PHILIPS

Radiation Oncology

Ingenia MR-RT XD
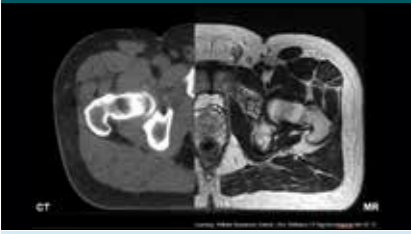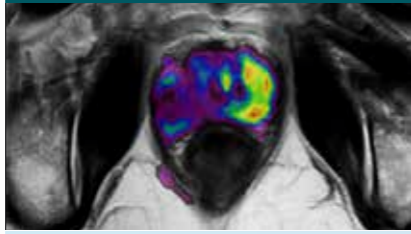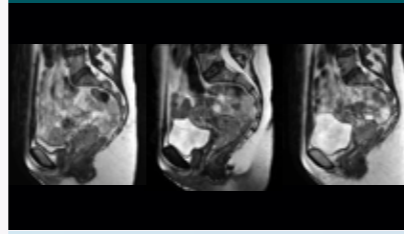
Versatility to fit your planning

Experience the
MRI difference

MRI has proven itself a key player in radiation therapy imaging – continuing its role as a powerful tool for oncology specialists to confidently address today's challenges across the oncology continuum.

With its superior soft tissue contrast compared to CT, MRI offers excellent visualization of tumor boundaries and proximity to nearby critical structures – a key factor for more confident delineation and improved treatment plans. What's more, MRI's advanced imaging capabilities can inform both target characterization and treatment response, providing you with a 'toolbox' to design personalized treatment options for each patient.

Excellent soft-tissue contrast

Excellent soft tissue contrast for visualization of targets and organs at risk

Functional imaging capabilities

Diffusion–weighted imaging for treatment response monitoring and dose painting strategies

No Ionizing radiation

Freedom to image anytime

Philips Ingenia MR-RT XD platform:

- **Meets the need for accuracy** with advances in image quality, geometric fidelity, and reproducible patient positioning

- **Streamlines workflow integration** through intuitive tools, intelligent automation, and support to excel

- **Maximizes value** across a variety of therapies and applications **through inherent versatility**

Inherent versatility
is the hallmark

The question is no longer **why** use MR in radiation therapy planning workflows, but **how** to successfully incorporate MRI into your routine clinical practice. Streamlined workflow integration and exceptional versatility are the key to success.

The Philips Ingenia MR-RT XD platform harnesses the power of MRI for radiation therapy planning and brings high-quality treatment options and confident decision-making to the next level. It has been designed around the needs of radiation oncology, with ease-of-use, streamlined integration, and versatility in mind. Central to that concept is the ability to define a tailored approach with customizable functionality that meets your individual clinical, workflow, and budgetary requirements.

With its inherent versatility, the Ingenia MR-RT XD easily adapts to different procedures, whether for EBRT, proton therapy, or brachytherapy planning. What's more, you can also enjoy the workflow benefits of MR-only radiotherapy planning, as well as the ability to conduct a full range of diagnostic quality imaging examinations. This multifunctionality has two distinct benefits – it allows you to use a single system for a broad range of clinical applications and it justifies the cost of ownership with a strong return on investment.

Dedicated for the needs
of Radiation Oncology

High quality imaging for RT with state-of-the-art Ingenia MR

Up to 50% faster RT exams with Compressed SENSE

Imaging in treatment position

Versatile patient transfer solutions with RT CouchTop XD

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Effortless, automated, geometric QA

Ideal for shared use with Radiology

MR-only radiotherapy planning with MRCAT

Synergies with Elekta Unity

Meets the **need**
for **accuracy**

Ingenia MR-RT XD meets the need for accuracy with advances in image quality, geometric fidelity, and reproducible patient positioning. You acquire high quality MR images in the treatment position, boosting accuracy in target delineation and critical structures.

State-of-the-art MRI
At the heart of Ingenia MR-RT is a state-of-the-art 70cm, 1.5T or 3.0T Ingenia MR scanner. Whichever system you choose (Ambition, Elition, Evolution) to best fit your institution's clinical and budgetary needs, you can trust that you can have access to the most recent industry advances in MRI.

Be confident in image quality
Using MR images in radiation therapy places high demands on the geometric accuracy of those images. Ingenia MR-RT accomplishes this through its industry-leading gradient linearity and advanced 3D Gradient Distortion Correction

functionality. In fact, the geometric imaging accuracy is within 1mm when measured in a 32cm volume (typical). In addition, Ingenia's dStream digital broadband architecture helps improve image quality and reduce scan times, by digitizing the signal right in the coil, for up to 40% more SNR*.

Accurate 2D or 3D — your choice
You can apply 3D geometry correction for 3D and multi-slice 2D**, and rely on high spatial accuracy in both scan modes. This gives you the flexibility to select the scan mode of your choosing, dependent on the clinical need, preference, or situation.

Position with **precision**

Highly targeted treatment plans rely on MR imaging performed in the treatment position. Yet every procedure is different, from patient to clinical needs to workflow, and each requires a personalized approach. Ingenia MR-RT XD is designed with this challenge in mind and allows for accurate, reproducible patient positioning in treatment setup – as at CT and linac.

RT CouchTop XD – targeted patient positioning
Ingenia MR-RT XD offers an advanced couchtop design. The integrated RT CouchTop XD is not an overlay, but is used in place of the diagnostic tabletop. It thereby improves SNR and frees up in-bore space by allowing positioning of the patient as close to the posterior coil as possible.

RT CouchTop XD – complete with multi-indexing
The RT CouchTop XD provides multi-indexing support, featuring both standard 14cm indexing and Elekta Unity Indexing system, 2cm increments, for one-to-one compatibility with various linacs. It accommodates a variety of MRI compatible immobilization accessories from leading vendors, including CIVCO, Orfit, QFix, and Elekta to match your procedural approach.

*Up to 40% more SNR compared to Achieva as non-digital/dStream conversion.
** Availability is dependent on the system configuration

Anterior Coil Support – simplified coil positioning
The spacious, lightweight Anterior Coil Support enables easy and flexible Anterior Coil setup. It is height-adjustable and can be tilted by a single operator to bring the coil close to the patient to maximize SNR without affecting body contours.

Its shape follows the bore dimensions providing plenty of space for patient immobilization. Whichever way patients are positioned, the open frame structure allows laser projections from virtually any direction to the target area.

Coil solutions for RT imaging

Versatile arrangements of diagnostic quality dStream coils allow you to achieve outstanding image quality with the patient in treatment position. You can perform pelvis, abdomen, brain, head/neck, and spine scans tailored for radiotherapy planning – with intuitive patient setup and minimal coil handling.

Laser positioning –patient alignment and marking
LAP DORADOnova MR3T or APOLLO MR3T laser systems allow you to align and mark your patients at the MRI scanner for enhanced MR-CT registration and a consistent patient positioning workflow across simulation and treatment.

Dedicated software keeps the external laser bridge and the MRI scanner connected. Simply activate one-click travel-to-scan, and the patient is moved from the laser system isocenter directly into the MRI system isocenter, thereby reducing workflow steps.

A one table solution
You can either use RT head immobilization with Flex coils, or the diagnostic head coil on the RT CouchTop XD – without the need to swap tables. This allows you to respond more flexibly and efficiently to different scanning needs.

Seamless **workflow integration**

To capitalize on the benefits that MR imaging can bring to planning, you need a system that fits how you work with intuitive tools and intelligent automation to drive staff confidence, simplify workflows, and reduce operator workload.

RT ExamCards enhance the view

Ingenia MR-RT XD comes with MR imaging protocols that are based on clinical insights and produce images tailored for use in radiotherapy planning – with high contrast and high geometric fidelity. These RT ExamCards help you execute scans easily and consistently and also support less experienced MR users in confident scanning.

Accelerate exams by up to 50% with Compressed SENSE

Fast overall exam-time can be achieved through Compressed SENSE. This breakthrough acceleration technique enables 2D and 3D scans up to 50%* faster with virtually equal image quality. This promotes patient comfort by limiting time in the scanner. Furthermore, it can boost productivity by allowing for additional sequences within the same timeslot or help make MR simulation imaging fit more easily into standard diagnostic time slots.
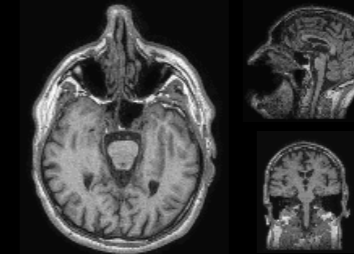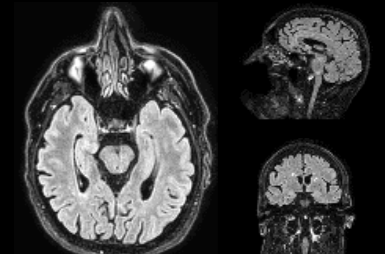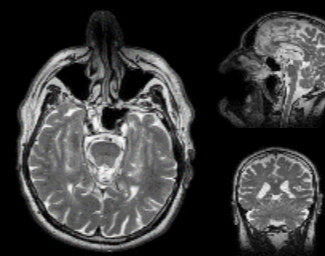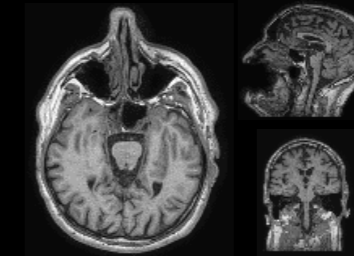
Compressed SENSE ⏱ 10:06
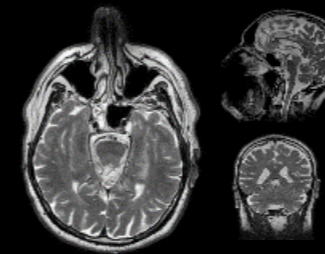
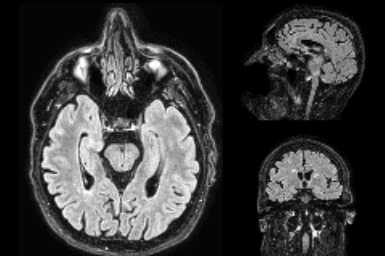T2W 3D TSE   T1W 3D TFE   FLAIR 3DView

Without Compressed SENSE ⏱ 17:50

T2W 3D TSE   T1W 3D TFE   FLAIR 3DView

* Compared to Philips scans without Compressed SENSE

Dedicated, automated **QA analysis program**

Ingenia MR-RT XD reinforces confidence in MRI quality thanks to a dedicated QA analysis program tailored for radiotherapy. The system's regular QA procedures (PIQT and geometric QA) are automated and can be easily performed on the RT CouchTop XD, so you can conduct routine evaluations in a repeatable and fast manner — and keep operator time to a minimum.

You can rely on MRI performance
You can comfortably evaluate the geometric accuracy in a large field of view with the ready-to-use QA package, which includes a phantom and analysis software. Volumetric acquisition and analysis run automatically without operator interaction. The on-console Pass/Fail analysis provides users with clear guidance on the outcome of the geometric accuracy analysis. The result is user independent and unambiguous.

PIQT

Large Field of View geometric QA

Ideal for MR-guided brachytherapy imaging
The Ingenia MR-RT XD platform helps you adopt the recommendations and guidelines for MR-guided prostate and gynecological brachytherapy, and deliver a cost-effective standard of care treatment. With short scan times, you can acquire detailed images of the anatomy and applicators for confidence in planning. And the FlexTrak patient transport solution lets you fluidly move patients from the OR to MR imaging and treatment, while they comfortably remain on the RT CouchTop XD.

Create a comforting patient environment
A unique and innovative solution, Ambient Experience is designed to offer a relaxing and pleasant sensory experience. This calming patient environment can lead to a smoother exam by providing the cancer patient with a brief distraction from their clinical state. When your patient is comfortable, your staff can focus more closely on the tasks at hand.

Powerful patient handling tools
for Ambition, Elition, and Evolution systems

VitalEye – a caring eye on your patients
With VitalEye the operator no longer needs to set up a respiratory belt, but receives a continuous and robust respiratory signal without any interaction. This revolution in patient sensing provides superior image quality* and can be used for pelvic and abdominal MR-sim exams.

VitalScreen- guidance in patient setup
The VitalScreen offers guidance and insights on the details of the current patient study. This 12-inch interactive touchscreen provides information on exam duration, which coil to use, patient positioning, physiology signal captors (EEG) and – if applicable – contrast usage and breathhold guidance.

In-bore solution - reduce patient stress
An immersive in-bore video experience distracts and entertains patients while they are in the bore, enhancing patient cooperation and workflow, and delivering an experience that reduces patient stress. This experience is available for your pelvic and abdominal RT procedures using a mirror solution that connects to the head coil base.
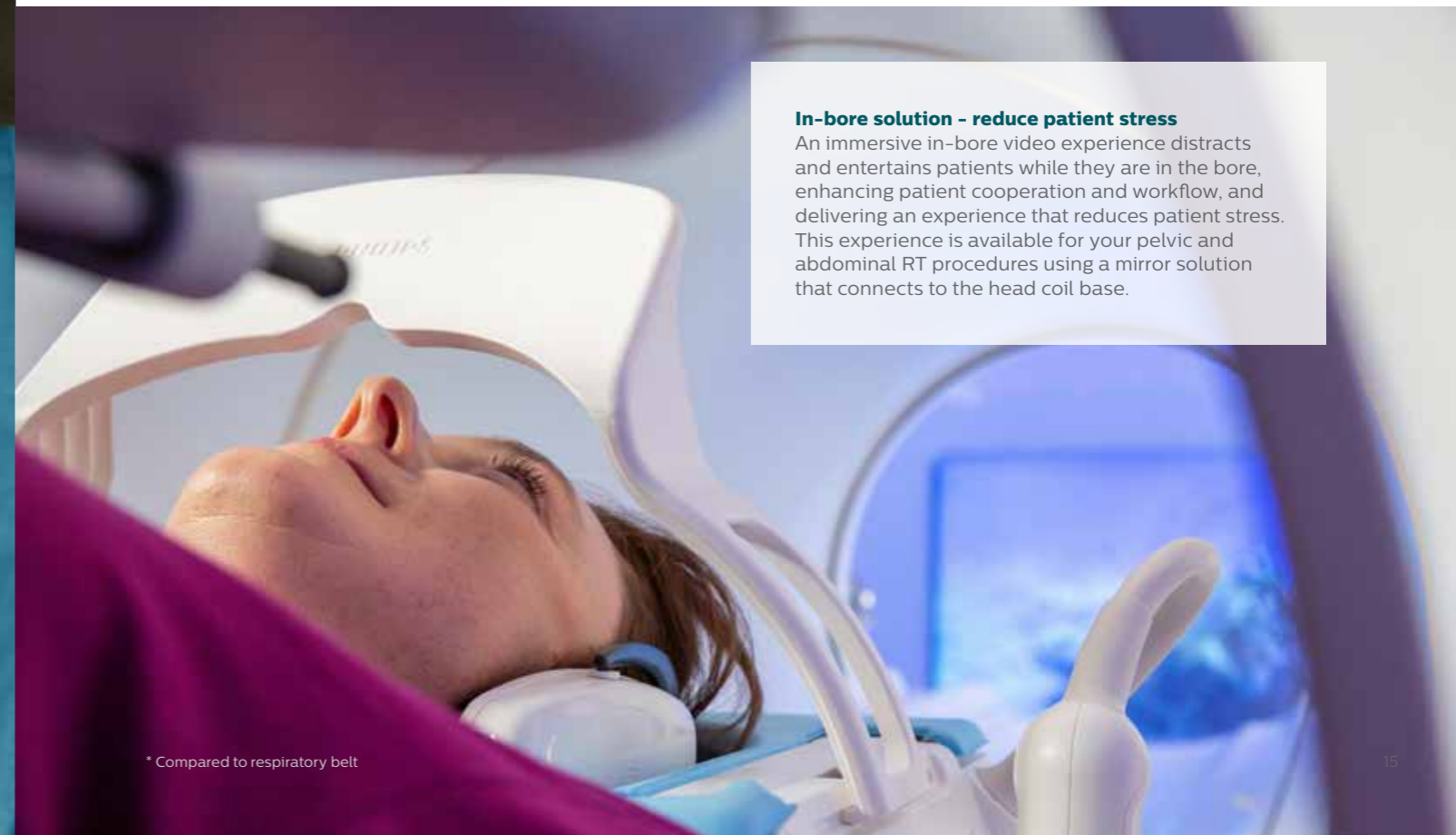
* Compared to respiratory belt

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Maximize the value of
MRI with a versatile system

You demand a solution which comfortably satisfies a wide range of requirements. One versatile MR-RT system offers this capability and helps relieve the burden on your clinical resources, reimbursement obligations, and budget.

MR-only **radiotherapy planning**

Experience the true potential of MRI in RT
The Ingenia MR-RT XD platform's MR-only radiotherapy capability turns your MR into an authentic single modality simulator. With innovative MRCAT (MR for Calculating ATtenuation) clinical applications, Philips defines the future of MR-RT and lets you plan radiation therapy based on one MR exam.

By excluding the need for CT, MR-only radiotherapy planning eliminates cumbersome and error-prone MR-CT registration, while reducing the need to coordinate scans. And your patient is spared the need to undergo a second scan – reducing the patient burden.

Philips MRCAT applications can be used for a wide range of common cancers, making them an efficient and cost-effective addition to your department.

Highlights of **Philips MRCAT**

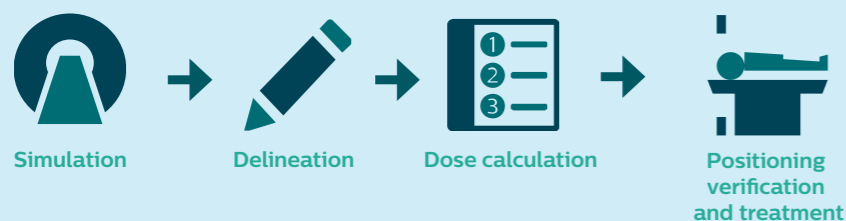

MRCAT Brain

MRCAT Pelvis

MRCAT Prostate + Auto-Contouring
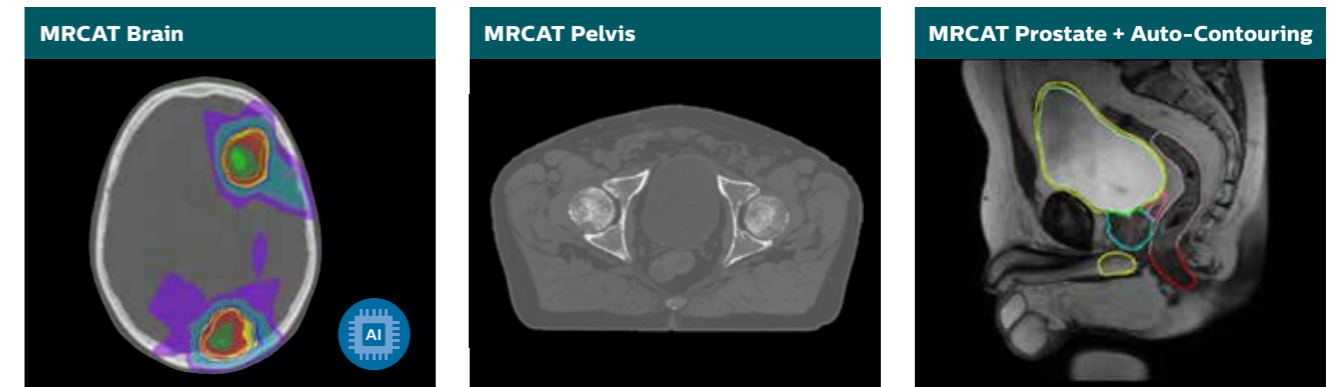
✓ Generation of **CT-like density information** right on the MR console – based on a single, standardized scan.
✓ The MRCAT source scan is **accelerated by Compressed SENSE** and takes just a few minutes to complete.
✓ MRCAT images **conform to DICOM CT** standard for automatic export to treatment planning systems.

✓ MRCAT images can be used for both **dose calculations and patient position verification.**
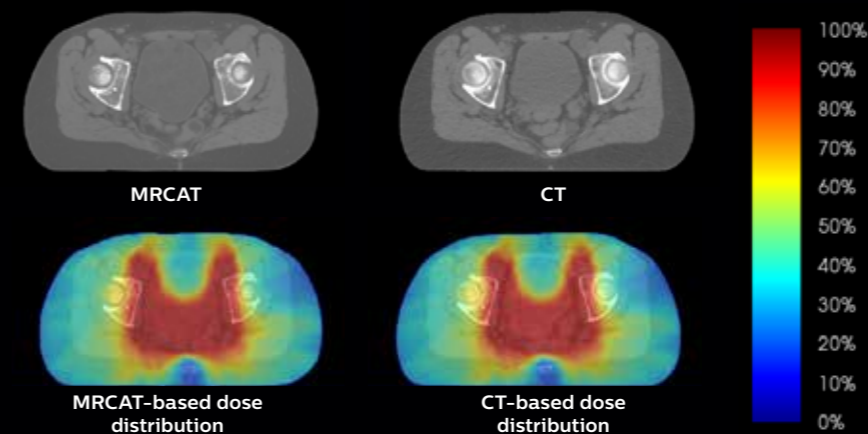✓ Automated, **MR-based contouring** of prostate and organs at risk.

MR + CT workflow

Simulation → Registration → Delineation → Dose calculation → Positioning verification and treatment
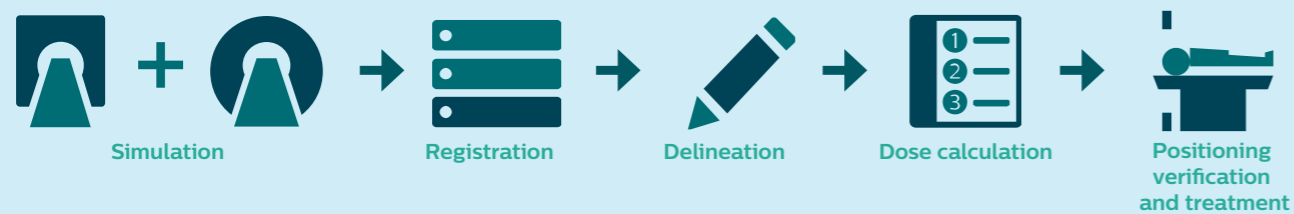
MR-only radiotherapy workflow

Simulation → Delineation → Dose calculation → Positioning verification and treatment

Studies have shown that MRCAT-based plans are equivalent* to CT-based plans.

MRCAT

CT

MRCAT-based dose distribution

CT-based dose distribution

Images acquired on Ingenia MR-RT 1.5T

*"We've successfully implemented MRI-only simulation in our clinical protocols for pelvic cancer patients. As a result, we've been able to improve efficiency, reduce dosimetric errors introduced by CT-MRI registration, and save costs by decreasing redundant imaging."*

Prof. Heikki Minn, Oncology and Radiotherapy Department Turku University Hospital, Finland

* MRCAT brain: The mean dose in the PTV does not differ more than 1% in MRCAT based plans as compared to CT based plans for 95% of the patient cases. MRCAT pelvis: The simulated dose based on MRCAT images does not differ (Gamma analysis criterion 3%/3mm realized in 99% of voxels within the PTV or exceeding 75% of the maximum dose) in 95% of the pelvic cancer patients when compared with CT-based plan for EBRT

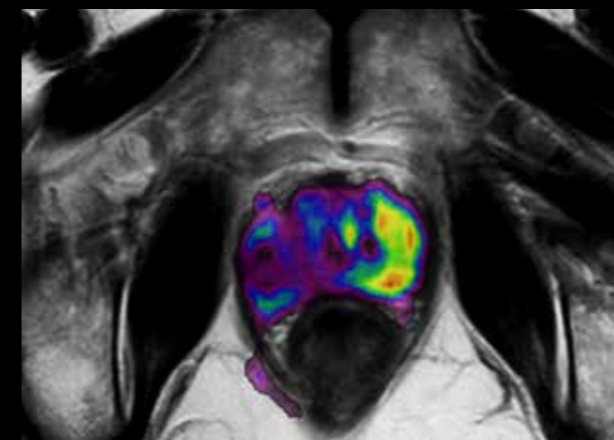# Advanced **imaging capabilities**

The Ingenia MR-RT has full diagnostic capabilities to confidently tackle your complex radiotherapy imaging challenges. Advanced imaging techniques, with protocols tailored for radiotherapy, help to refine your patient-centric planning tactics.

EPI   DWI XD TSE

Fusion of T2W anatomical images and DWi

T1W 3D VANE XD
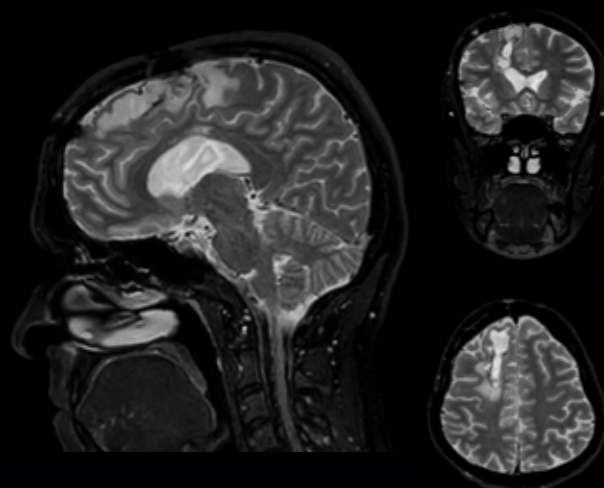
3D BrainView
As part of the MR-RT configuration, this volumetric 3D TSE imaging technique allows you to quickly see small structures in a very time-efficient manner.
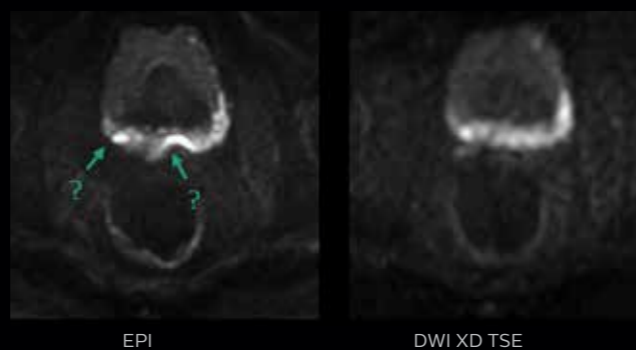
Functional imaging
Perform functional evaluation by means of diffusion, perfusion, and contrast-enhanced imaging. You can combine a variety of imaging options to conduct an advanced analysis of the treatment target volume and support your assessment of therapy response.

Less distortion in DWI*
Speed up and improve the quality of your diffusion TSE. DWI XD TSE delivers diffusion images with less distortion*.

*Compared to Philips DWI TSE
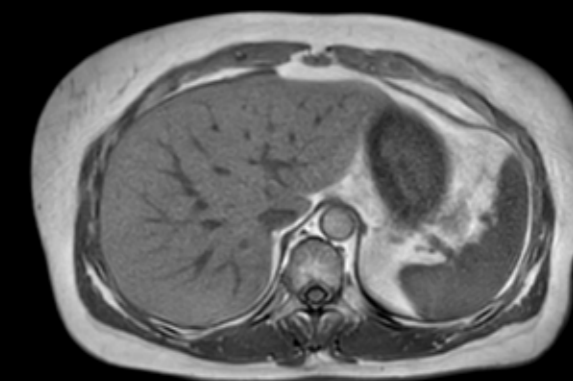
Reduce motion artifacts during free breathing
3D VANE XD supports imaging of the abdomen without the need for the patient to hold their breath, helping you reduce motion artifacts during free breathing* and improve patient comfort.
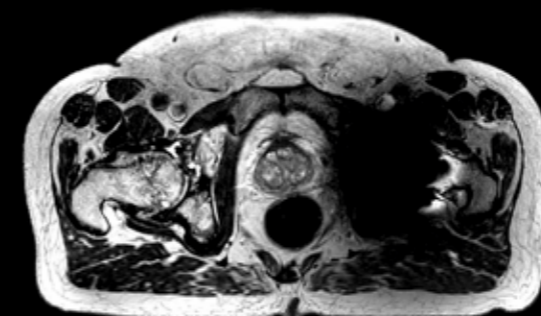
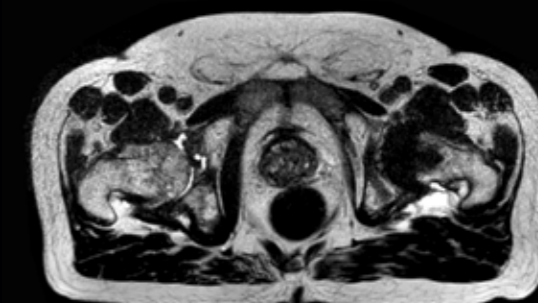* Due to radial imaging method, compared to Philips 3D cartesian imaging method
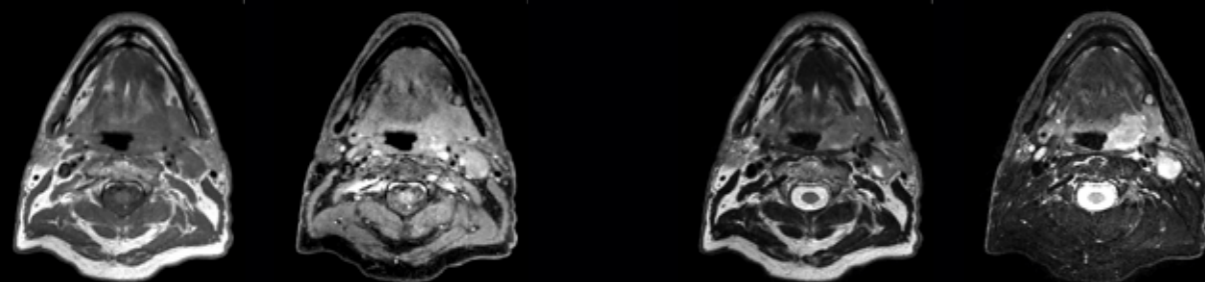
In-phase   Water-only
T1W + contrast   T1W + contrast

In-phase   Water-only
T2W   T2W

Regular T2W TSE 3D
Ingenia MR-RT 1.5T

O-MAR XD - T2W TSE 3D

Uniform and consistent fat-free imaging
The mDIXON packages provide robust protocols for multi-contrast, homogeneous and fat-suppressed imaging.

Metal artifact reduction
O-MAR XD provides efficient susceptibility artifact reduction in the vicinity of metal implants *.

* Only for use with MR Safe or MR Conditional Implants by strictly following the instructions for use.
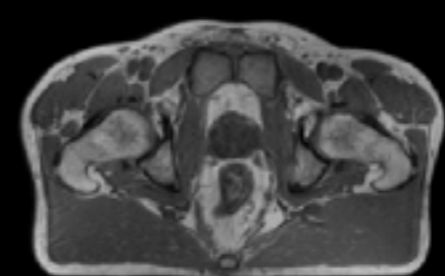
Ambition 1.5T with BlueSeal

Designed to facilitate low siting and reduce construction costs

Ambition 1.5T features a BlueSeal magnet which employs the latest micro-cooling technology for transitioning to helium-free operation. The fully-sealed magnet does not require a vent pipe and is at least 900 kg lighter in weight*. This promotes easy installation into existing radiation oncology facilities like imaging rooms or bunkers, and significantly reduces construction costs.
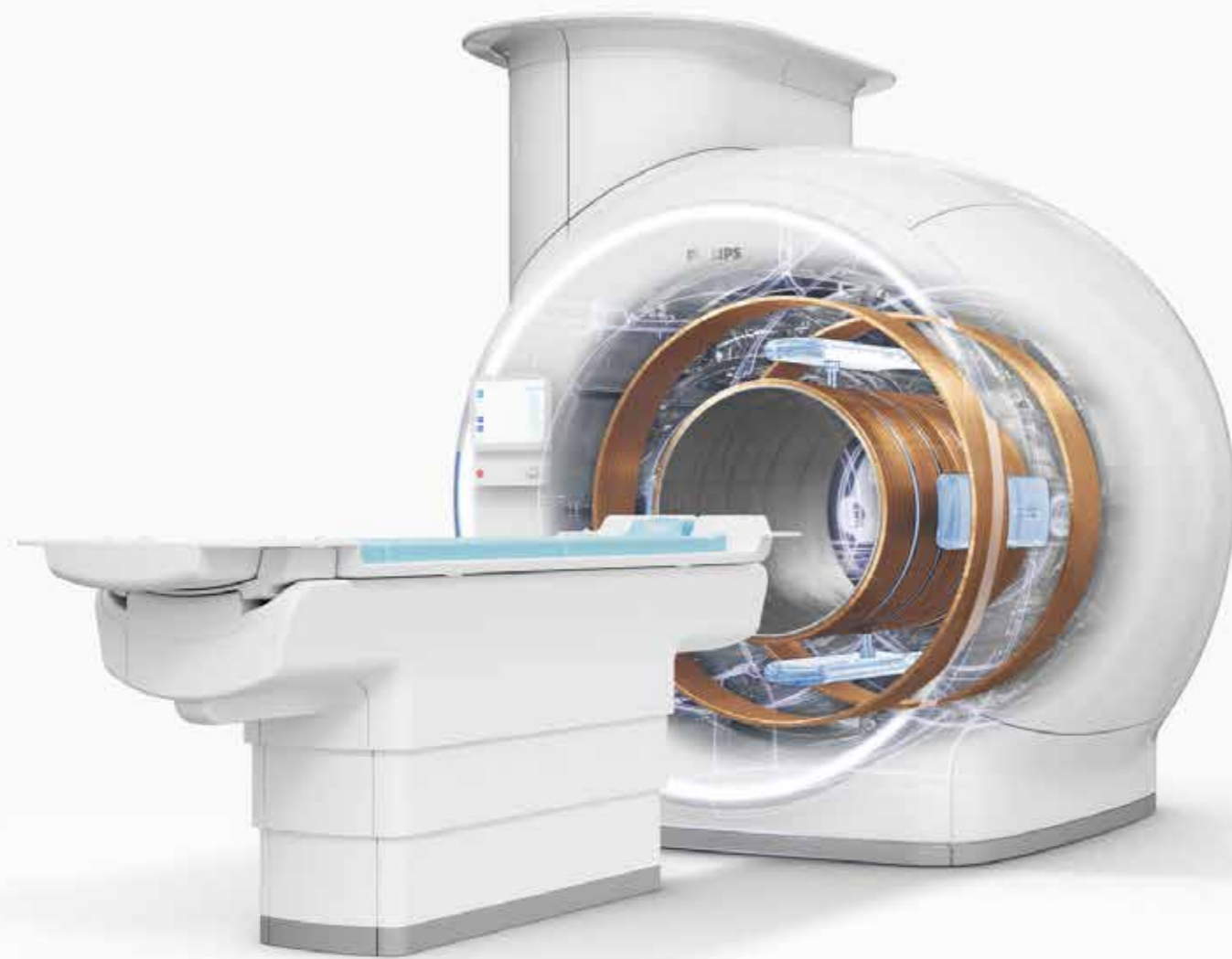
Synergies with **Elekta Unity**

The Ingenia MR-RT XD with the MR linac simulation package is an ideal complement to Elekta Unity. A common high-field image generation technology enabling similar image quality, similar MR console user interfaces, as well as similar coil setup and patient positioning workflows, enhance reproducibility, help accelerate learning curves, and drive continuity from MR simulation through to online MR guidance.

Ingenia MR-RT XD	Elekta Unity

Similarity in system architecture, MR user interface and clinical applications

Consistency across workflows with Elekta Unity Indexing system, with 2cm increments and similar patient positioning workflows

3D T1W FFE
Ingenia MR-RT 1.5T

3D T1W FFE
Image illustrative of Elekta Unity

Comparable image quality with shared core image generation technology

* Compared to Ingenia 1.5T ZBO magnet

Support to excel
Successful implementation of MRI in the RT department requires workflow modifications and staff proficiency. To address this, Philips offers a comprehensive training program and welcomes you to join our active and engaged user community to share best-practices, tips and insights. Philips is committed to advancing the use of MRI in radiotherapy by providing you with the support to excel.

A shared use system
Ingenia MR–RT XD offers you full diagnostic functionality in partnership with simulation imaging. All functionality is available for both purposes, giving you the flexibility to create a business case that works for your situation. In this way you can fully integrate Ingenia into your departmental workflow and decrease your cost of ownership.

Advancing Radiation Oncology imaging for over 25 years
As a global leader in healthcare technology, Philips knows your requirements are as dynamic as today's environment. Customers have come to rely on our history in radiation oncology breakthroughs which spans more than 25 years. Today we advance that leadership by leveraging the advantages of MRI and establishing it as a critical part of the optimized oncology care pathway.

By choosing Philips, you're choosing a partner in radiation oncology who understands your workflow. Ingenia MR–RT XD platform represents the innovation you've come to expect from Philips.

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