

TOSHIBA

Leading Innovation >>>

LEADING INNOVATION

For more than 130 years, Toshiba has been a world leader in developing technology to improve the quality of life. Some 50,000 global patents demonstrate that rich history of leading innovation. It might surprise you to learn some of the things we've invented.

1875 Founding of Toshiba	1998 First generation of non-contrast MRA	2006 First 128 element MRI system
1915 First X-ray tube	2000 First all-digital multipurpose x-ray	2006 4th generation of non-contrast MRA
1989 First helical CT scanner	2001 2nd generation of non-contrast MRA	2007 First dynamic volume CT scanner
1993 First one-million-pixel CCD	2003 First 64-slice CT scanner	2007 First 71 cm aperture in an open MRI
1997 First open, superconducting magnet	2003 Ultra-short 1.5T MRI system	2009 5th generation non-contrast breast imaging
1998 Quietest 1.5T MRI System	2005 3rd generation of non-contrast MRA	2011 Quietest open bore 3T

1.5T Premium Open Bore MRI System

Vantage Titan



TOSHIBA MEDICAL SYSTEMS CORPORATION

<http://www.toshibamedicalsystems.com>

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Vantage Titan



Vantage Titan™ provides your best solution.

The 71 cm aperture provides the best access for examinations on any size patient. The unique combination of this open-bore and our industry leading homogeneity enables you to acquire outstanding image quality without compromise.

Daily workflow and productivity will be optimized by Toshiba's intuitive user interface "M-Power". The advanced functions of M-Power take MR performance and flexibility to higher levels than ever before.

Opening the door to new possibilities

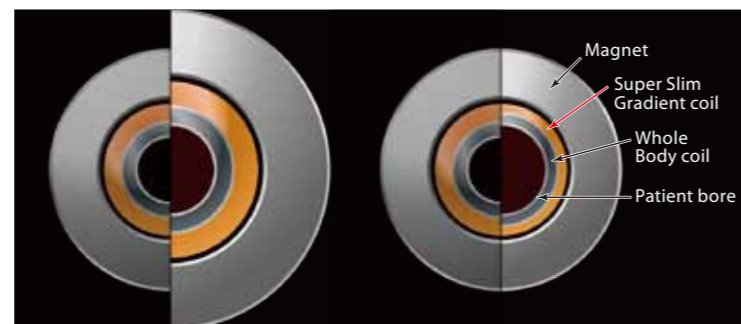


Unique combination of open bore and high-quality image

One of the challenges for MRI systems with open bore is maintaining the homogeneity of the magnetic field. The larger the diameter of the super-conducting magnet, the more difficult this becomes. Toshiba's advanced technologies enables the combination of 71 cm open bore and high-quality images by keeping the homogeneity specification the same as our previous systems.

Super Slim Gradient

Toshiba's Super Slim Gradient coil is an actively shielded gradient coil, which provides more room for examinations while enhancing performance. Toshiba's Super Slim Gradient coil makes an open bore system with high-magnetic field homogeneity.



■ Conventional system

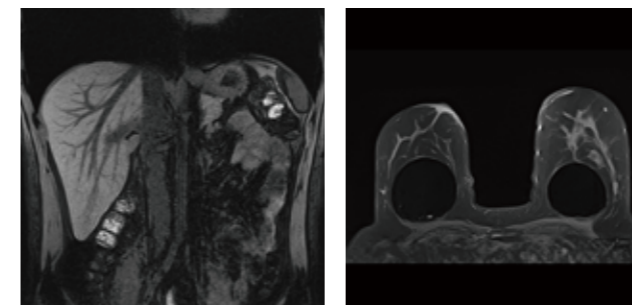
Large magnet diameter deteriorates the homogeneity of the magnetic field.

■ Vantage Titan

Super Slim Gradient coil enables to provide open bore system without enlarging magnet diameter.

Fat Free Imaging

Magnetic field homogeneity is the most important factor for any fat suppression technique. High quality magnet and the advanced Super Slim Gradient coil of Toshiba's Titan makes for superior fat suppression over a wide range of clinical applications.

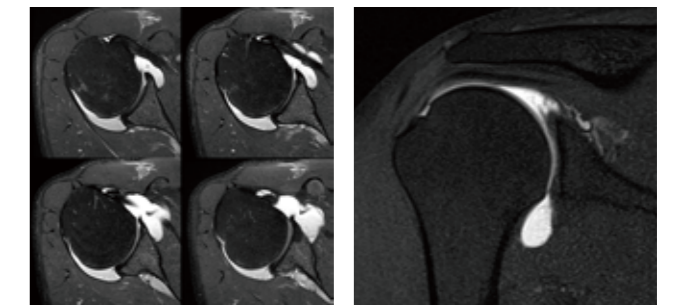


■ Effective fat suppression for wide-area coverage

Superior fat suppression can be accomplished even on large areas such as the abdomen and chest, including the breast.

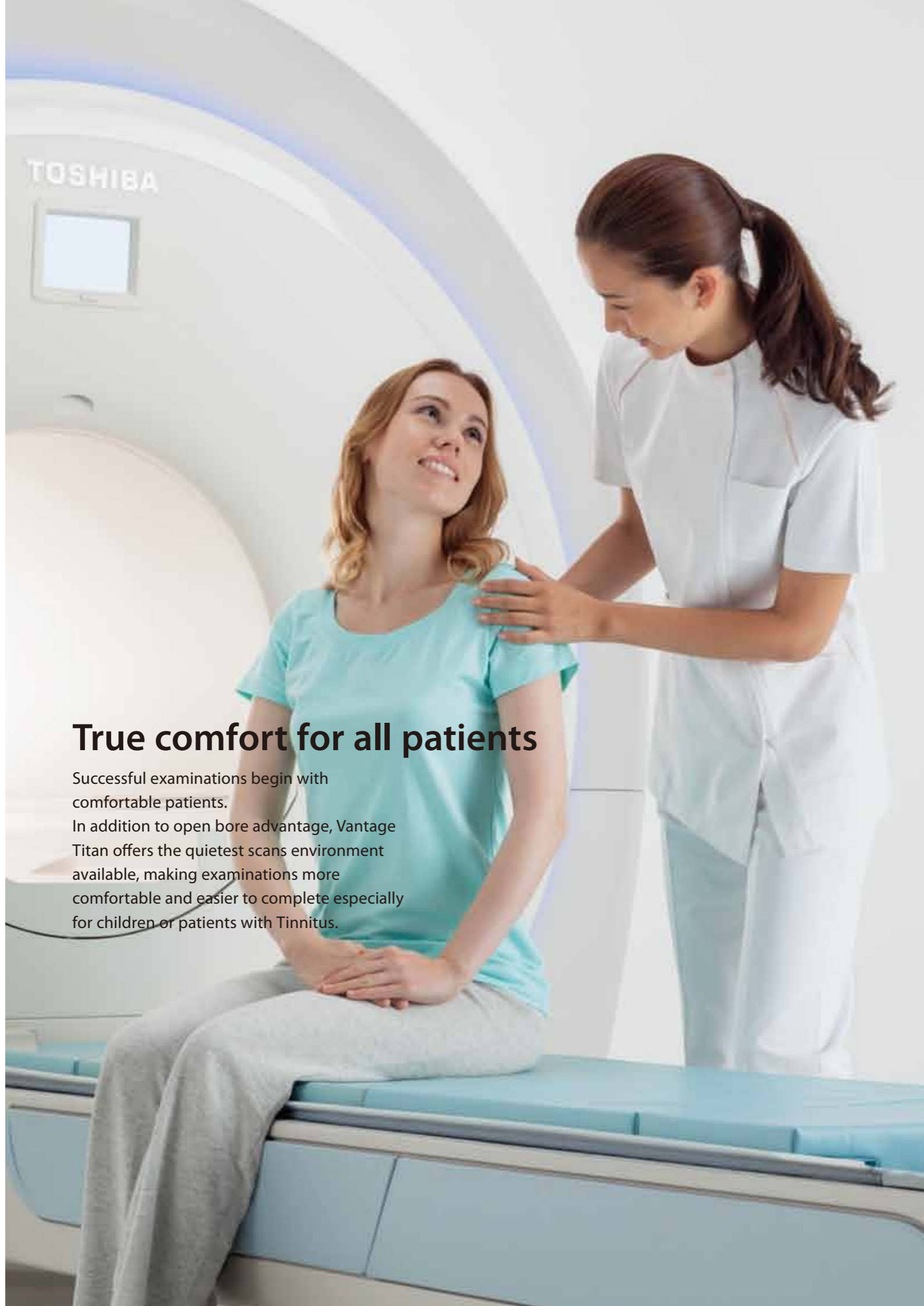
Off-center Imaging

Magnetic field homogeneity is also the important factor for successful off-center imaging. Vantage Titan provides high quality images even for the most off-center images like shoulders or the breast.



■ Shoulder image at off-center region

High quality image can be acquired even at off-center region.

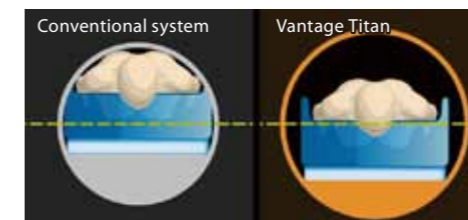


True comfort for all patients

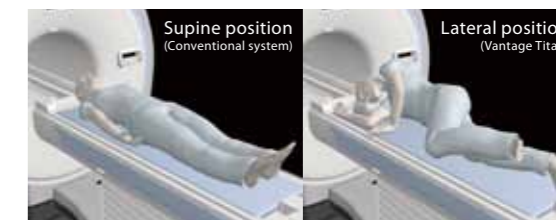
Successful examinations begin with comfortable patients. In addition to open bore advantage, Vantage Titan offers the quietest scans environment available, making examinations more comfortable and easier to complete especially for children or patients with Tinnitus.

71 cm Open Bore

The 71 cm aperture gives you more room and flexibility, providing patient with a feeling of openness. It allows you to have an examination in lateral position, which is difficult with conventional system. This comfortable room allows you to adjust a wide range of clinical situations and move the patient within the bore when necessary.



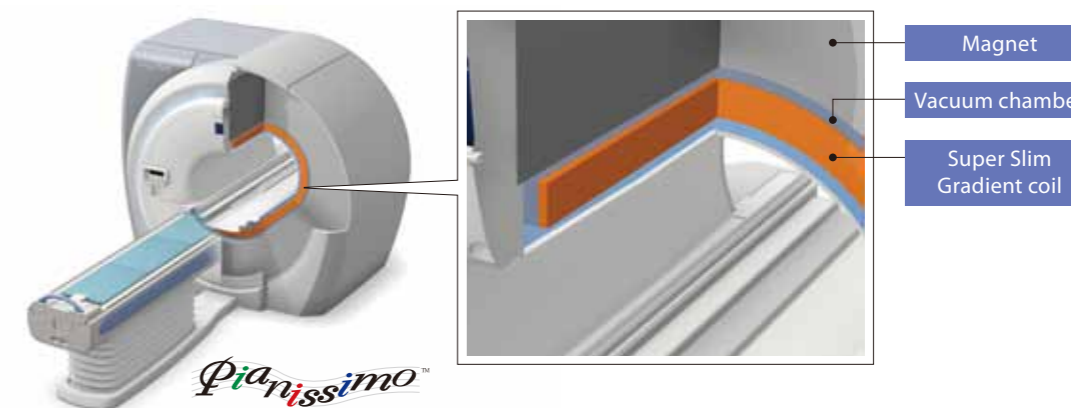
Comfortable room for breast examination
Breast examination is available without compromise due to the expanded off-center imaging field of view within the large bore.



Lateral position examination
Examination in the lateral position, similar to endoscopic operation, is easily available. Patients can be scanned in the most relaxed position for their condition.

Pianissimo™

Pianissimo technology significantly reduces the noise in and around the MRI environment. The Super Slim Gradient coil is encased in a vacuum chamber, suppressing propagation of acoustic noise. Pianissimo provides the quietest examination environment in the industry.



Comfort Design

System details are designed for patients' comfort.



- 1 Gantry ambient lighting**
Special lighting eases the patients' anxiety caused from entering a closed space.
- 2 Gently curved aperture design**
The aperture design reduces patients' anxiety when patients enter the bore.
- 3 Low height tabletop**
Patients can easily get onto the table.
- 4 LED illumination inside the bore**
Adjustable LED eases patients' anxiety during examinations.
- 5 Easily viewable physiological information monitor**
For patients' safety, operator can easily check the patients' physiological information.

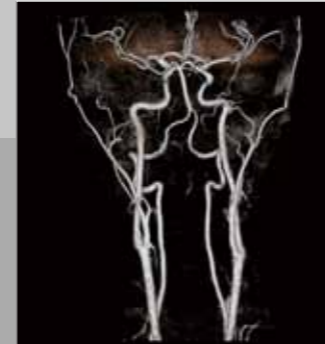
High quality, non-contrast MRA minimizes patient risk

An increasing awareness of the potential risks associated with gadolinium-based contrast agents has revealed the need for an alternative, which led to our invention of new contrast-free MRA techniques. Toshiba's Titan provides advanced non-contrast MRA techniques that minimize risk to patients while producing exceptional images.

Non-contrast MRA

To acquire the high-quality non-contrast MRA images, appropriate techniques should be used for the region and diagnostic purpose of the examination. Vantage Titan provides a complete suite of non-contrast MRA techniques to fully meet the clinical requirement for non-contrast MRA imaging.

*some functions are options.



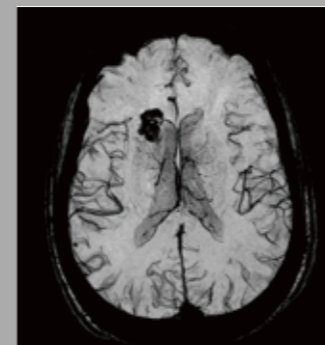
TOF (Time of Flight)
VR image of head and cervical vascular clearly shows details of arteries.



Time-SLIP (Time-Spatial Labeling Inversion Pulse)
VR image of renal artery. More and smaller details of branched arteries can be clearly depicted than with any other technique.



CIA (Contrast-free Improved Angiography)
Vessels of lower limb can be clearly depicted with separating arteries and veins with better depiction of small vessels with delicate blood flow.



FSBB (Flow Sensitive Black Blood)
FSBB shows more details of arteries and veins which cannot be depicted by TOF.



V-Trace
Combination of FSBB and TOF depicts blood vessels with a wide range of flow velocities.

FBI (Fresh Blood Imaging)	Depicting arteries and veins separately by utilizing the difference of flow velocities between diastole and systole.
CIA (Contrast-free Improved Angiography)	By applying pre-pulse to FBI, more details of blood vessels can be depicted.
FBI Navi	Support to set the most appropriate delay time for FBI imaging.
SPEED	Depicting vessels running in various directions such as pulmonary blood vessels.
Time-SLIP (Time-Spatial Labeling Inversion Pulse)	By setting pre-pulse for extraction or suppression, target vessels can be depicted clearly.
FSBB (Flow Sensitive Black Blood)	Showing details of both arteries and veins by utilizing flow dephase effect.
V-Trace	Combining FSBB and TOF to depict blood vessels with a wide range of flow velocities.



Ease of use for every level of users

M-Power is Toshiba's intuitive user interface, which can be easily used by any technologist or physician whether they are new to MR or have years of experience. It allows for the efficient use of Vantage Titan for optimized workflow and productivity.

Intuitive User Interface

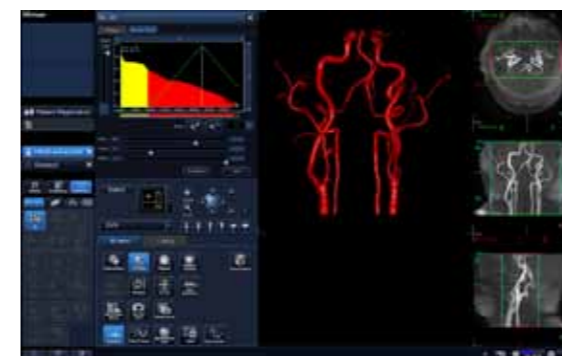
M-Power

The design of M-Power is based on clinical workflow in order to enhance the daily workflow. M-Power makes MRI operations remarkably easy to learn and use, enabling operators of every skill level to access its full range of functionality.



Universal GUI (Graphic User Interface)

Look and feel of GUI are common between Toshiba's other modalities. It enables operators to use whole Toshiba's modalities in the similar way. It is designed to enhance the daily workflow, which maximizing system productivities.



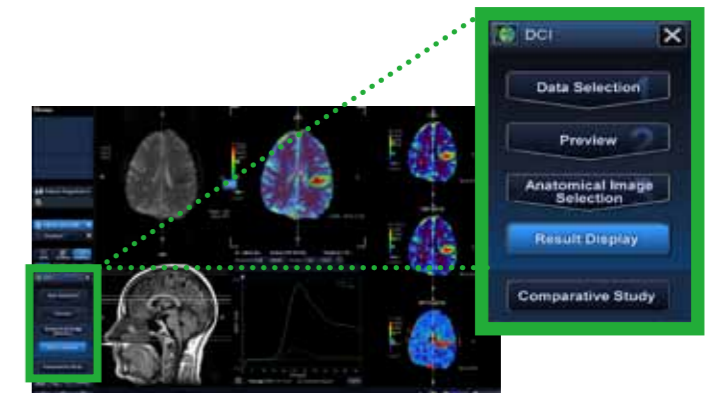
■ M-Power operation window

Easy to use due to intuitive icons and operation window. For operators, we specifically chose colors which reduce eye fatigue.

WFDA

Work Flow Driven Application

WFDA appropriately guides you based on clinical workflow including scan parameter setting, post-processing and image transfer. It enables you to use advanced application without difficulty.



■ Navigation for DCI examination

The whole process is displayed on the monitor, which tells operators what should they do next. It is simple to go back when needed to make changes.



Ensuring high quality examinations

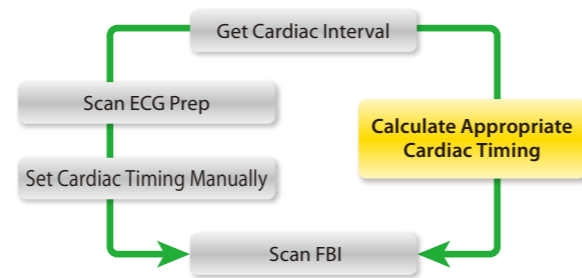
It is important to ensure the highest possible examination quality no matter who operates the MRI system. Vantage Titan provides advanced operation support functions, enabling every level of users to acquire the same standard results. It makes daily examinations consistent and efficient.

Ensuring high-quality non-contrast MRA examination

It no longer requires a high level of experience for lower limb FBI. Vantage Titan enables anyone to acquire high quality images of lower limb FBI consistently even with an inexperienced operator.

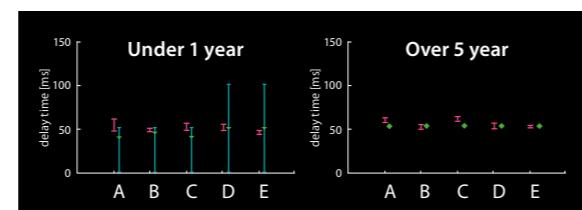
New workflow for FBI examination

Vantage Titan allows to scan without ECG Prep, which is required for the accurate determination of systole and diastole.



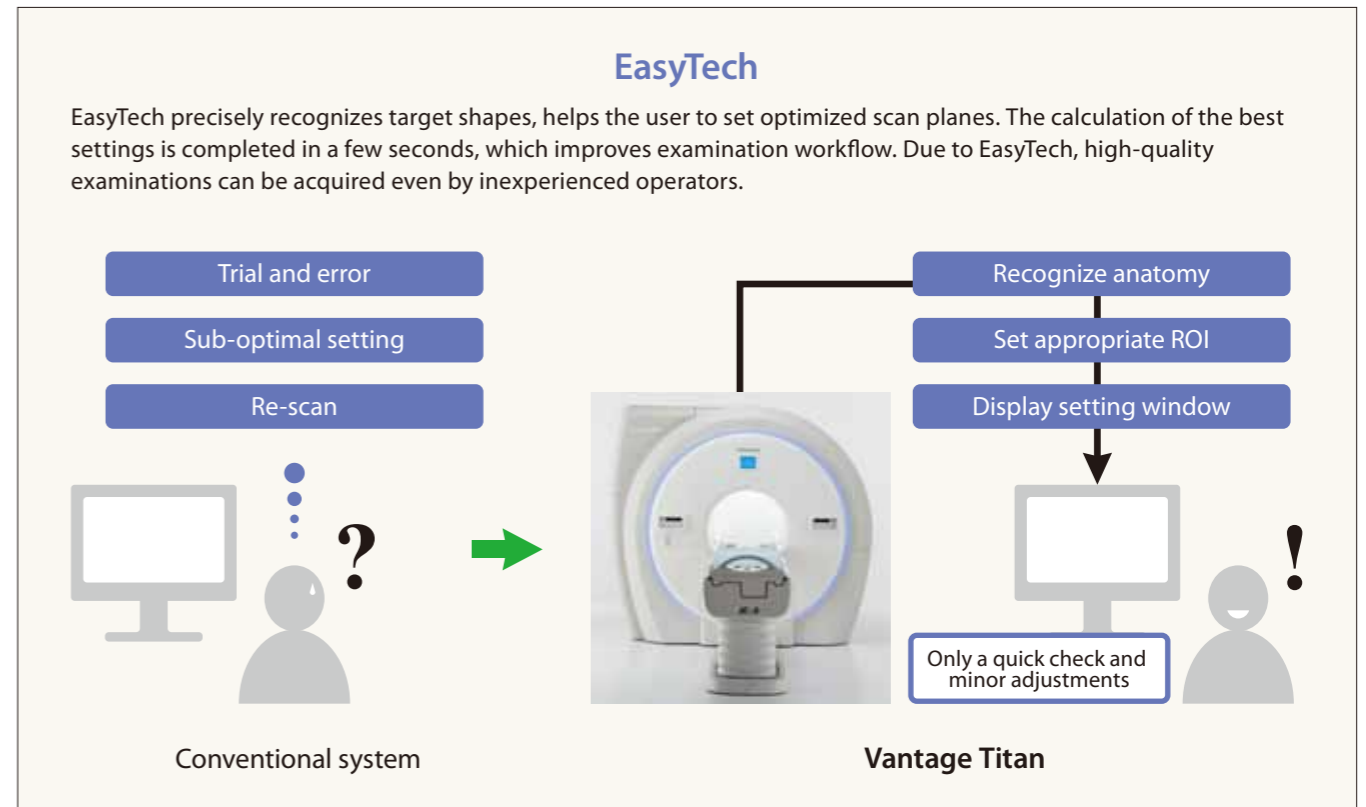
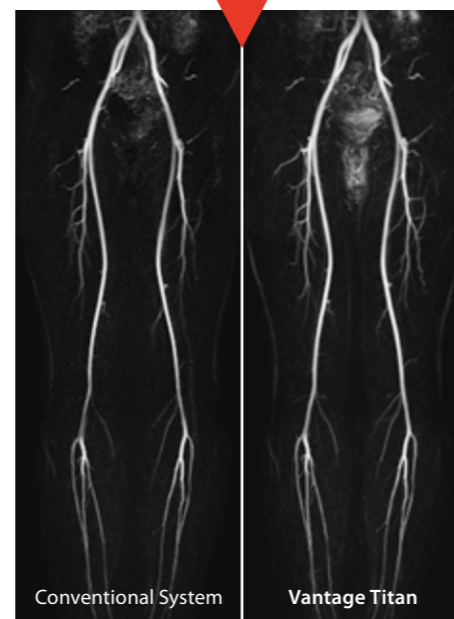
Steady examinations are available regardless of operator's experience

FBI examinations used to depend on the operator's judgement to set appropriate delay time of systole and diastole. Thanks to Vantage Titan's advanced operation support function, operators who have any level of experience can have same standard of result as any other user. (Red plot: Delay time set by Vantage Titan, Green plot: Delay time set by conventional system)



Ensuring the quality of lower limb FBI examination

Vantage Titan provides superior image quality than any previous method.



NeuroLine

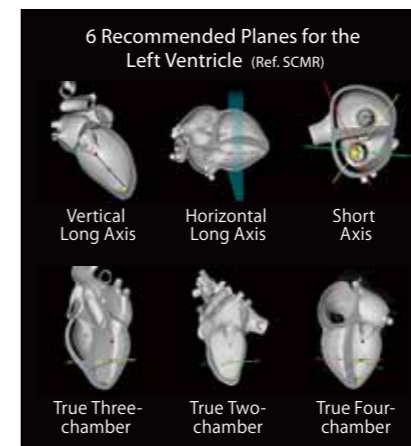
ROI setting window of each slice is displayed after automatically calculating the shape of head. NeuroLine enhances the reproducibility and efficiency of head examinations.



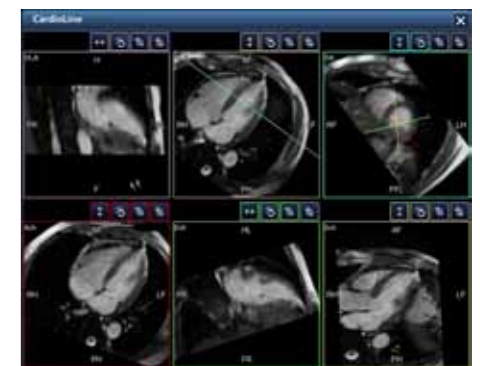
ROI setting window of NeuroLine

CardioLine

Scan planes are set in only a few seconds after acquiring 2D multi-slice images of whole heart. With CardioLine, precise cardiac examinations become available in a short time, reducing the patients' and the technologist tension and stress.



Scan planes for cardiac examination. The scan planes are recommended by SCMR.



ROI setting window of CardioLine. CardioLine supports cardiac plane settings based on planes recommended by SCMR. Scan planes are displayed automatically according to the ROI setting, enhancing the reproducibility and efficiency of cardiac examinations.

*Operation support functions are options.

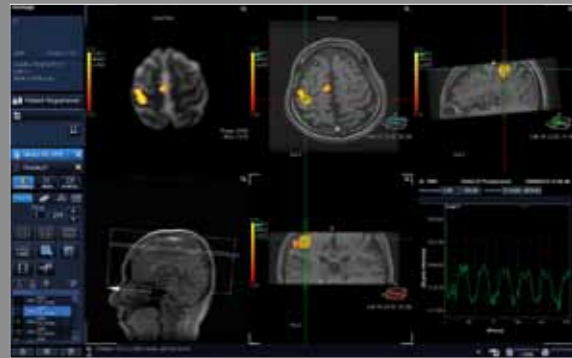


mNeuro

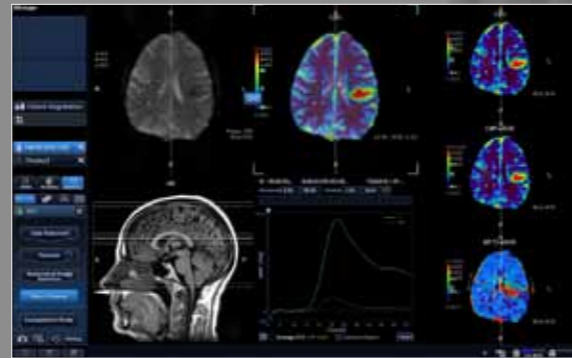


mVox

3D image data of whole head can be acquired in 1 scan. 3D post-processing in any planes makes diagnosis much more flexible while quicker and easier.



BOLD Magnig



Dynamic Contrast Imaging

On Console Processing

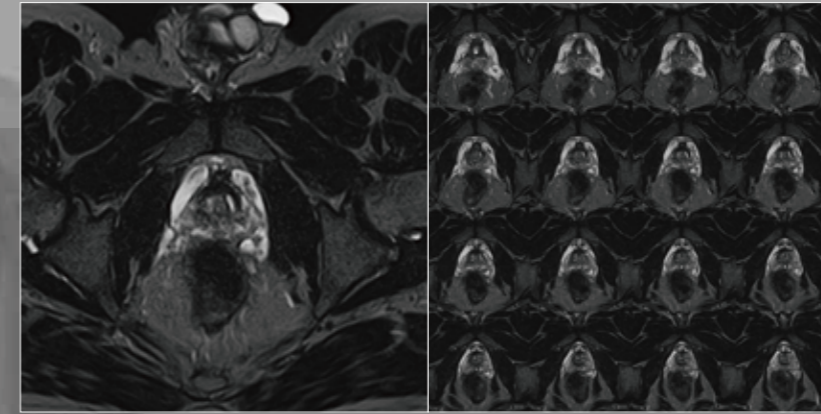
On Console Processing

The entire diagnostic process including post-processing, analysis and display can be done on console. It reduces the operator's stress and enhances the daily workflow.

mSoftware provides a wide range of clinical application

mSoftware is suite of advanced solutions for each clinical region based on M-Power user interface. Optimized sequences and functions are packaged in each of the different mSoftware applications, providing the best solution for each clinical region.

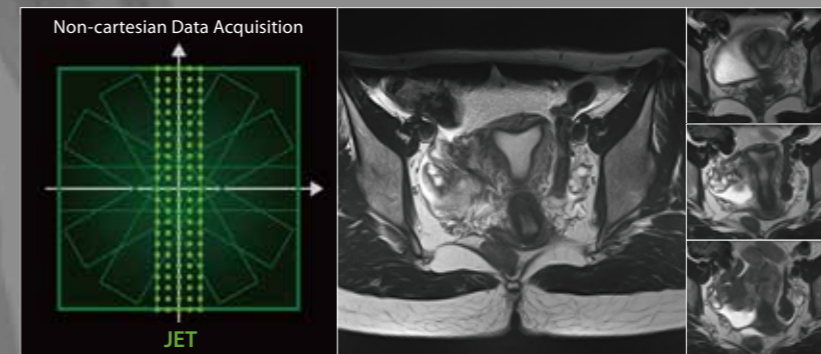
mBody



mVox

3D image data of whole organs can be acquired in 1 scan. 3D post-processing in any plane makes diagnosis much easier.

← Images of the prostate acquired by mVox.



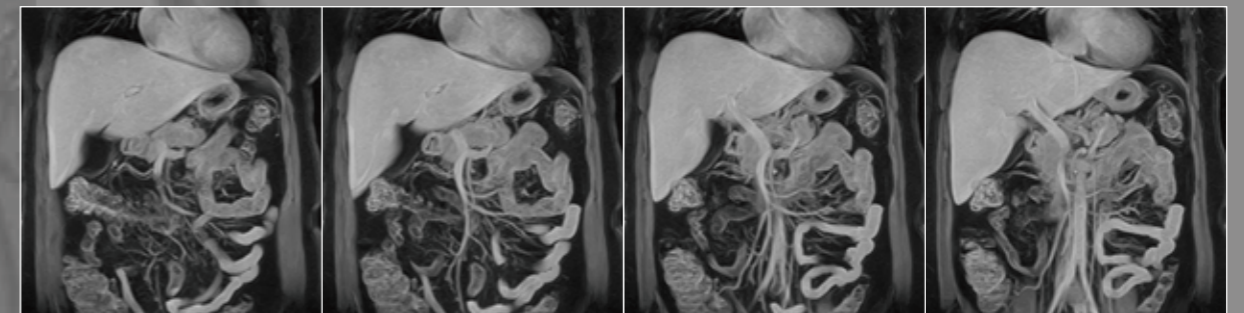
JET™

(Non-cartesian data acquisition)

The JET technique acquires data for the k-space in non-cartesian mode to suppress motion artifacts caused from any involuntary motion. JET is useful not only for body examinations but also for other examinations such as head.

← Images of the uterus by using JET technique.

mVascular



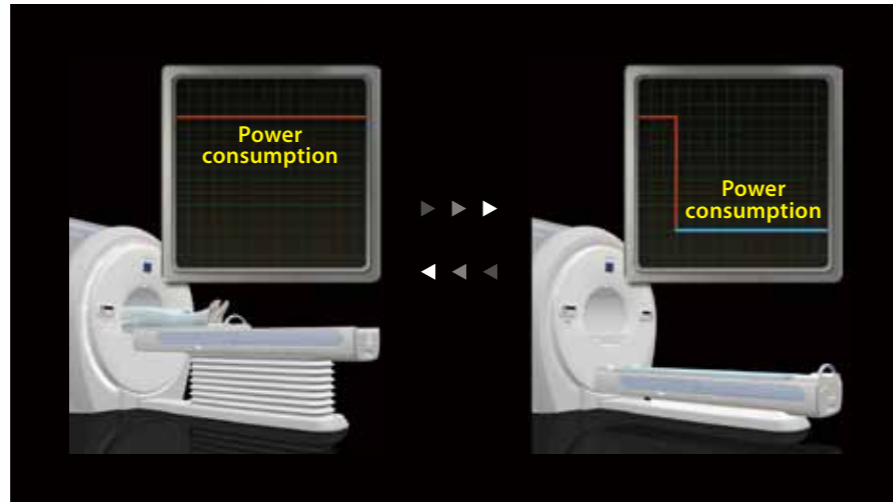
STAMD

Original post-processing technique STAMD enables the spatial relationships between blood vessels to be visualized more clearly. Images are Vascular body images acquired by using STAMD technique.

*mSoftware is option.

ECO Mode

The power consumption is reduced 15,500 kWh per year by utilizing "Eco Mode". Eco Mode turns off a part of system while it is not used, which minimizing the system running cost. Required raged power has been reduced by around 25%, minimizing the total cost of ownership*.



■ During examination

Eco mode suppresses power consumption until the patient setting is completed. After the patient setting, Eco mode is immediately switched to scan mode.

■ After examination

Power consumption is reduced by automatically switching to standby mode. This switching is completed within less than 1 second.

*Comparison with Toshiba conventional system.

Site Planning

It is important to install the system with an optimized site plan in order to maximize the system usability and efficiency as well as patient throughput and comfort. Taking great care of the surrounding environment, Toshiba's service department takes great care to provide the most appropriate site plan to install the system.



Safe and Eco Sensitive

ECO mode minimizes daily power consumption, reducing the system running cost.

Site planning support helps our customers to install the system with the optimum site plan.

With this the Vantage Titan will run in the most effective way.





Enhance workflow and networking with exceptional performance

Vantage Titan is designed to embrace open network standards to facilitate easy integration in the widest variety of network environment.

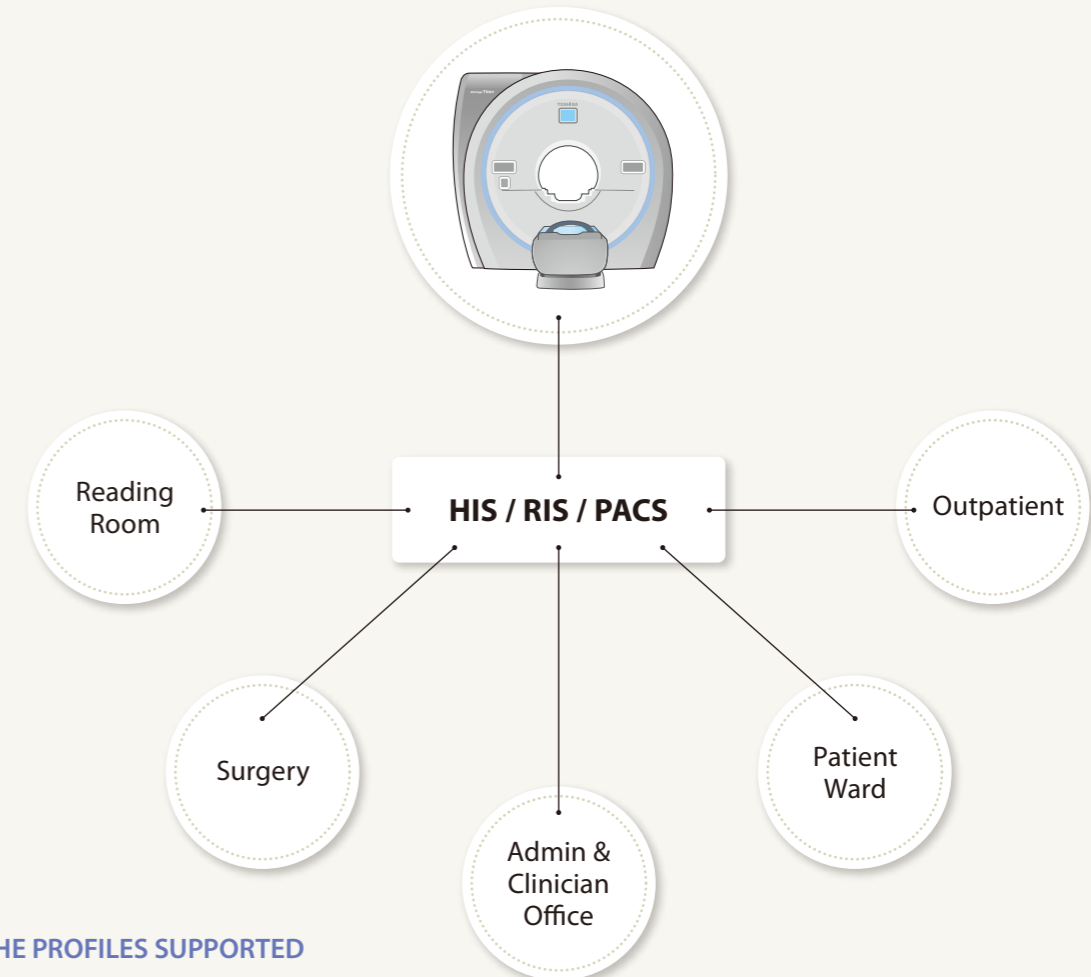
Vantage Titan system comply with DICOM standards to assure optimum communications between network systems.



Magnet	1.5T High Field Homogeneity Magnet
Patient Aperture	71 cm
Active Shield Gradient Coil	Super Slim Gradient ¹⁾
Noise Reduction Technology	Pianissimo ²⁾
Non-contrast MRA technology	Time-SLIP ³⁾ , FBI, FSBB, V-Trace, ASL and more advanced technologies
User Interface	M-Power
Operator support function	EasyTech ⁴⁾ (CardioLine ⁵⁾ , NeuroLine ⁶⁾ , and other advanced technologies
Energy Saving Technology	Eco Mode ⁷⁾

HOSPITAL NETWORK INTEGRATION

Toshiba has voluntarily implemented the communications of its medical imaging systems with Integrating the Healthcare Enterprise (IHE). This allows the user to boost clinical efficiency with universal IHE connectivity for simple access and distribution of data across any size hospital or physician network.



IHE PROFILES SUPPORTED

- Scheduled Workflow
- Portable Data for imaging
- Consistent Presentation of Images
- Consistent Time

- 1) Super Slim Gradient: Advanced Active Shielded Gradient Coil providing both high-quality images and comfortable examination space for patients
- 2) Pianissimo: Noise reduction technology collaborating with Super Slim Gradient
- 3) Time-SLIP: Non-contrast MRA technique enabling to acquire images of hemodynamics for selected vessels
- 4) EasyTech: Functions to support settings of scan planes
- 5) CardioLine: Support to set 6 cardiac planes recommended by SCMR
- 6) NeuroLine: Support to set 3 standard planes for head examination
- 7) Eco Mode: Function to turn a part of the system to reduce the power consumption, which can be switched to scan mode within less than 1 second

*Some functions are options.