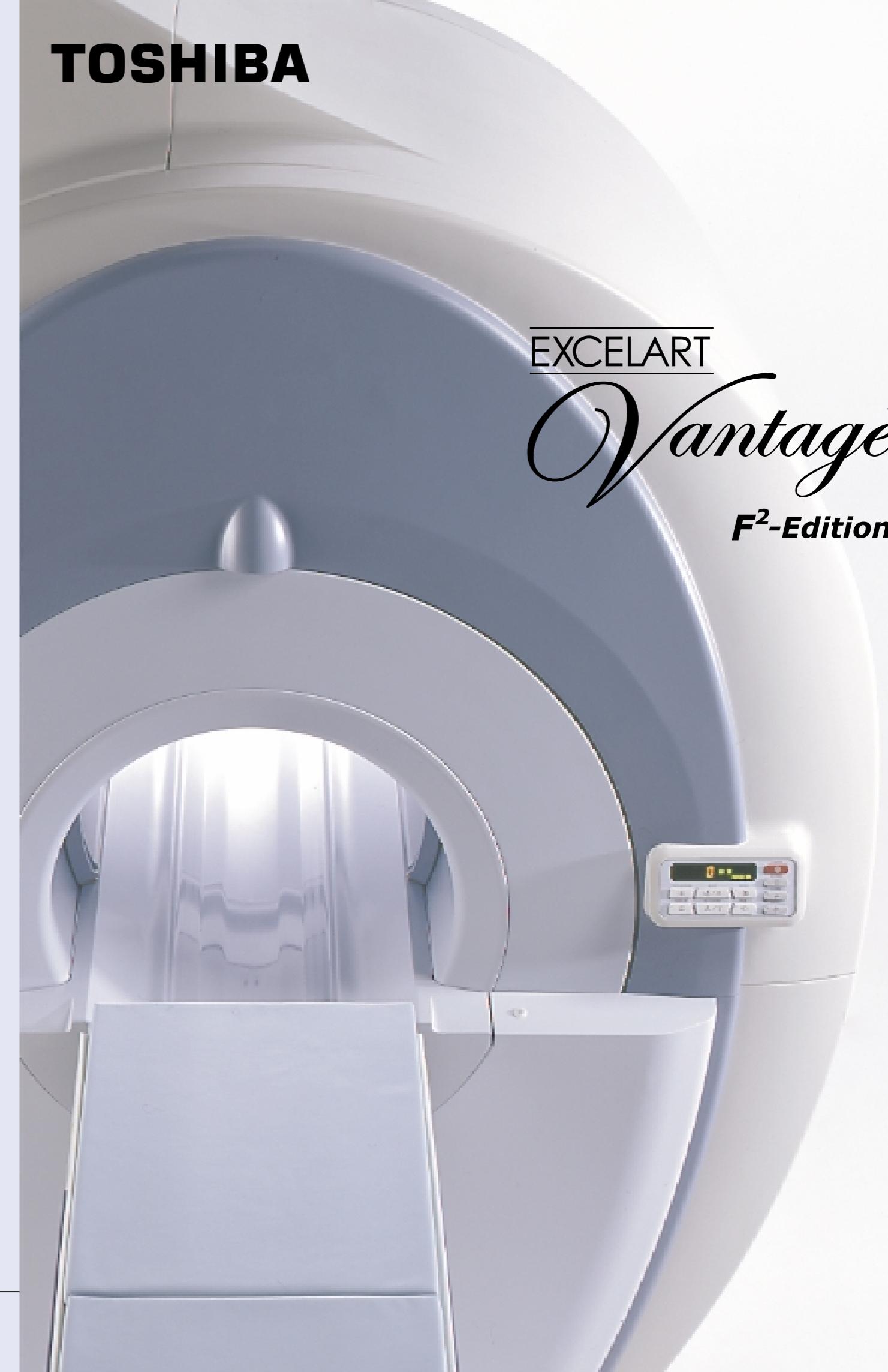


TOSHIBA

EXCELART
*Vantage*TM
F²-Edition



EXCELART
Vantage
F²-Edition



TOSHIBA MEDICAL SYSTEMS CORPORATION

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Toshiba Medical Systems Corporation meets internationally recognized standards for Quality Management System ISO 9001, ISO 13485.

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Printed in Japan

EXCELART
Vantage **F²-Edition**

Fine & Fast

Fine & Fast

Fine & Fast

Reveals more detail in a shorter acquisition time.

EXCELART Vantage™ F²-Edition.

A hardware platform with outstanding potential provides real clinical benefits. The combination of excellent image quality and remarkable speed opens up a new world of diagnostic imaging.

The patient-friendly EXCELART Vantage™
Fine & Fast — The F²-Edition advances MRI imaging to meet
the needs of the future.

F² : Fine & Fast



EXCELART
Vantage
F²-Edition

Fine

The Vantage F²-Edition offers true "Next-generation image quality".



SPEEDER

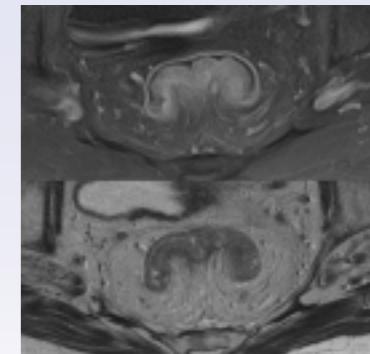
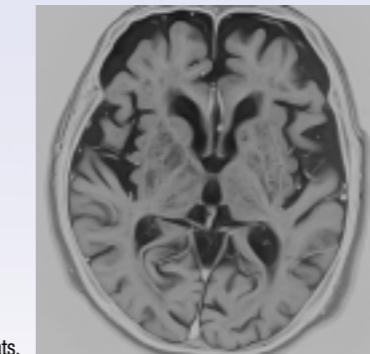
Parallel Imaging ensures unmatched image quality

Fine & Fast is based on SPEEDER technology (Toshiba's parallel imaging solution), which ensures optimal image quality and speed for each target anatomy. RF coils specially designed for SPEEDER and the most advanced imaging algorithms mean that the Vantage F²-Edition provides the highest possible image quality and expands the range of diagnostic applications.

0.5-mm Isotropic Pixels

High resolution makes it possible to visualize anatomical details that cannot be depicted using conventional systems.

Isotropic pixels with a spatial resolution of 0.5 mm ensure outstanding image quality. With a 25-cm FOV, for example, an isotropic pixel resolution of 0.5 mm can be achieved in data acquisition with a 512 × 512 matrix size, which further provides higher quality Multiplanar reformats. The following example illustrates how the high potential and wide range of features of the F²-Edition can be used to improve the spatial resolution.



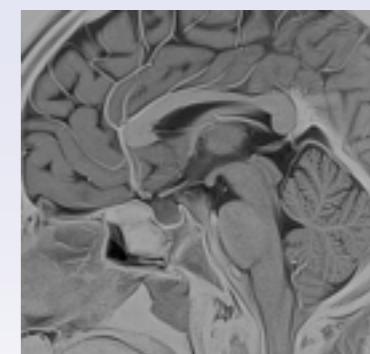
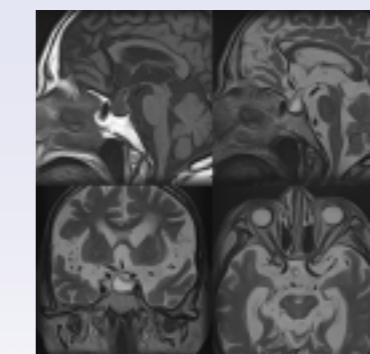
Routine study of the head with the QD Head SPEEDER
Pixel size: 0.5 mm × 0.5 mm
scan time: 3:23
T2-weighted image (black/white reversed)

Pelvic image acquired with the QD Torso SPEEDER (rectal cancer)
Pixel size: 0.5 mm × 0.5 mm
Top: Fat-suppression T1-weighted image
Bottom: T2-weighted image

3-mm Slices

Thin slices permit complex structures to be clearly visualized.

Further evidence of outstanding image quality is the ability to obtain thin slices at 3 mm. For example, extremely clear images of the pituitary gland can be obtained in a short time. The following example illustrates how the high potential and wide range of features of the F²-Edition can be used to improve thin-slice imaging capabilities.



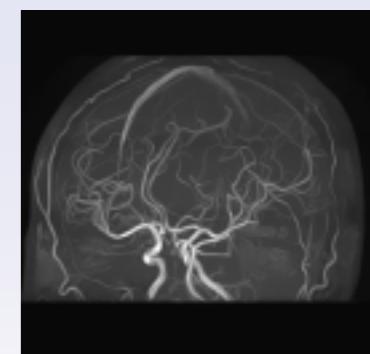
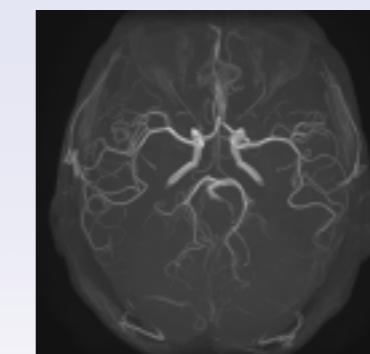
Routine study of the pituitary gland with the QD Head SPEEDER
All four of these images were acquired at a slice thickness of 3 mm.
Scan time: 2:54 for T1-weighted images
2:20 for T2-weighted images

Routine study of the pituitary gland with the QD Head SPEEDER
High-resolution T2-weighted images (black/white reversed)
Slice thickness: 3 mm
resolution: 0.6 mm × 0.7 mm

Whole-Head MRA

Routine 3D-TOF MRA (SORS-STC) makes it possible to clearly visualize the branches of the external carotid arteries.

Direct acquisition of whole-brain MRA images also demonstrates high image quality. The external carotid arteries, which are buried in signals from the scalp and cannot be examined using conventional systems, are clearly depicted. The following example illustrates how the high potential and wide range of features of the F²-Edition can be used to improve vascular imaging capabilities.



Whole-head MRA with the QD Head SPEEDER
Direct Whole MIP image generated by MIP processing of the original image. Images are not adversely affected by fat signals, even without cutting.

Whole-head MRA with the QD Head SPEEDER
Direct Whole MIP image in the sagittal plane. Both the internal and external carotid arteries are clearly visualized.

Fast

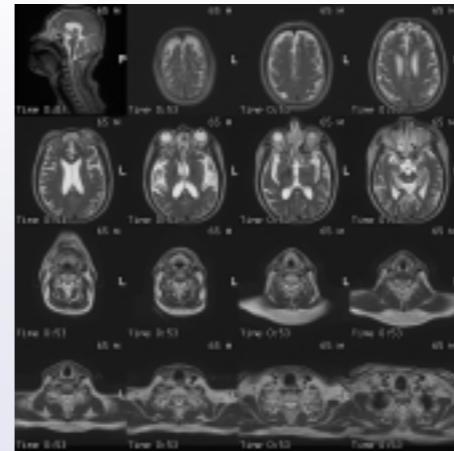
Fast imaging supports a wide range of clinical applications and opens up a new world of diagnosis.



Fine and fast routine studies

Outstanding image quality is easily achieved in high-speed routine studies.

The outstanding capabilities and the wide range of applications of the F²-Edition permit routine studies to be performed with the optimal balance between speed and image quality



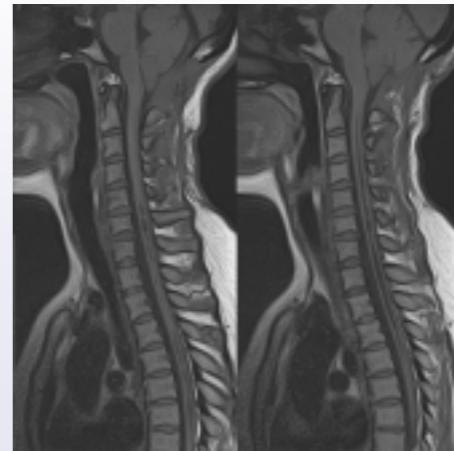
High-speed routine study of the head and neck with the QD Head/NV SPEEDER

A sagittal T2-weighted image is acquired in 1 s, and an axial T2-weighted image is acquired in 53 s. A wide range is covered in a single acquisition.

Ultrafast protocols for head studies (for emergency examinations etc.)

* The actual scan time depends on the imaging conditions, the specific model, the installed options, the patient's condition, and other factors.

MRA 3D-TOF	T1-weighted imaging Field Echo	T2-weighted imaging Fast Advanced Spin Echo	FLAIR Fast Spin Echo	Isotropic Diffusion Single-shot EPI
1:29	0:25	0:07	1:38	0:39



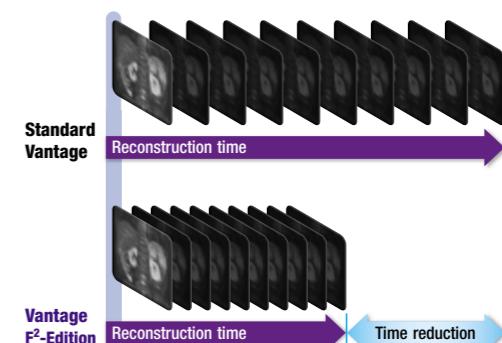
Fast high-resolution routine studies with the QD C/T/L Spine array coil

Extremely sharp images with a 3-mm slice thickness are acquired in as little as 1 minute and 19 seconds.

Fast reconstruction algorithm

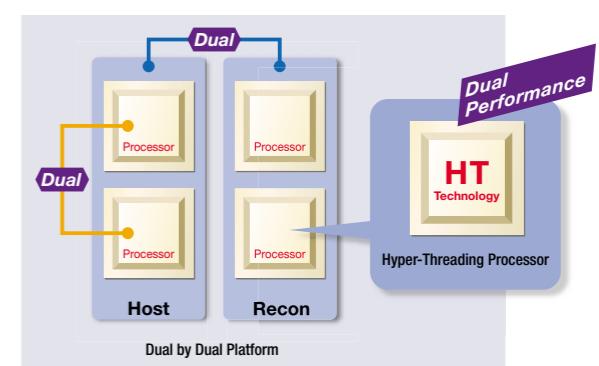
The new fast reconstruction algorithm fully exploits the performance capabilities of the dual Xeon processors, allowing images to be reconstructed twice as fast as with the standard Vantage system.* The large volumes of data used in reconstruction processing with the Fine Algorithm are handled with ease.

* Based on the same conditions.



Fast Multi-Dual processor

The Multi-Engine, which operates as a multiprocessor based on the most advanced computer architecture, is responsible for the outstanding speed of the Vantage system.



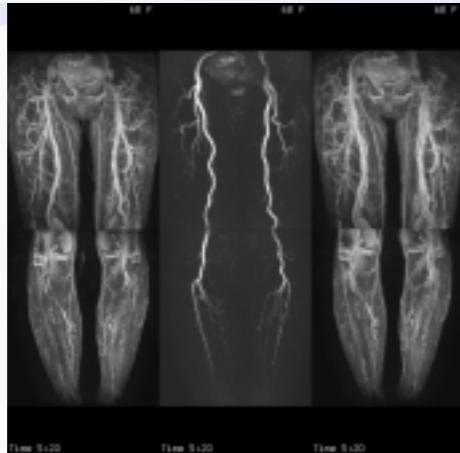
Fine & Fast Application

Some structures can be visualized only with Fine image quality.
Some applications can be run only with Fast performance.

CIA

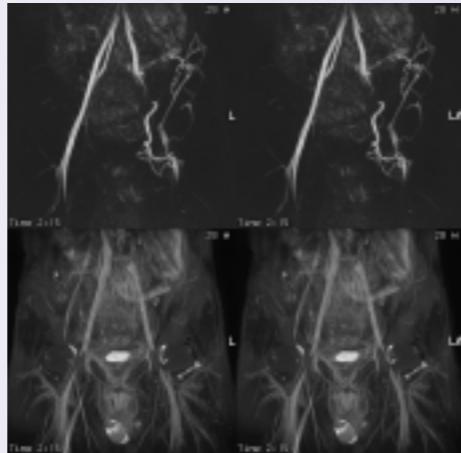
Non-contrast-enhanced artery/vein separation MRA

Fresh Blood Imaging (FBI), which has attracted widespread recognition, has been improved even further. Contrast Improved Angiography (CIA) can clearly separate arteries and veins in the distal extremities without the use of contrast medium.



Non-contrast-enhanced artery/vein separation MRA with the QD Torso SPEEDER

Left: veins
Center: arteries
Right: arteries and veins



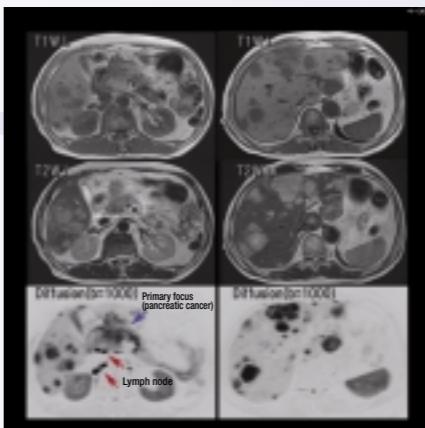
Non-contrast-enhanced artery/vein separation MRA with the QD Torso SPEEDER

Top: arteries
Bottom: veins

Body Vision

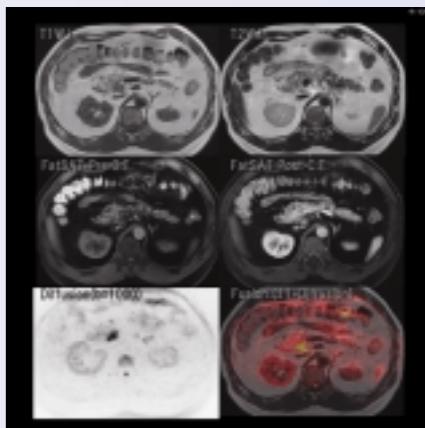
Body Vision imaging with a high b-value

The outstanding magnetic field homogeneity of the Vantage, coupled with the advanced Body Vision sequences, minimize image distortion and ensure clear Diffusion images of the trunk.



Liver metastasis of pancreatic cancer detected with the QD Torso SPEEDER

The Diffusion images (bottom) clearly show the lesions.



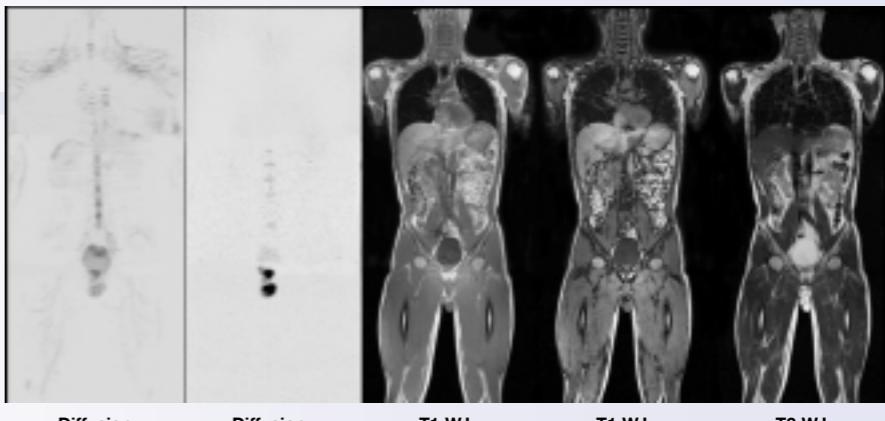
Cancer of the lower biliary tract detected with the QD Torso SPEEDER

The Diffusion images (bottom) show the lesions most clearly.

Wide-Area Imaging

Wide-area imaging with high image quality

Toshiba's unique MSGC and outstanding magnet homogeneity are the key to the excellent image quality for the wide area imaging.



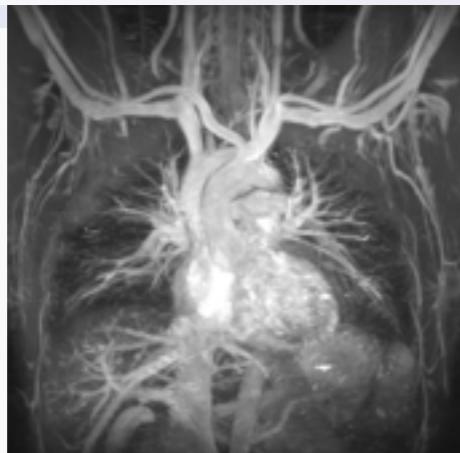
The high-sensitivity whole-body coil provides outstanding images.

Time-SLIP*

Non-contrast-enhanced arterial spin labeling technique MRA

Time-SLIP is a leading-edge application in which the blood itself is excited and selected vessels are clearly depicted without the use of contrast medium.

* Time-Spatial Labeling Inversion Pulse

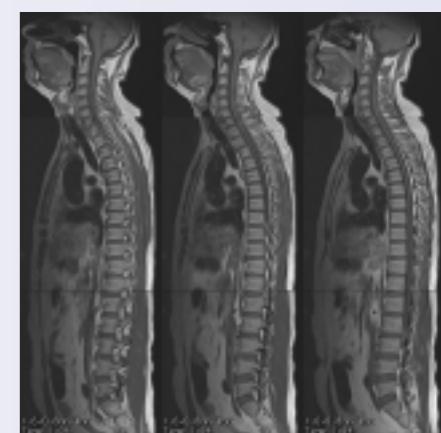
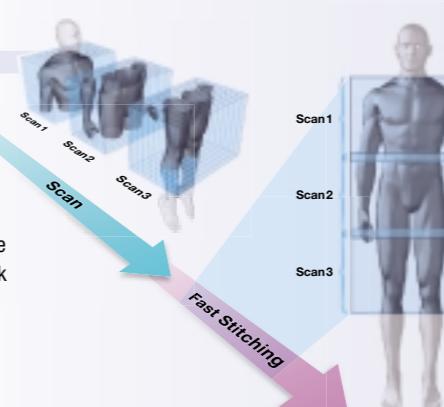


The target vessel is clearly depicted without contrast medium.

Stitching

High-precision image connection

The Stitching function allows images to be connected together quickly and easily for wide-area imaging. The final stitched image can be transported through a PACS network as a DICOM image format.



Whole-spine imaging with Stitching

The entire spine can be depicted in a single image by combining couchtop movement and the Stitching function.

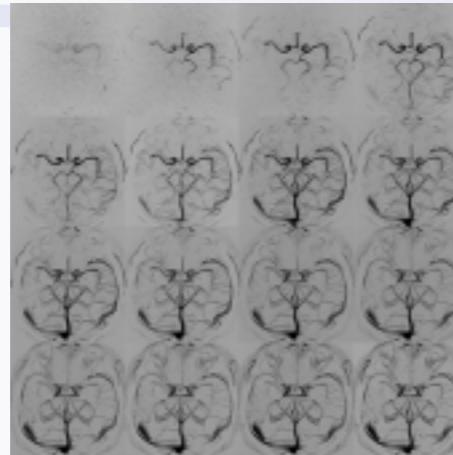
Fine & Fast Application

The Vantage F²-Edition is the best solution in a wide range of clinical applications ranging from routine studies to detailed evaluation.

Freeze Frame Imaging

High-temporal-resolution dynamic MRA (4D-MRDSA)

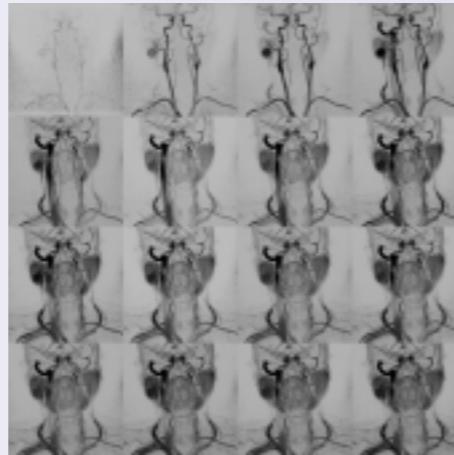
The temporal resolution in contrast-enhanced MRA has been improved dramatically. Serially acquired images can be used to identify the ideal phase for diagnosis and the optimal timing of when to start contrast medium injection.



DRKS* with the QD Head SPEEDER

The speedup factor in DRKS has been increased by a factor of 3. This permits hemodynamics to be visualized with greater precision.

* Different Rate K-space Sampling

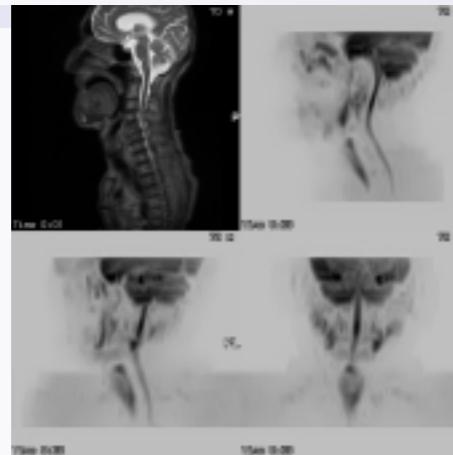


Contrast-enhanced dynamic MRA of the head and neck with the QD Head/NV SPEEDER

Orthopedic Diffusion

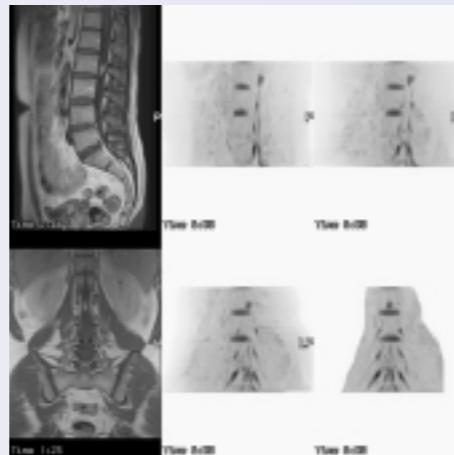
Diffusion imaging in orthopedics

The excellent magnetic field homogeneity achieved in the Vantage F²-Edition is also useful in Diffusion imaging. For example, high-quality Diffusion images of the cervical spine or the lumbar spine can be obtained, a technique that is difficult with conventional systems.



Diffusion images of the cervical spine acquired with the QD head SPEEDER

The nerve roots of the cervical spine are clearly visualized in Diffusion MIP images.



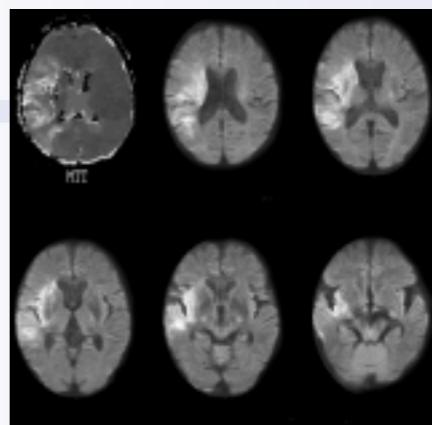
Diffusion images of the lumbar spine

The nerve roots of the lumbar spine are clearly visualized in Diffusion MIP images.

Acute Stroke Set

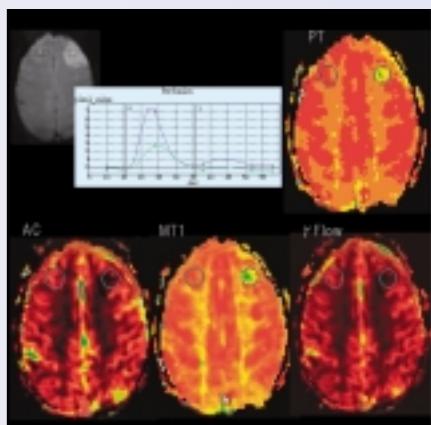
Acute cerebral stroke protocol

An acute stroke protocol consisting of Diffusion imaging, Perfusion imaging, and Perfusion mapping is registered in the main console. This ensures that examinations can be performed without delay.



Acute stroke

Top left: Perfusion image (MTT)
Other: Diffusion images



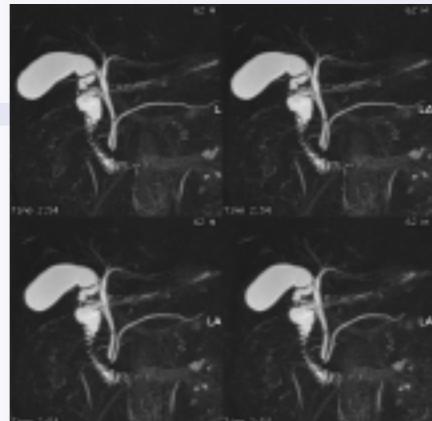
Perfusion color mapping

Perfusion mapping can be performed quickly at the main console.

3D-MRCP

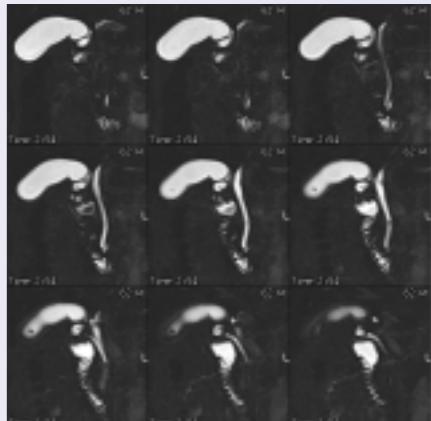
MRCP with high image quality and high contrast

The high-performance QD Torso SPEEDER further improves routine MRCP studies. Clear images can be obtained without the need for patients to hold their breath.



High-quality MRCP images acquired with the QD Torso SPEEDER (MIP processed)

Patients do not need to hold their breath and can relax during the examination.



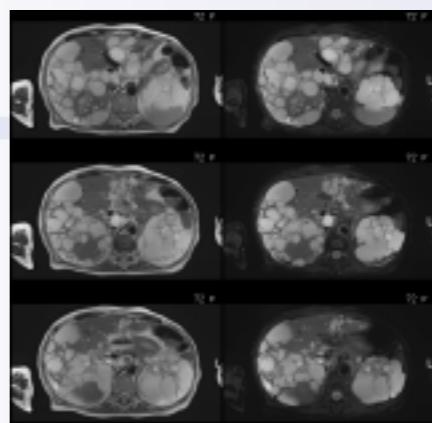
Original images for 3D-MRCP

High-precision original images ensure more accurate diagnosis.

Fat Free Imaging

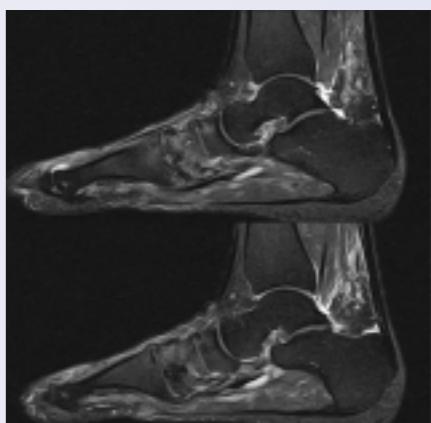
High-precision fat suppression

Excellent magnetic field homogeneity allows clear fat-suppressed images to be obtained not only over a wide area such as chest and abdomen, but also in off-center areas such as the joints of the extremities.



Fat-suppressed images acquired with the QD Torso SPEEDER

The patient rested comfortably with their arms at the sides. Even the fat in the arms is suppressed effectively.



High-resolution fat suppression

Clear fat-suppression images can be acquired at a 3-mm slice thickness.

Patient-Focused Technology

All of the technological advances of the Vantage F²-Edition are for the benefit of the patient. This leading-edge MRI system ensures stress-free examinations.



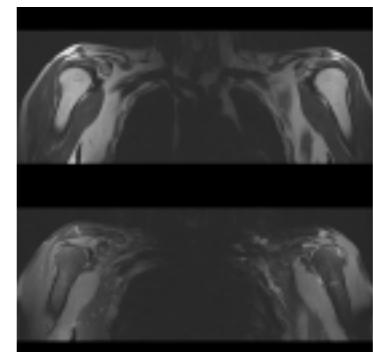
Patient-friendly Short gantry

The ultra-short magnet gantry provides a more comfortable examination environment than ever before.

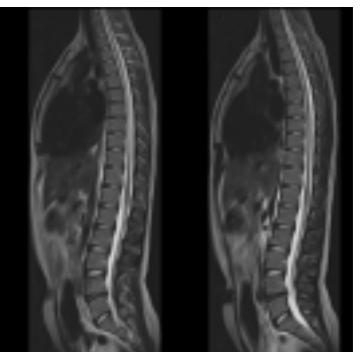


Combination of a Short gantry and a Large clinical FOV

A short magnet is not an advantage if the field of view must be sacrificed. In the Vantage, both a short magnet and a large clinical FOV have been achieved.



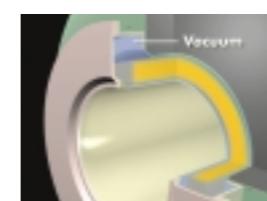
Top: Proton-density-weighted image
Bottom: Fat-suppression image
High-precision images with minimal distortion can be acquired over a wide area.



T2-weighted images
A large FOV can also be set in the body-axis direction.

Patient-friendly Quiet scan technology

Air-Slim Pianissimo (Pianissimo technology designed specifically for a short magnet) reduces scanning gradient noise while providing a feeling of openness for the patient. This ensures a comfortable examination environment for all patients from infants to the elderly.



Pianissimo™

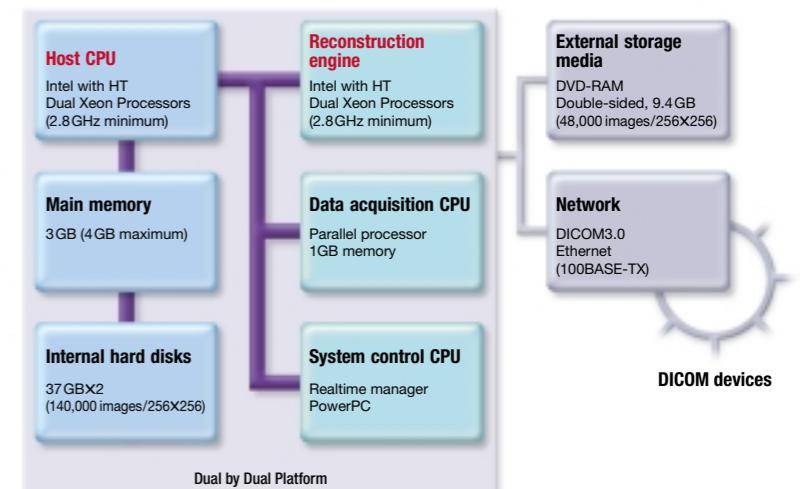
User-Oriented Technology

User friendliness is the direct result of Vantage's state-of-the-art technologies. Leading-edge functions are implemented in a user-friendly manner to maximize study efficiency.



Full multitasking

The computer system employed in the Vantage can handle the most complex calculations and the most urgent processing with full multitasking capabilities.



Quick and reliable network transfer

Troublesome network setup is eliminated. The Auto Archiving function, which is set up specifically for each facility during installation, ensures smooth network transfer.

Intuitive Interface

The advanced user interface allows users with little experience in MRI to perform examinations with ease.



Fine & Fast Technology

All of the new technologies in the Vantage F²-Edition result in higher image quality and faster processing.



SPEEDER

Toshiba's original parallel imaging technologies for high image quality

Toshiba's original parallel imaging technology, SPEEDER is highly flexible and user friendly while maintaining high image quality. The SPEEDER coils of the Vantage provide the ultimate in image quality and examination efficiency. Parallel imaging with no sacrifice in image quality is Toshiba's goal.



QD Head SPEEDER

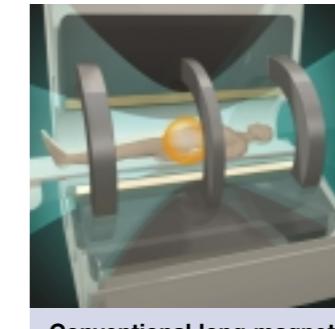


QD Torso SPEEDER

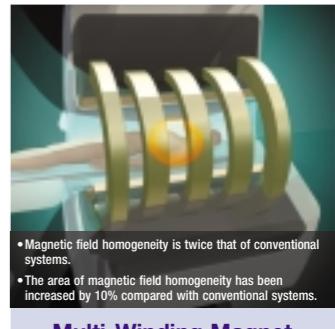
Multi-Winding Magnet

Leading-edge short-magnet technology provides high magnetic field homogeneity.

The magnet is shorter, but the area of magnetic field homogeneity is longer than in conventional systems. Vantage satisfies both of these conflicting requirements, combining a short magnet with exceptional magnetic field homogeneity.



Conventional long magnet

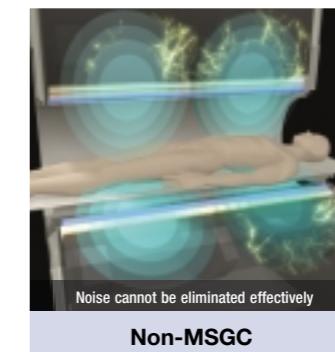


Multi-Winding Magnet

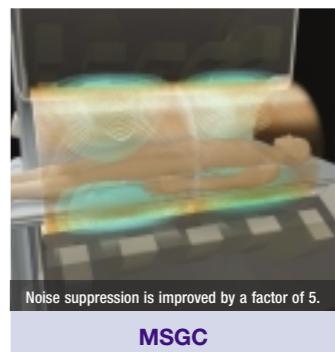
MSGC

Advances in gradient field technology significantly reduces eddy current noise.

Electromagnetic noise due to eddy currents degrades image quality. Vantage eliminates eddy current effects and provides extremely clear images.



Noise cannot be eliminated effectively
Non-MSGC



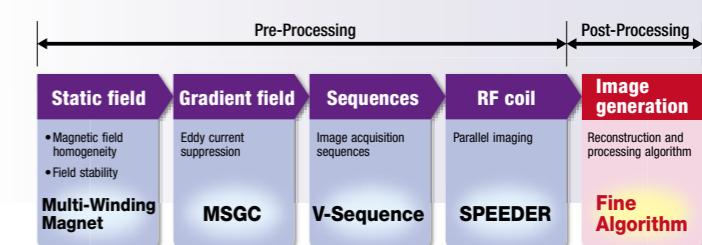
Noise suppression is improved by a factor of 5
MSGC

Fine Algorithm

New image generation algorithm for higher image quality

The most advanced digital image generation technology, the Fine Algorithm, is applied in post-processing when images are reconstructed and processed. The Fine Algorithm further improves the quality of images generated from the high-quality raw data acquired using high-performance hardware.

Processes that determine image quality



Head-to-Toe Clinical Utility

Vantage features a variety of RF coils optimized to provide superior image quality across a wide range of applications.

QD HEAD SPEEDER



A 4-channel/8-channel, 10-element QD array design delivers up to 50% higher SNR when compared with conventional QD head coils.

QD HEAD/NV SPEEDER



A 4-channel/8-channel, 12-element QD array design expands coverage from the aortic arch to the top of the head.

QD C/T/L SPINE ARRAY COIL



A QD array design that consists of 12-elements and provides 75 cm of coverage.

BREAST COIL



This coil can be used in both array and linear configurations. It offers easy patient positioning and uniform imaging of both breasts.

QD NEUROVASCULAR ARRAY COIL



A 4-channel, 7-element QD array design provides images with excellent SNR over a wide field of view.

QD HEAD COIL



This QD coil is designed to produce high quality images of the head with a large inner diameter of 27cm. A detachable mirror and dedicated positioning pads increase patient comfort.

SHOULDER ARRAY COIL



A 4-channel array configuration provides excellent spatial and contrast resolution.

GP FLEX COIL



This wrap-around flexible RF coil for the extremities and joints is designed to optimize SNR.

QD TORSO SPEEDER



A 4-channel/8-channel, 16-element QD array design delivers up to 60% higher SNR compared with conventional QD whole-body coils. It is suitable for abdominal or cardiac studies.

FLEX BODY ARRAY COIL



A 4-channel array design provides high-SNR images. It completely wraps around the region of interest with a maximum circumference of 1,320 mm.

QD KNEE/FOOT COIL



This QD coil is designed to obtain high SNR images of the knee, ankle and foot. An extended coil element allows the foot to be kept in a comfortable position during scanning.

QD KNEE COIL



This design optimizes the SNR and provides a uniform RF field. The large 195-mm inner diameter and hinged upper section facilitates patient positioning.