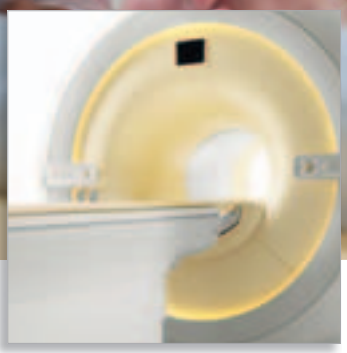


Make a leap in performance

Philips Achieva 3.0T TX with MultiTransmit technology

PHILIPS

MultiTransmit: expanding your capabilities in high-field MRI

3.0T imaging is fast developing into the system of choice for mainstream MRI. First used primarily for neuro and musculoskeletal imaging, where its high signal provided excellent image quality with high resolution and speed, its use is now rapidly growing into other areas such as breast, body and cardiac imaging.

Fueling this growth are ground-breaking developments by Philips. Developments such as compact high-field magnet technology, FreeWave 32-channel data acquisition technology, and SENSE parallel receive technology. And these firsts are now being followed by another first – MultiTransmit parallel transmit technology featured in the Philips Achieva 3.0T TX.

No two patients are alike

By using multiple RF sources, MultiTransmit can adapt the RF signals to each individual patient to improve image uniformity and increase overall imaging consistency. This is particularly important for breast and body imaging, where image uniformity and consistency at 3.0T can be a challenge. What's more, with multiple RF sources, MultiTransmit allows up to 40% increase in scanning speed.

A technology unique to the Achieva 3.0T TX, MultiTransmit takes high-field MRI to the next level of clinical excellence, further driving its growth into new application areas. So if you're currently considering moving from 1.5T to 3.0T or if you're already working with 3.0T, investing in the new Achieva 3.0T TX will take you to the cutting edge of high-field MRI. Allowing you to confidently expand your range of applications into the 3.0T growth areas of breast, body and cardiac imaging.

In short, an investment in the Achieva 3.0T TX will help you advance to the forefront of clinical diagnostics.

3.0T firsts from Philips

2000

Intera 3.0T
First compact whole body 3.0T in the industry.

2001

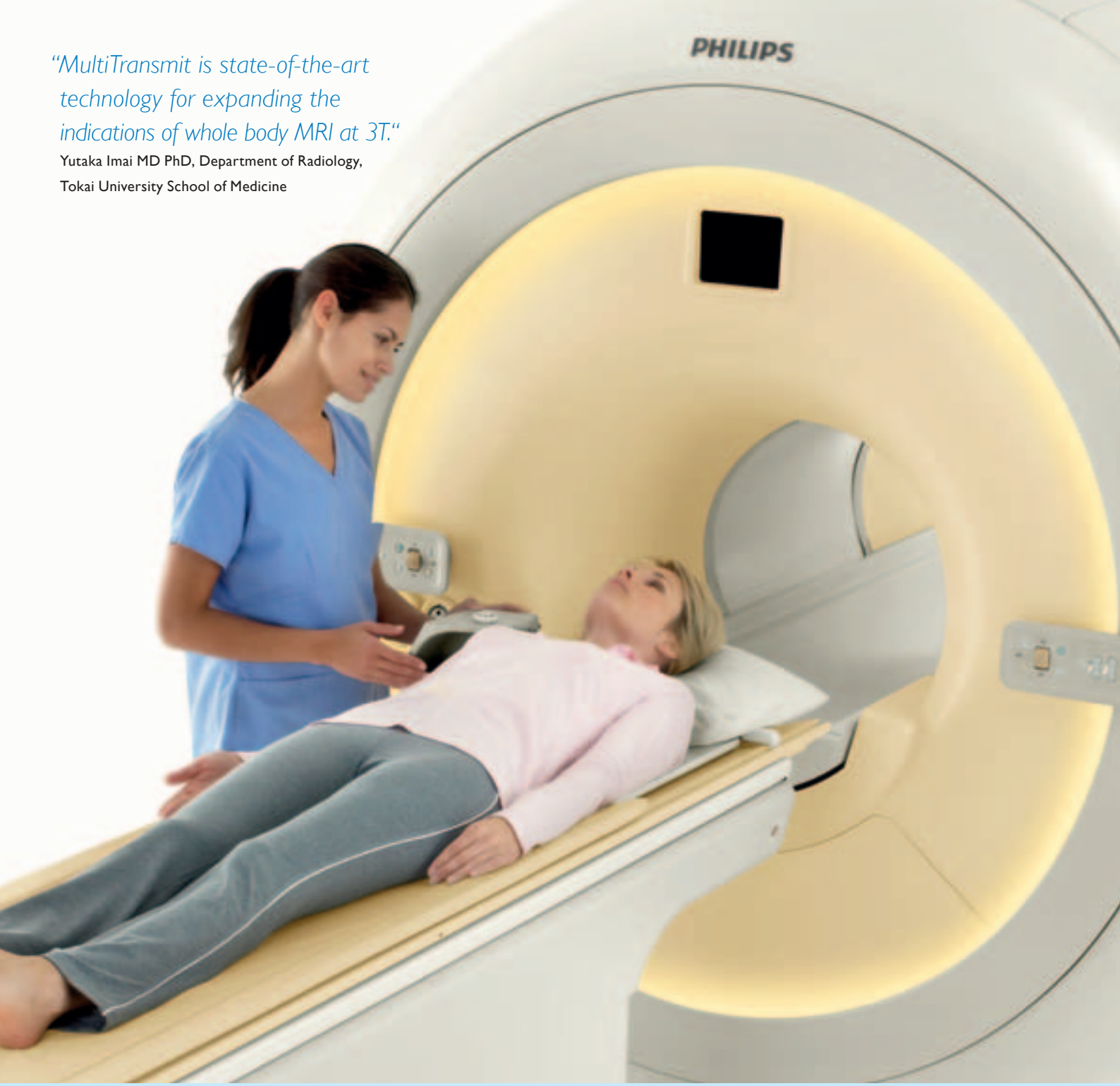
SENSE
First 3.0T with parallel receive technology.

2003

Achieva 3.0T
Achieva 3.0T with FreeWave 32-channel technology.

"MultiTransmit is state-of-the-art technology for expanding the indications of whole body MRI at 3T."

Yutaka Imai MD PhD, Department of Radiology,
Tokai University School of Medicine



2005

SmartExam
First to introduce SmartExam technology at 3.0T.

2006

X-series & Mobile
X-series technology. First MR with most compact, lightest 3.0T magnet with large FOV. First Mobile 3.0T in the industry.

2008

TX with MultiTransmit
First MR with MultiTransmit parallel transmit technology.

Experience the power of MultiTransmit

The result of an extensive development program within Philips dedicated to overcoming fundamental challenges associated with high-field MRI, MultiTransmit is state-of-the-art that's now a reality in the Achieva 3.0T TX.

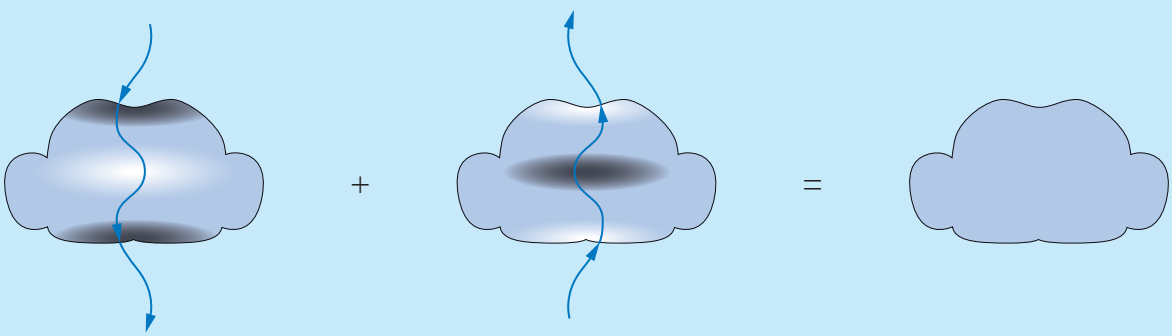
Conventional MRI scanners use only a single source to transmit a signal to the patient. Because of this, imaging large body parts at 3.0T is sometimes challenging due to what's known as dielectric shading. This produces a variation in contrast over an image and in consistency of imaging quality from patient to patient.

By using multiple RF sources, MultiTransmit reduces dielectric shading effects, rather like two lamps on either side of an object reduce the shadow cast by the object. This results in significantly better image uniformity and better consistency. Each RF source is individually adapted to each patient's unique anatomy and automatically optimized to cancel out the dielectric shading of the other source.

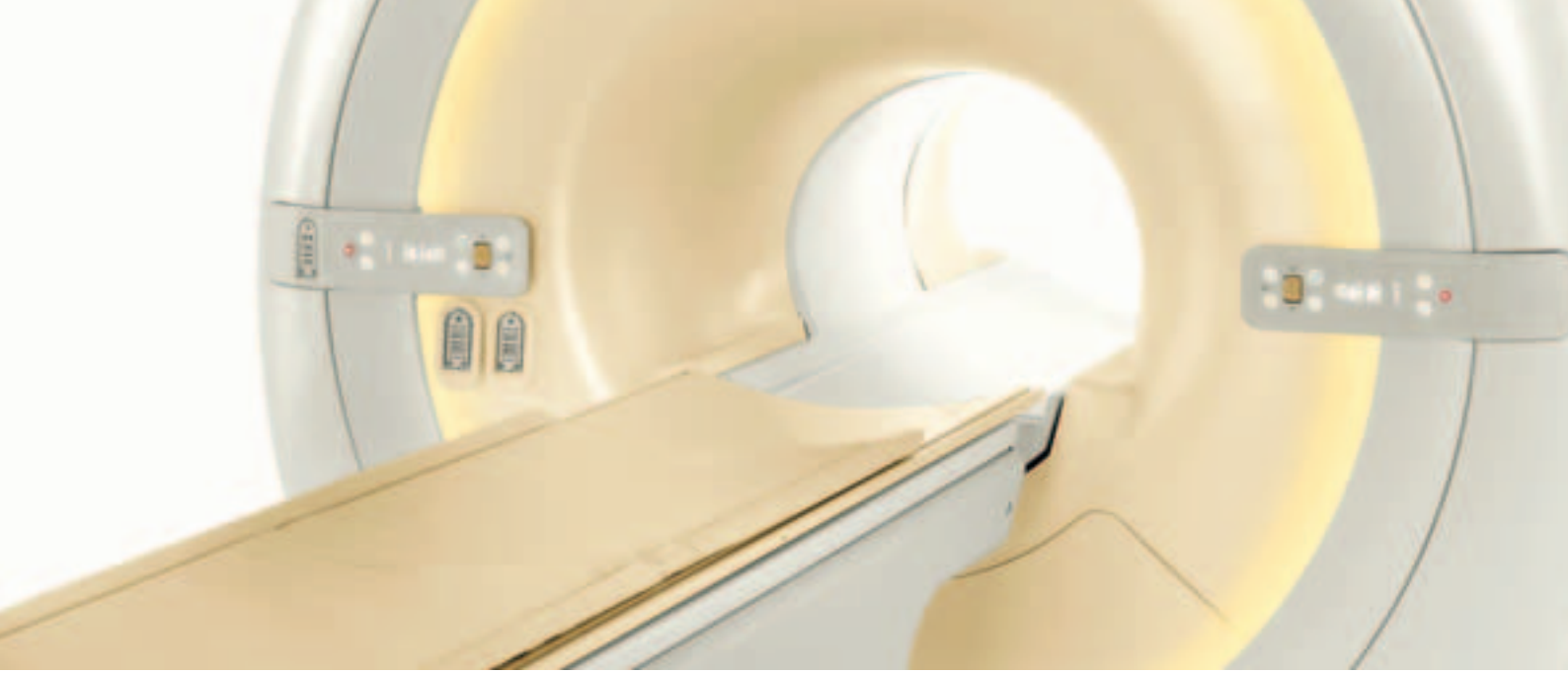
What's more, by using multiple RF sources, MultiTransmit can reduce local Specific Absorption Rate (SAR) and takes advantage of optimized RF management – enabling the system to be driven harder without the need for saline bags and interleaved sequences that are sometimes necessary with single-transmission high-field systems.

The result – increases in scanning speed by up to 40%. A total 3-stage spine exam can now be reduced from 34 minutes to 24 minutes, which makes the exam much easier for patients who may find it difficult to remain still.

MultiTransmit with multiple RF sources



In contrast to conventional MRI scanners, the Achieva 3.0T TX uses two RF sources that can be independently adapted to each patient's unique anatomy to reduce dielectric shading and enhance image uniformity.



…plus all the benefits of proven 3.0T technology

Besides MultiTransmit, the Achieva 3.0T TX embodies all the pioneering technology that has made Philips' Achieva 3.0T systems the benchmark in high-field MRI, with the largest installed base of compact 3.0T systems in the world.

The system's highly patient-friendly flared-bore magnet boasts the shortest tunnel length in the industry and a full-sized 50 cm FOV. And unique to the Achieva 3.0T TX, the magnet features a new Ambient Ring that lights up the entrance to the bore to help set patients at ease and further enhance their scanning experience. The system's exclusive Quasar and Quasar Dual gradient systems offer gradient amplitudes up to 80 mT/m to provide industry-leading performance with excellent linearity.

What's more, the scanner's integrated RF body coil delivers high SNR, optimized SAR and excellent RF uniformity. Combined with MultiTransmit, this unique system enables excellent body imaging as well as ultra-fast scanning. Peripheral MRA and total body multi-station exams can also be performed without sacrificing patient comfort. Moreover, in common with its cousins in the Philips 3.0T range, the new Achieva 3.0T TX boasts the most complete range of dedicated SENSE RF coils in the industry, to allow optimum S/N and image quality.

And of course, at the heart of the Achieva 3.0T TX system is Philips' FreeWave 32 channel data acquisition system. FreeWave is designed to handle the large data streams of ultra-high resolution imaging and to combine a variety of acceleration methods for ultra-fast imaging, such as Philips' 4D-TRAK and k-t BLAST. This advanced engine provides the power with which the Achieva 3.0T TX handles any task with ease.

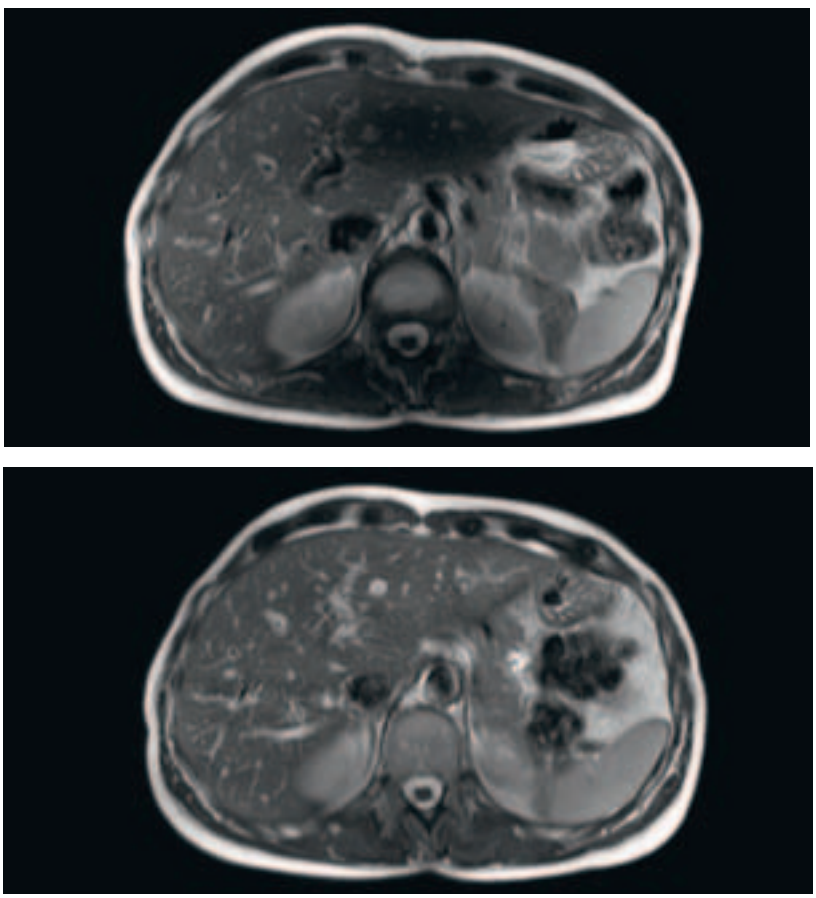
A benchmark in clinical excellence

With its state-of-the-art MultiTransmit technology, the Achieva 3.0T TX delivers enhanced levels of clinical performance in a wide range of applications. Image quality is improved with a clarity and uniformity that completely addresses the dielectric shading effect.

The high degree of image consistency also means there's less variation from patient to patient. So you can expect more consistent results in all body types. And with up to 40% faster protocols, the Achieva 3.0T TX gives you higher speed in scans that are subject to speed constraints in single-transmit systems. All of which translates into faster throughput with fewer retakes.

Achieva 3.0T systems embodying Philips' state-of-the-art 3.0T solutions are already at the forefront of neurological and musculoskeletal imaging. Now the Achieva 3.0T TX with MultiTransmit raises the bar for other applications. Breast, body and other scans can all benefit from the speed and enhanced image quality of 3.0T TX scanning.

Enhanced uniformity

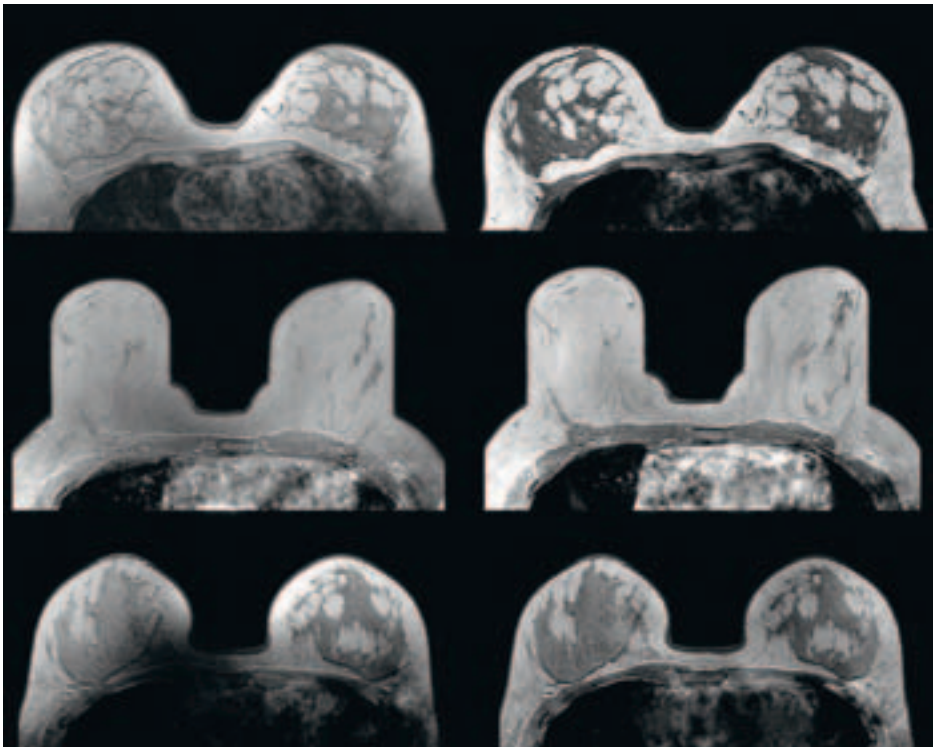


Upper image: Conventional 3T. Lower image: Achieva 3.0T TX with MultiTransmit.
Enhanced signal and contrast uniformity in liver imaging.

"Using MultiTransmit technology, B1 inhomogeneity clearly decreases and lesion visualization significantly improves. This is especially true in patients with ascites."

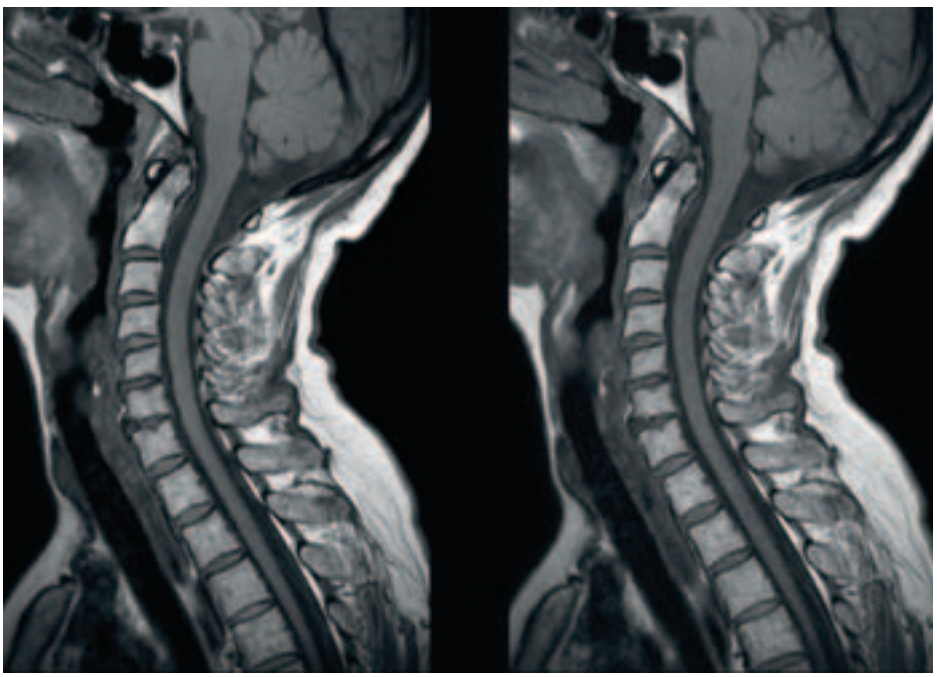
Dr. Guido Kukuk, University of Bonn

Enhanced consistency



MultiTransmit enables consistent uniform image quality to assist with a confident diagnosis, patient after patient. Shown here: High-resolution 2D T1-weighted gradient echo sequences. Left: Conventional 3T. Right: Achieva 3.0T TX with MultiTransmit.

Enhanced speed



Up to 40% scan time reduction with MultiTransmit. Left image: Sagittal T2-weighted C-spine, conventional 3T, scan time 3:21 min. Right image: MultiTransmit, scan time 2:33 min.

"MultiTransmit in spine examinations yields an effective gain of time, on average 30 to 40%, with diagnostic image quality readily comparable to that of standard single transmission sequences."

Dr. Michael Nelles, University of Bonn

Advanced clinical solutions

Achieva 3.0T TX is complemented by a range of advanced clinical solutions that help you to excel in MR imaging. Available for all applications, Philips Elite Clinical Solutions form an essential part of our commitment to working closely with you to provide diagnostic and clinical support that matches day-by-day needs and working practices.

Each solution consists of a carefully tailored combination of imaging techniques, supporting coils and peripherals, and workflow support tools developed to enhance your clinical and economic efficiency.

Elite Clinical Solutions tie in very closely with today's best practices. They have been created through listening to our customers to clearly understand their needs in delivering care to patients. Our aim is to provide what you need, when you need it.

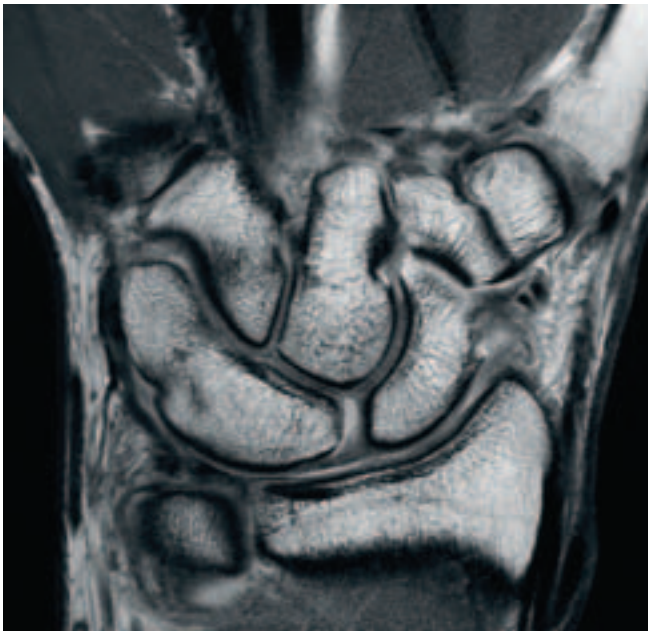
They include, for example, advanced tools such as Philips' SmartExam automatic planning, scanning and processing option, which offers consistent and reproducible images, removing varia-tions in imaging that make exams harder to read, and helping physicians read MRI studies faster.

Elite Neuro

Philips Neuro Elite brings you a dedicated MR toolkit for neuro and spine imaging. Derived from the best-in-class practices of MRI diagnostics and functional imaging in stroke, brain tumor, degenerative and autoimmune diseases, it combines new imaging techniques, acces-sories and workflows to enhance clinical confidence, diagnostic capabilities and speed of diagnostic MR imaging.

The excellent reproducibility of SmartExam Brain and SmartExam Spine makes it possible to compare the exact same slice, even with exams performed on different Philips MR systems, by different technicians and at different times.

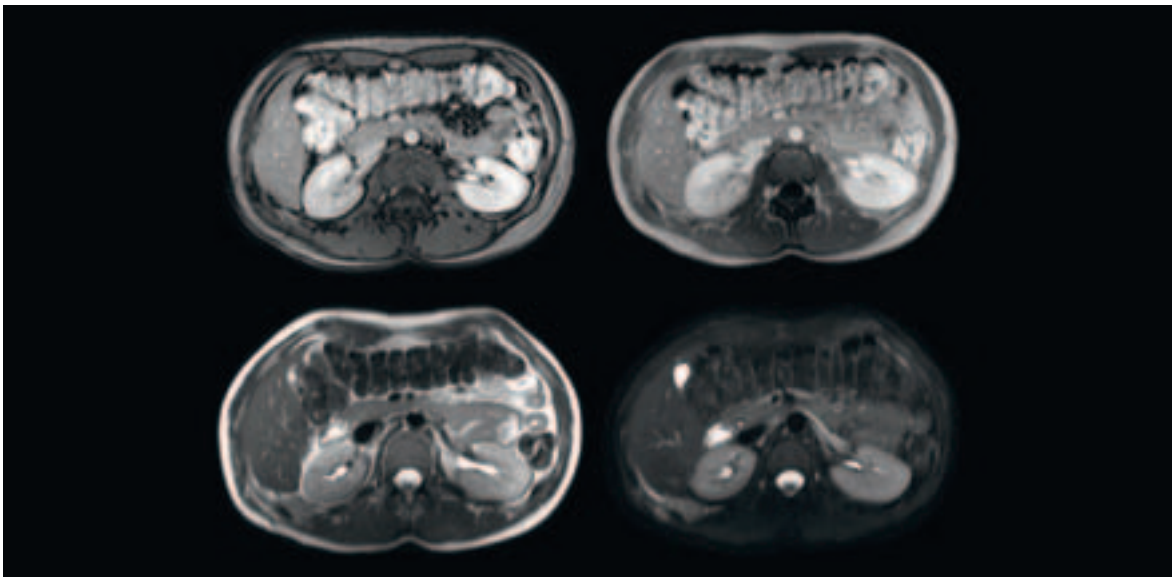
Elite Neuro also brings advanced functional solutions such as functional MRI, Diffusion Weighted Imaging, Diffusion Tensor Imaging, BOLD imaging and Multi-Phase Arterial Spin Labeling to high-field MRI.



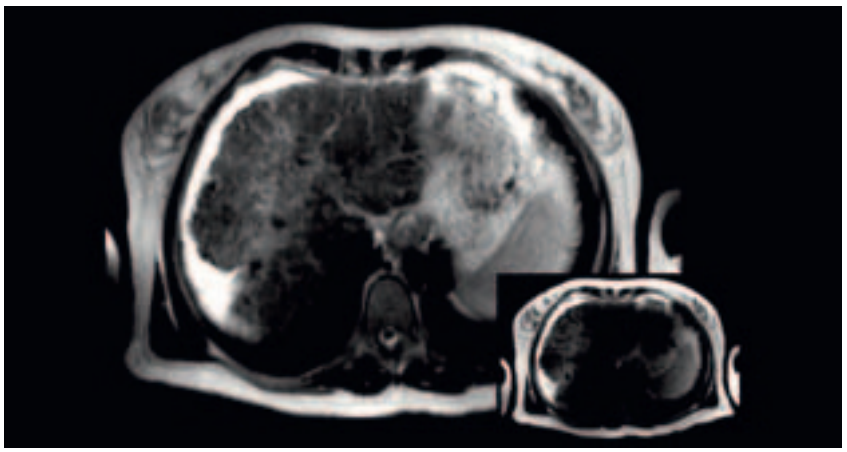
Ultra-high resolution PDW TSE wrist using a-TSE and SENSE to increase resolution and reduce scan time. 0.18 x 0.2 x 3.0 mm, 14 slices in 5:33 min.

Ultra-high resolution PDW TSE knee using a-TSE and SENSE. 0.19 x 0.25 x 3.0 mm, 24 slices in 4:40 min.

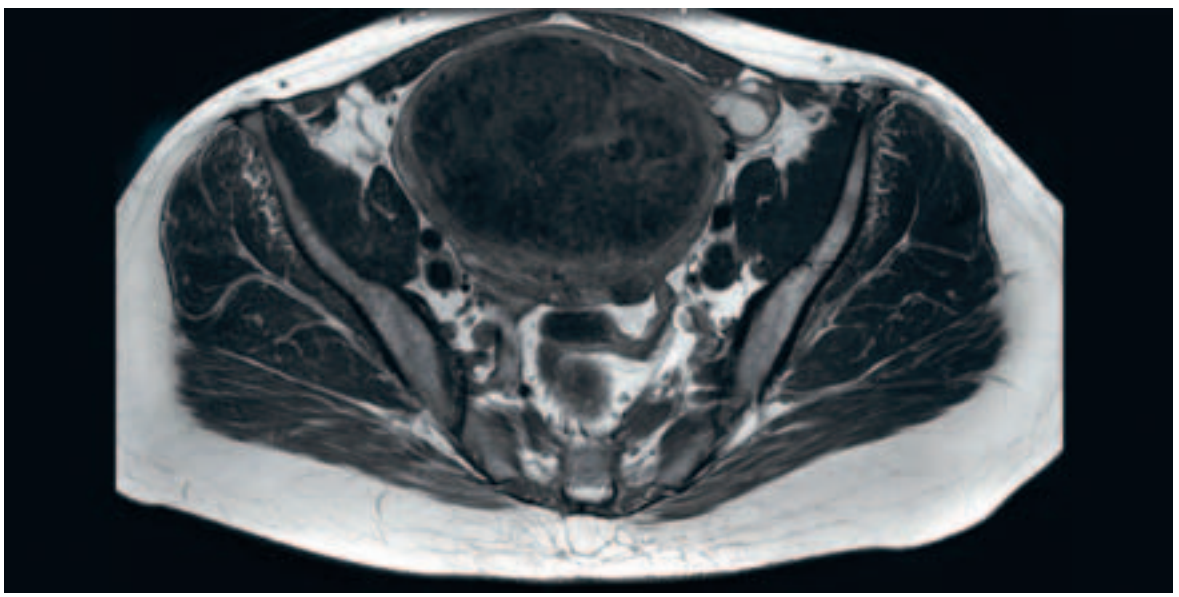
Ultra-high resolution foot imaging with large FOV, SPAIR fat-suppression and 2k Imaging. 0.2 x 0.45 x 3.5 mm, 18 slices in 5:59 min.



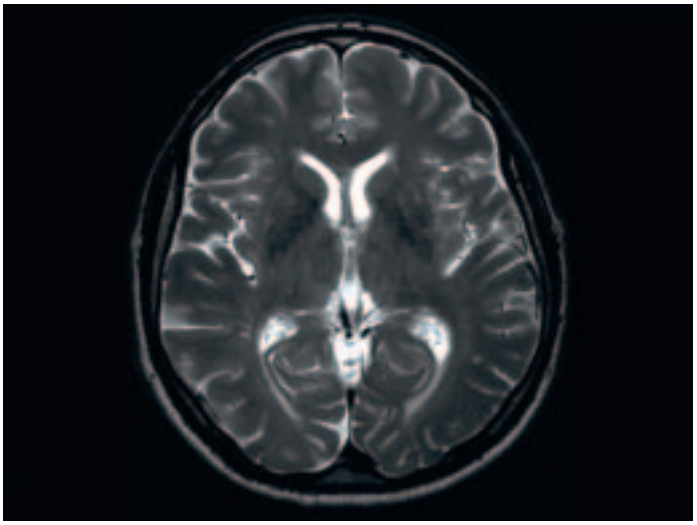
Comprehensive Liver imaging with MultiTransmit. Upper row: out- and in-phase T1W gradient echo, 1.7 x 2.4 x 7 mm, 25 slices, 14 sec breathhold. Bottom row: free-breathing SSh T2W TSE without and with SPAIR, 1.2 x 1.4 x 7 mm, 25 slices.



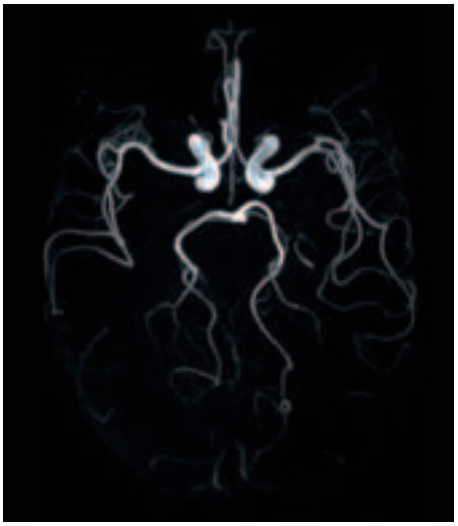
MultiTransmit effectively addresses dielectric shading, even in a patient with liver cirrhosis and ascites. Ascites patients are often challenging to image with MR due to the shielding effects of fluids. Large image: MultiTransmit. Inset: conventional 3T.



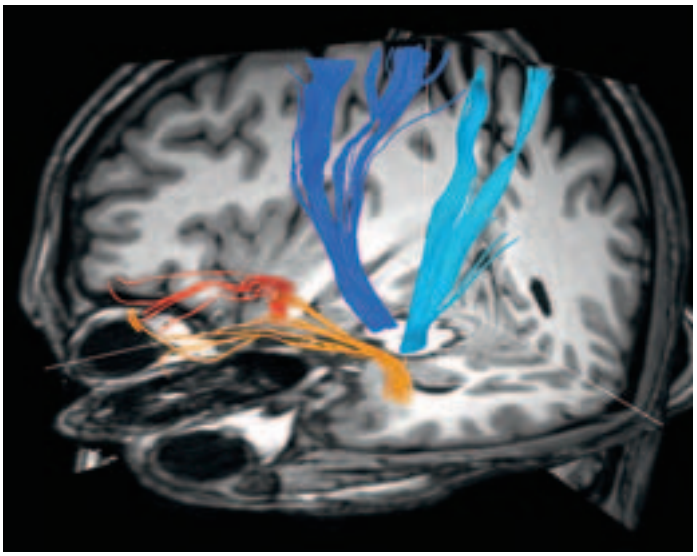
High-resolution Pelvic T2W TSE with MultiTransmit and SENSE. 0.4 x 0.4 x 4.0mm, 29 slices in 4:27 min.



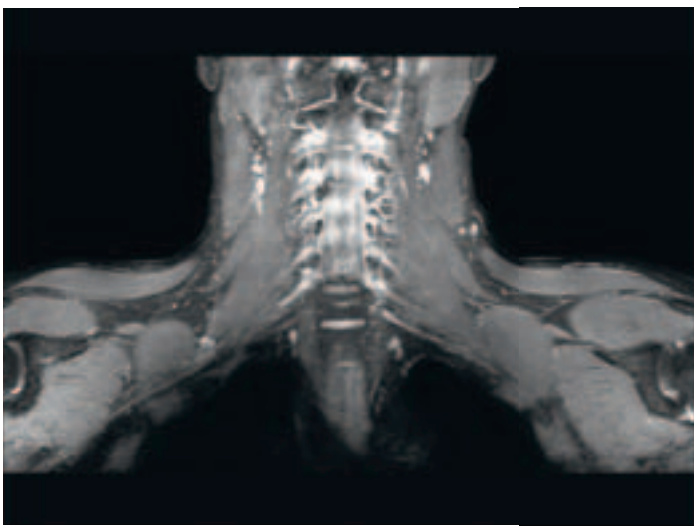
Ultra-high resolution T2W TSE. 0.20 x 0.26 x 4 mm, 24 slices.



TOF inflow MRA using SENSE. 0.4 x 0.7 x 0.6 mm, 150 slices, 4:38 min.



Easy FiberTrak imaging using DTI and SENSE. 15 directions, 2 x 2 x 2 mm, 60 slices, 4:13 min.



Fat-suppressed posterior triangle. STIR a-TSE, 0.9 x 1.3 x 3.0 mm, 21 slices, 4:39 min.

Total spine T2W TSE. 3:45 min / station.

Elite Breast

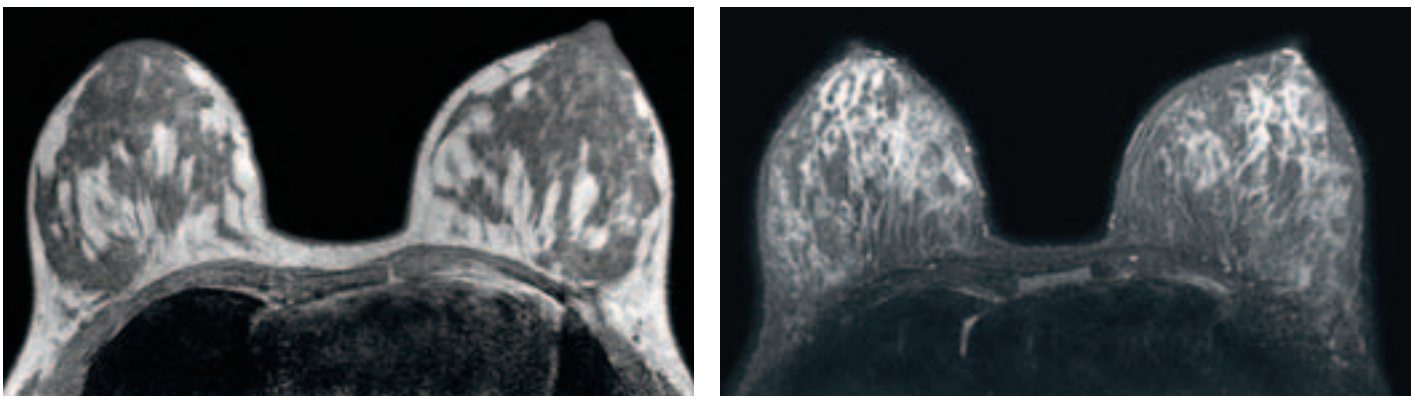
Early detection of small lesions in the breast is particularly important since this can influence treatment options. Breast imaging can benefit from the high signal of 3.0T higher spatial and temporal resolution. With MultiTransmit, fundamental challenges of breast imaging at 3.0T are addressed, leading to enhanced uniformity and consistent image quality.

Elite Breast is a comprehensive breast solution that combines SmartExam Breast, MammoTrak and DynaCAD Enterprise.

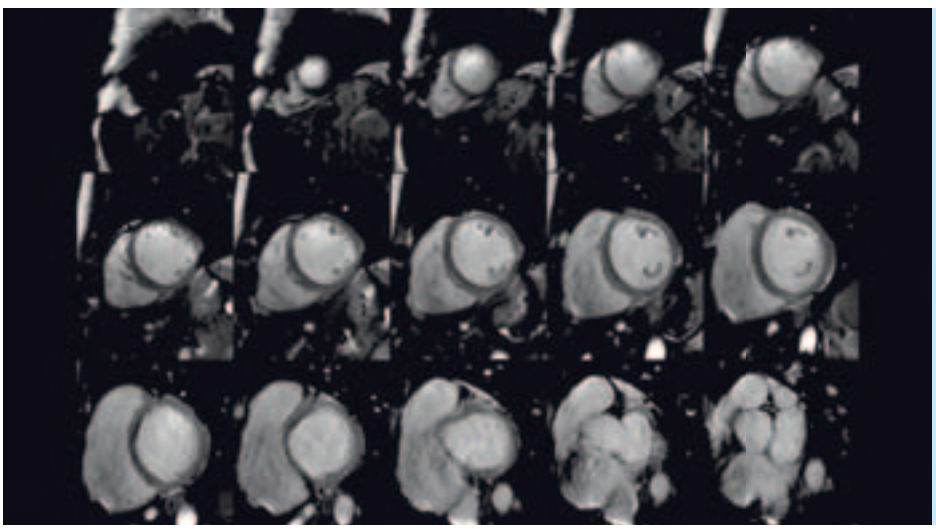
SmartExam Breast provides intelligent assistance in planning, scanning and processing for enhanced reproducibility. It also contains sophisticated shimming techniques for consistent fat saturation, thereby avoiding time consuming manual adjustments and minimizing retakes.

MammoTrak dockable patient support offers enhanced workflow, patient comfort, biopsy and imaging capabilities with dedicated breast coils. Furthermore, DynaCAD Enterprise offers streamlined biopsy planning, processing, reviewing and reporting.

MultiTransmit enables to use the full potential of 3.0T in routine clinical breast imaging. Combined with Elite Breast it provides exceptionally high quality breast imaging with best-in-class performance at 3.0T.



Breast T1W (left, 0.6 x 0.6 x 1 mm, 150 slices, 59 sec) and T2W TSE with SPAIR (right, 1.0 x 1.3 x 2.5, 60 slices, 4:34 min) using MultiTransmit and SmartExam Breast.



Equipped for the future – cardiac imaging

The Achieva 3.0T TX with its enhanced image quality and consistency is set to provide a benchmark for cardiac imaging which is likely to become become a mainstream application of high-field MRI.

Multi-slice, multi-phase B-TFE cine cardiac imaging using SENSE. 1.6 x 2.0 x 8 mm, 15 slices, 30 phases, 16s / breathhold.

The future of 3.0T today

In 2000, Philips was the first to introduce SENSE parallel receive imaging, a revolutionary step that has since been adopted by all major vendors. Now MultiTransmit parallel transmit imaging is set to become a standard that may be the future for high-field MRI.

The new Achieva 3.0T TX offers the benefits of faster scans and higher throughput with fewer retakes. Its enhanced image uniformity and consistency over a broad range of applications enables you to bring the benefits of high-field diagnostic MRI to a much wider patient population, which allows you to increase your range of referrals.

The result! A system that makes as much sense economically as it does clinically. One that promises maximum return on investment. And one that will keep you at the cutting edge of diagnostics – now and in the future.

MammoTrak Elite breast solution.

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