM Sola this term will only be used starting with SW version syngo MR XA51A which is currently under development. It is not commercially available yet. Its future availability cannot be ensured.

<sup>2</sup> Stocker D, et al. Performance of an Automated Versus a Manual Whole-Body Magnetic Resonance Imaging Workflow. Invest Radiol. 2018, doi: 10.1097/RLI.0000000000000471.

# Whole-body MRI from head to pelvis in less than 17 min scan time<sup>1</sup>

T2 HASTE STIR



VIBE DIXON W



DWI b800 MIP



T2 STIR



T1 TSE



Powered by  
Artificial Intelligence 

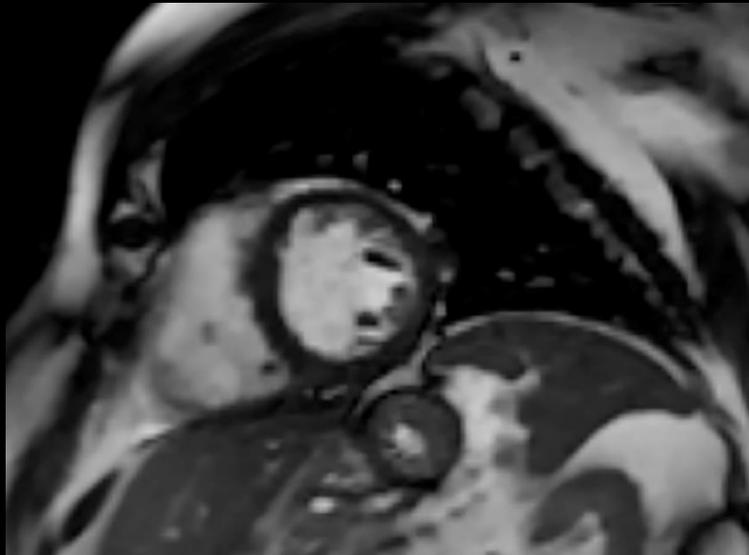
Incl. spine  
**+ 9 min<sup>1</sup>**  
to fulfill  
MET-RADS-P  
standard

Core protocol for bone and lymph node metastasis detection

<sup>1</sup> Data on file.

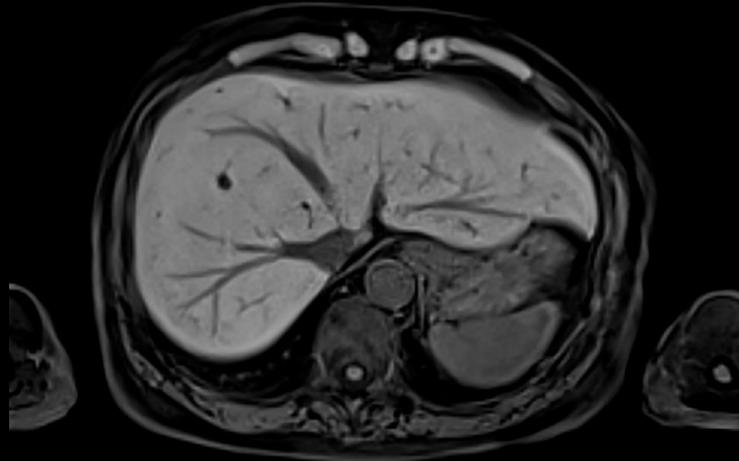
# Embrace new clinical capabilities at 1.5T Grant more patients access to advanced MRI

Cardiac imaging



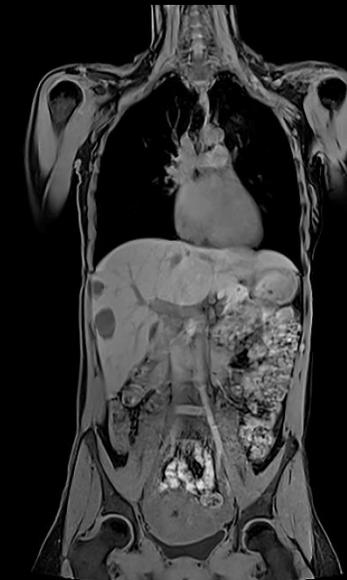
**Free-breathing Cardiac Cine and  
motion-robust scar imaging**

Liver imaging



**Free-breathing, push-button  
Liver Dynamics**

Whole-body imaging



**Push-button Whole-Body exam  
in 30 minutes**

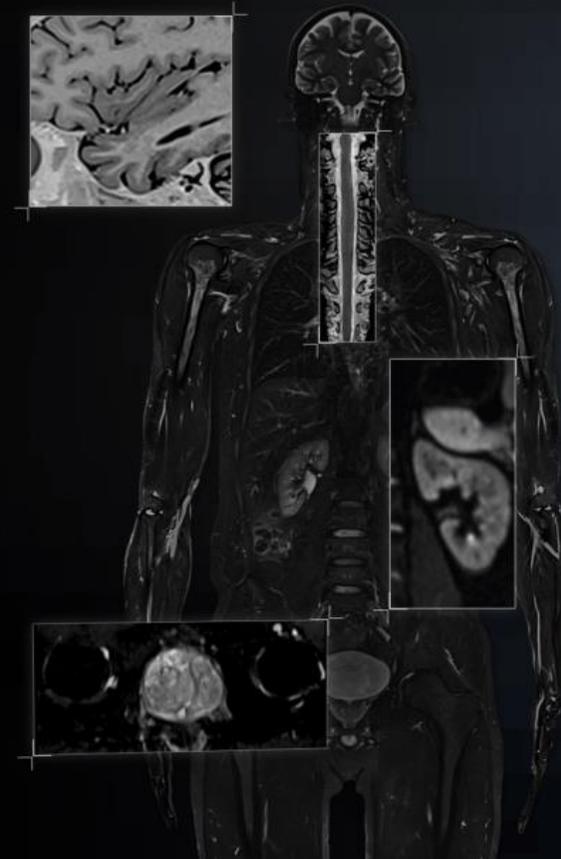
## Your choice for high-resolution

### ZOOMit<sup>PRO</sup>

#### Zoomed DWI in clinical practice

##### Your Benefits:

- Available for 1.5T systems
- Tailored for routine clinical use of high-resolution, robust zoomed DWI
- High versatility: Neuro, Breast, Prostate, Pancreas, Kidneys
- Optimized pulse sequence scheme for robustness in the presence of metal implants
- Improved Fat Suppression for clean images and excellent ADC appearance



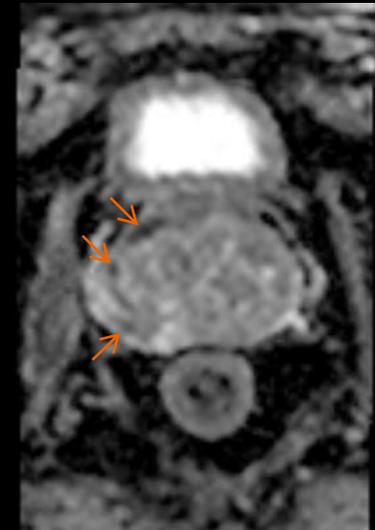
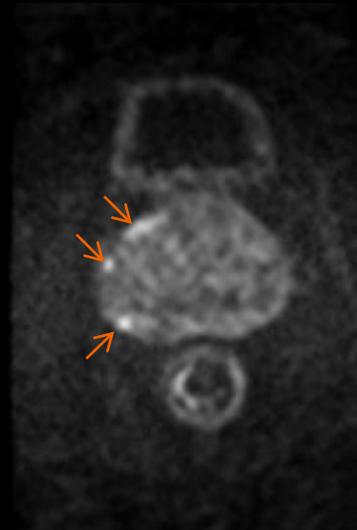
# Optimized zoomed DWI with ZOOMit<sup>PRO</sup>

## Improved visibility of small pinpoint lesions close to the capsule



### Conventional DWI

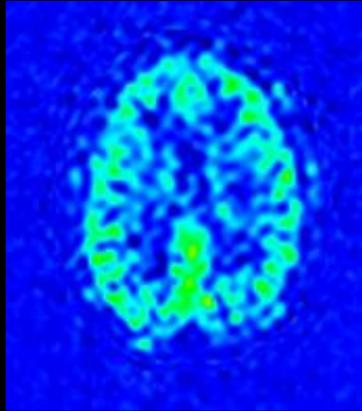
b 50, 1000, 1500, ADC, 2.1 x 2.1 x 3 mm<sup>3</sup>  
TA 3:23 min



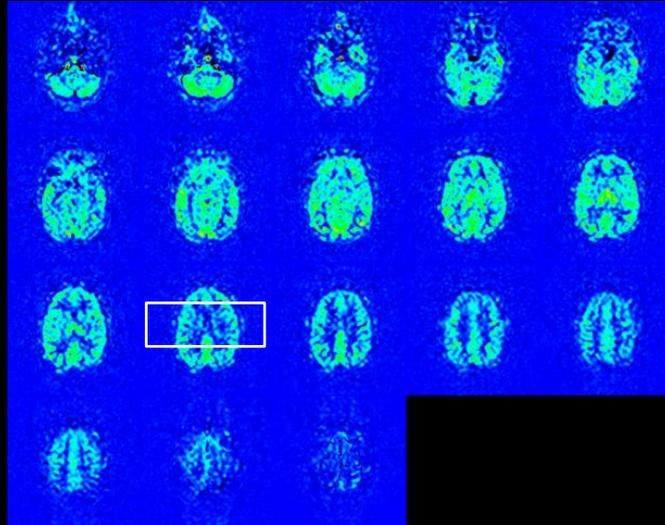
### ZOOMit<sup>PRO</sup><sup>1</sup>

b 50, 1000, 1500, ADC, 0.95 x 0.95 x 3 mm<sup>3</sup>  
TA 3:29 min

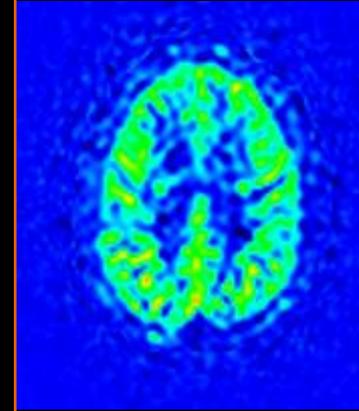
# Acquire more and thinner slices with even larger coverage and at shorter acquisition time – with PCASL



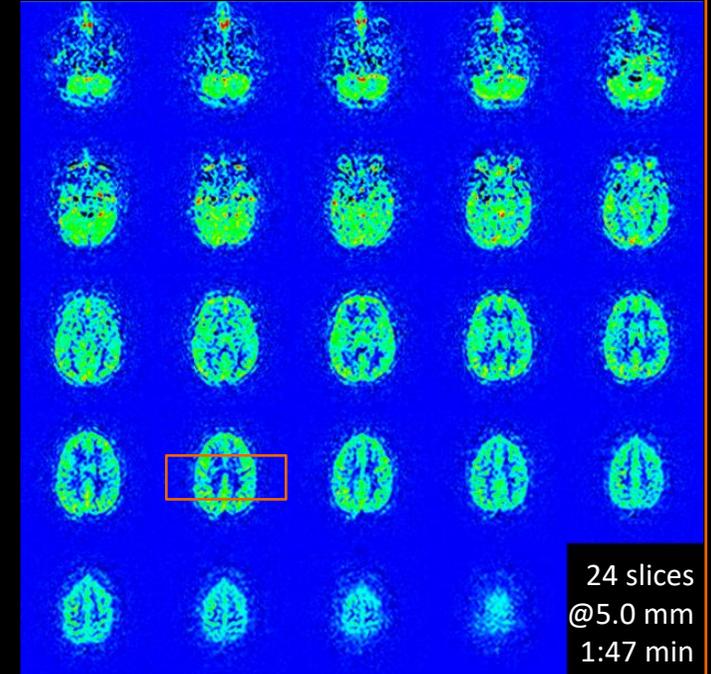
ASL



18 slices  
@5.5 mm  
1:55 min



PCASL



24 slices  
@5.0 mm  
1:47 min

Larger  
coverage

More  
slices

Thinner  
slices

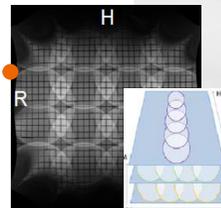
Higher  
Image  
quality

# Advance your clinical capabilities – with the MAGNETOM RT Pro edition

**MR compatible  
laser bridge<sup>1</sup>**  
for precise patient marking

**Flex, UltraFlex and  
BioMatrix coils**  
for excellent image quality

**Dedicated QA  
recommendations**



**RT Dot Engine with  
optimized RT protocols**  
for consistent scans

**RT specific coil holders**  
for proper positioning

**RT compatible indexed  
flat table tops and high  
accuracy table**  
(z positioning accuracy  
+/- 0.5 mm)<sup>2</sup>

<sup>1</sup> Optional. The information shown herein refers to products of 3rd party manufacturer's LAP and thus are in their regulatory responsibility.

Please contact the 3rd party manufacturer for further information.<sup>2</sup> Accuracy for repositioning from one direction.

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

# Highest patient satisfaction while enabling new clinical capabilities

Powered by BioMatrix Technology



# Improve patient experience with the tiltable BioMatrix Head/Neck 20 with CoilShim



0° tilt

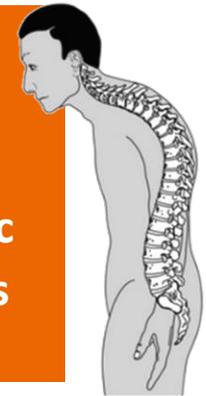


9° tilt



18° tilt

Better  
address  
kyphotic  
patients



BioMatrix

CoilShim improves  
image quality  
even in the most  
challenging situations  
e.g. in tilted exams



0° tilt Conventional  
shimming



0° tilt  
CoilShim



18° tilt Conventional  
shimming



18° tilt  
CoilShim



# Patient Experience at Siemens Magnetic Resonance

## Ease patients' anxiety with infotainment



### Innovision

Designed to revolutionize the in-bore experience



### NordicComfortPlayer<sup>1</sup>

A variety of media content options



### MAGNETOM Mini Scanner Mock-up

Let patients see, hear, and feel an MRI scan

<sup>1</sup> The information shown herein refers to products of 3rd party manufacturer's and thus are in their regulatory responsibility. Please contact the 3rd party manufacturer for further information.

# Innovision

## The in-bore infotainment solution

Innovision is designed to provide your patients with...

**High quality video experience** enriched by custom content

**Clear audio signals** with outstanding sound quality

**Efficient MRI noise reduction** from a unique memory foam pillow



**Larger bore impression** due to video display

**Patient scan time** that is indicated on the patient display



# MAGNETOM Sola – enlighten your patient’s mood individually with MoodLight

Illuminated Design Ring  
for a unique patient experience



Best New Radiology  
Device 2019



# MAGNETOM Sola with BioMatrix

## Embrace human nature at 1.5T



### Embrace consistency at 1.5T

with BioMatrix Technology

### Embrace efficiency at 1.5T

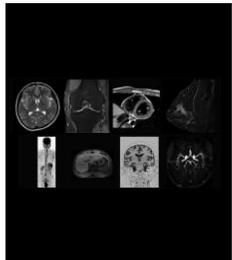
with Deep Resolve, Turbo Suite and myExam Companion<sup>1</sup>

### Embrace new clinical capabilities at 1.5T

with Inline Compressed Sensing

<sup>1</sup> myExam Companion for MAGNETOM Sola is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

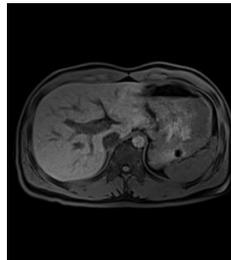
# Comprehensive hardware and software included in standard of MAGNETOM Sola



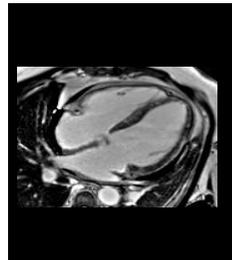
Tim Application Suites  
incl. Tim Whole-Body Suite



Quiet Suite &  
Quiet DWI



CAIPIRINHA



Advanced Cardiac incl.  
PSIR HeartFreeze



RESOLVE



myExam Companion<sup>2</sup>



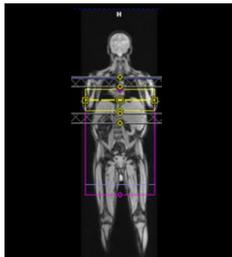
BioMatrix  
SliceAdjust



Silver&White Design  
fixed BioMatrix table



Two BioMatrix  
Select&GO  
interfaces



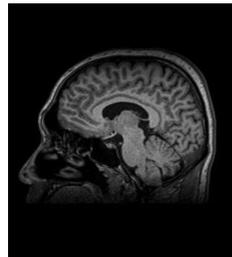
TimCT FastView



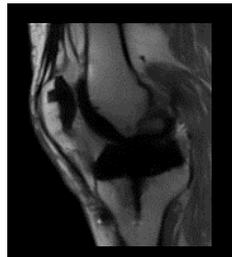
Tim Planning Suite



Inline & Offline  
Composing



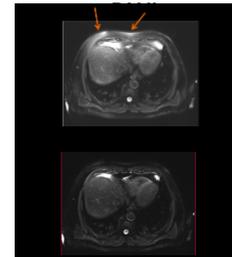
SPACE



Advanced WARP<sup>1</sup>



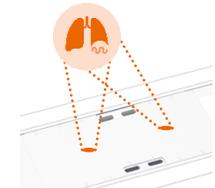
CAIPI SPACE



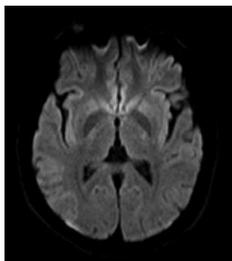
BioMatrix  
SliceAdjust TSE



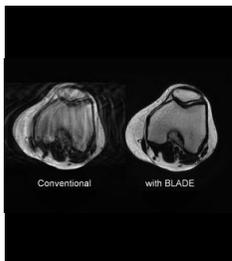
Eco-Power  
functionality



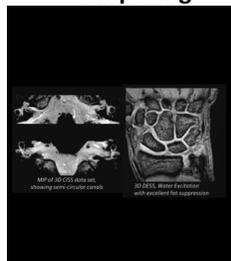
BioMatrix Sensors for  
respiratory triggering



MDDW



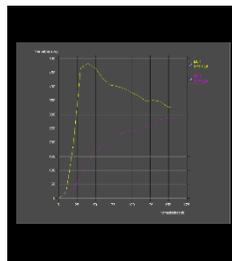
BLADE



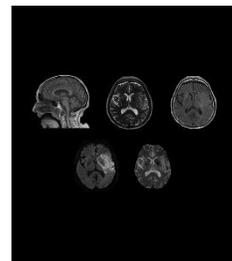
CISS/DESS



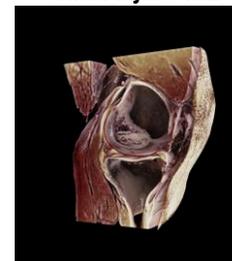
Expert-i



Mean Curve Evaluation



GOBrain / GOBrain+



GOKnee3D/ 2D



MR View&GO  
with MeanCurve, Calc. b-values, Soft-  
tissue moco, MIP generation...etc.

<sup>1</sup> 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.  
<sup>2</sup> This term will only be used starting with SW version *syngo* MR XA51A which is pending 510(k) clearance and is not yet commercially available in the United States. Its future availability cannot be guaranteed.

# Embrace new clinical opportunities with new standard and optional applications with *syngo* MR XA-line

## Address dedicated needs with trendsetting applications

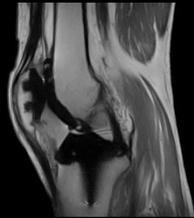
### Included in standard configuration



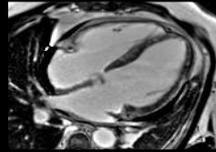
Quiet Suite



RESOLVE



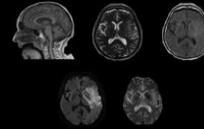
Advanced WARP<sup>1</sup>



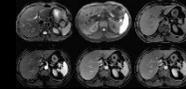
Adv. Cardiac & PSIR HeartFreeze



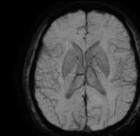
CAIPI SPACE GOKnee3D



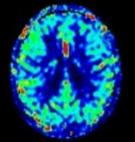
GOBrain/GOBrain+



GOLiver



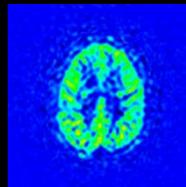
Wave-CAIPI SWI<sup>2</sup>



TGSE ASL

### Options

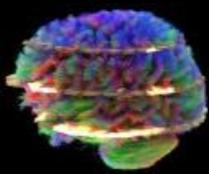
### Options



PCASL



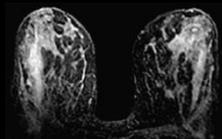
QISS



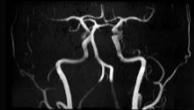
Simultaneous Multi-Slice EPI



Simultaneous Multi-Slice TSE



Simultaneous Multi-Slice RESOLVE



Compressed Sensing Time-of-Flight



Compressed Sensing SPACE



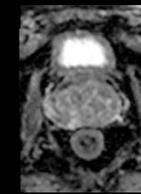
Compressed Sensing SEMAC<sup>1</sup>



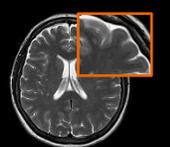
Compressed Sensing GRASP-VIBE



Compressed Sensing Cardiac Cine



ZOOMit<sup>PRO</sup>



Deep Resolve

New

<sup>1</sup> 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.

<sup>2</sup> SWI license required in addition

**Thank you.**

