



APERTO Lucent

Prime Open MRI



The Prime Open-MRI Technologies for High-field Applications.



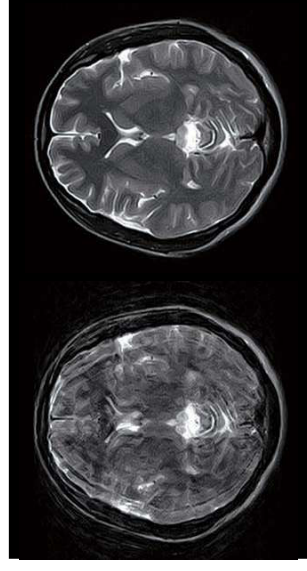
APERTO Lucent Prime Open MRI

Can the system grasp the necessary information in an instant? Can it perform highly reproducible clinical imaging? Can it avoid putting a heavy strain on examinees? And is the environment taken into consideration? All possible performances have been pursued to suit the needs for diagnostic imaging. When all of these performances are combined together at a high-dimensional level, Open MRI becomes the PRIME. APERTO Lucent debuts.

RADAR[※]

In MRI diagnosis, impacts of motion artifacts should be considered. Our new feature, RADAR, mitigates the motion artifacts, which can be used not only with T2WI, but also with T1WI and FLAIR, obtaining any slice direction for your needs.

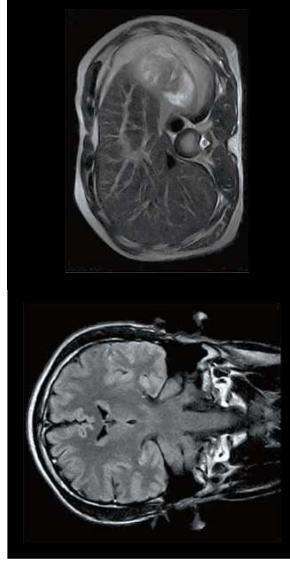
We believe this feature will be widely applied to clinical applications.



Conventional
3:46

Brain T2WI

RADAR
3:50



Brain-COR
RADAR-FLAIR

Abdomen (Free Breath)

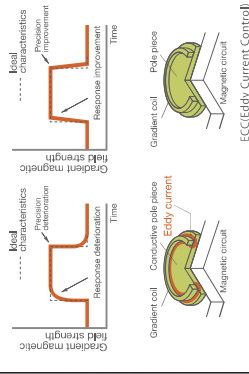


Shoulder-AX
RADAR-PDWI

Shoulder-COR
RADAR-T2WI

ECC system

The eddy current suppression is crucial for stable and high quality images. Hitachi has not only applied the eddy current suppression technology to the magnet itself, but also incorporated an ECC (Eddy Current Control) function which predicts and suppresses the generated eddy current.



ECC (Eddy Current Control)



High performance magnetic circuit

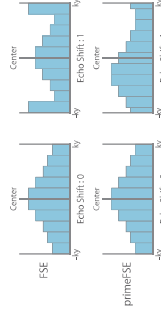
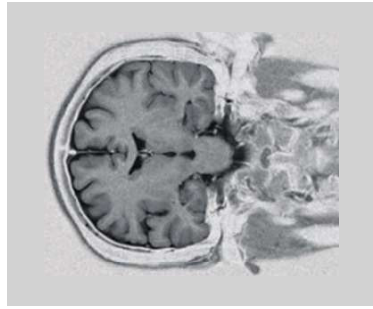
Compact and stylish gantry has realized a strong magnetic power of 0.4T. APERTO Lucent has realized a high image quality by applying various technologies to the structure and materials for the magnetic circuit, realizing high efficiency in the utilization of magnetic power and by suppressing the generation of eddy currents to a minimum.



More beautifully, more minutely, more exactly. APERTO Lucent pursues image quality. By making the most of Hitachi's imaging technologies, APERTO Lucent takes the imaging diagnosis to the next level.

The MRI system that continues to evolve every day. The appearance of new sequences and higher efficiency hardware----- The Open MRI continues to evolve. The new APERTO Lucent can be incorporated with new measurement functions such as primeFSE^{®1} and CE-Perfusion^{®1}, newly developed by Hitachi for higher magnetic field MR systems. In addition, incorporation of the newly designed image reconstruction system realizes 2048 x 2048 image reconstruction^{®2} that corresponds to high definition images.

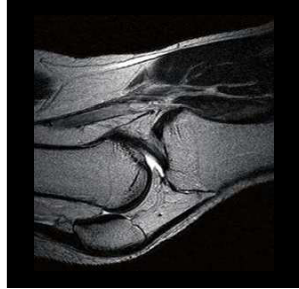
Prime imaging capabilities



In the existing FSE, necessary echoes were arranged in the center of the k-space, but as remaining echoes were not optimized, truncation artifact could readily occur. The primeFSE not only suppresses truncation artifact but also allows free setting of the effective TE.

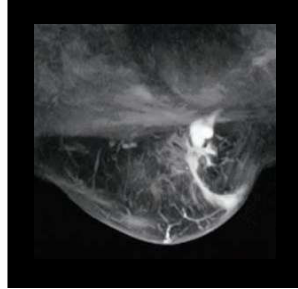
primeFSE^{®1}

The primeFSE has enabled not only the optimized echo arrangement but also the parameter settings with the same sense of that of the SE sequence. This has allowed active use of the features that the FSE sequence possesses.



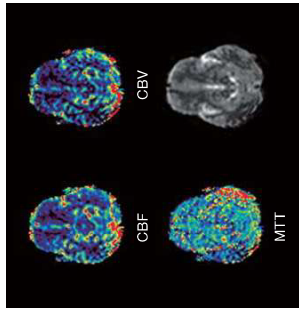
2048 x 2048 image reconstruction^{®2}

2048 x 2048 image reconstruction is made possible to support the high definition imaging diagnosis which is increasing in its importance.



FatSep function

Using the FatSep (water fat separation) function allows acquiring fat suppression images in a wide imaging area.



CE Perfusion^{®1} analysis

Perfusion imaging is an imaging method useful in the diagnosis of acute cerebral ischemia. A local inhomogeneity appears and the signal intensity changes when the contrast medium reaches the capillary vessels.

APERTO Lucent has enabled CE-Perfusion imaging that captures and images such minute changes with 0.4T static magnetic field intensity and the SuperShim^{®1} that is on board.

This feature is able to visualize signal changes of CBF (Cerebral Blood Flow), CBV (Cerebral Blood Volume) and MTT (Mean Transit Time) on the color display monitor incorporated in APERTO Lucent.

^{®1}: Optional function

^{®2}: Differs according to imaging condition.

Prime imaging capabilities

APERTO Lucent
Prime Open MRI

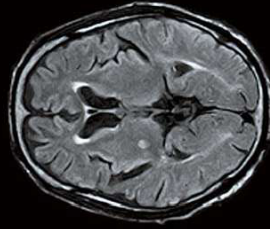
Brain [Cerebral infarction]



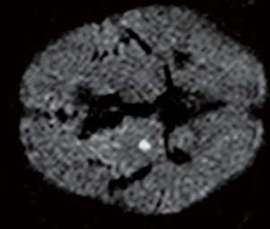
T2WI



T1WI

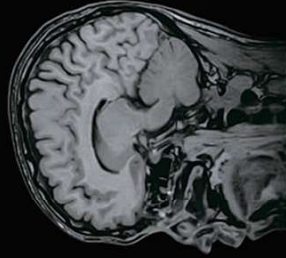


FLAIR

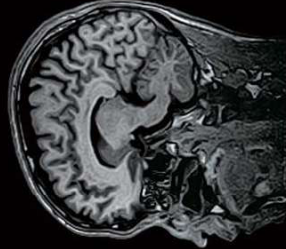


DWI

Brain 3D image

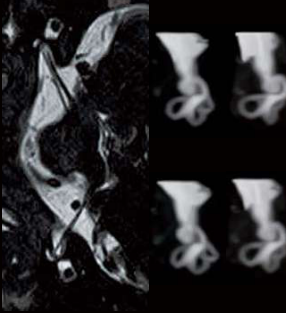


3D RSSG



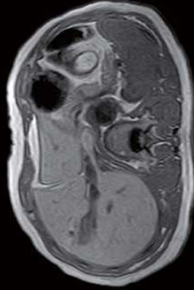
3D GEIR*

I.A.C.



3D T2WI (Upper) / MIP (Lower)

Liver (Dynamic) [Metastatic liver tumor (Gd-EOB-DTPA)]



T1WI
Non CE

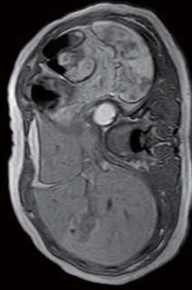
T2WI

Dynamic
DT=40_{sec}

Dynamic
DT=70_{sec}

Dynamic
DT=4_{min}

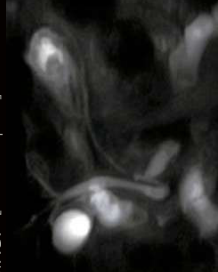
* "DT" stands for "Delay Time".



MRCP [Distention of the common bile duct]



MRCP [IPMN suspect]



3D respiratory gating

2D breath hold

Female pelvis [Uterine myoma]



T2WI

Aortic arch-Neck



MIP

Neck MRA Carotid bifurcation



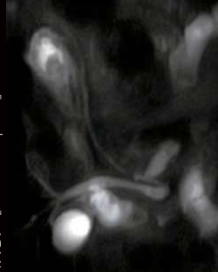
MIP

Brain MRA [Middle cerebral artery aneurysm]



MIP (Upper) / VR* (Lower)

Thoracic MRA [Aortic aneurysm]



MIP

VR*

Male pelvis [Prostate cancer]



T2WI

* Optional function

Prime imaging capabilities

APERTO Lucent
Prime Open MRI

Cervical spine [Neurileioma]



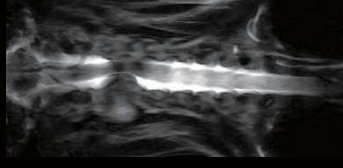
T2WI



T1WI

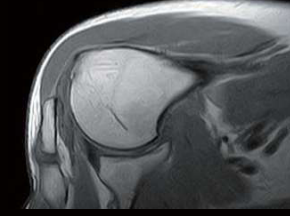


T2WI

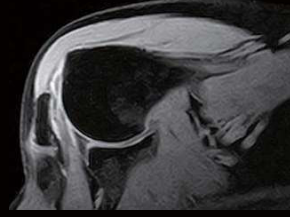


Myelography

Shoulder [Rotator cuff injury]



T1WI

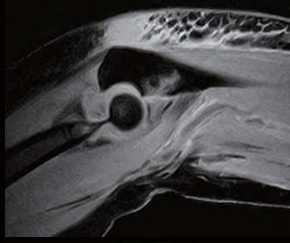


FatSep T2*WI

Elbow [Ulnar coronoid process fracture]

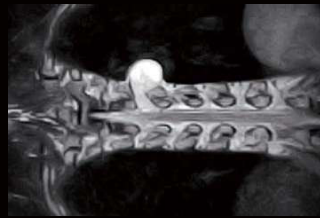


T1WI

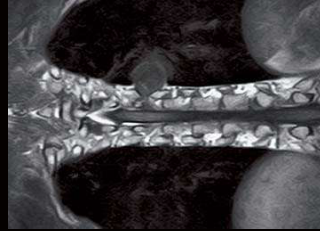


FatSep T2*WI

Thoracic spine [Tumor]



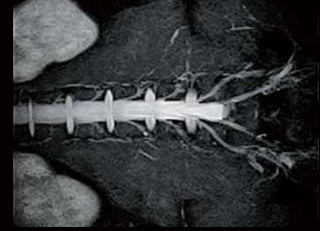
FatSep T2WI



FatSat* T1WI

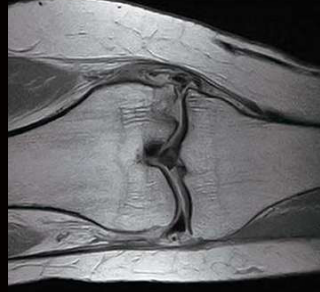


Spine neurography



STIR (with DE pulse)

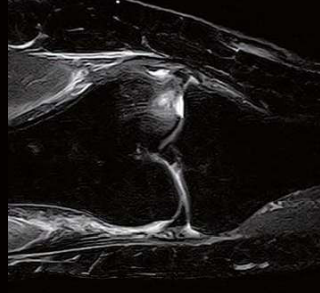
Knee [Bone necrosis]



T1WI



T2WI



FatSep T2WI

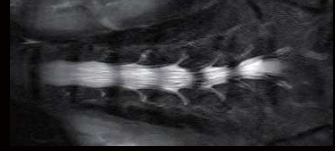
Lumbar spine [Spondylosis]



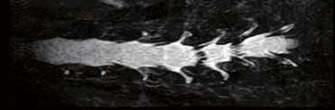
T2WI



T1WI



Myelography



Myelography (MPP)

Hip joint [Femoral fracture]



T2WI



STIR

Ankle [Calcaneal fracture]



T1WI



STIR

What the excellent interface of the Eterna produces.

High reliability in medical practice enabled by an environment of prompt and accurate operations.

For MRI, the obtained image quality is important, but the operability related to the improvement of examination throughput is also an important factor. Operability of APERTO Lucent is significantly improved by totally renewing GUI.

Not only the visual evolution of the screen display but also the operability has evolved by adoption of the wide LCD monitor, new system software with high performance, VR function and image positioning function, etc.,

APERTO Lucent has been largely improved in the aspect of operability as well as in its basic performance as an MRI system.

In addition, the system does not only acquire images but is compatible with the IHE KIN function^{#1} and IHE CPI function^{#1 and 2} for shared use of the acquired image information.

APERTO Lucent is an Open MRI that takes into consideration the shared use of image information.

Sophisticated operability



New system software

The intuitively understandable GUI (Graphic User Interface) and DICOM and IHE capabilities^{#1 and 2} – which provide for simplified entry of data for examination have been adopted.



Parameter guidance function

This function automatically displays several parameters which can substitute those that cannot be imaged in the case that such parameters are input.



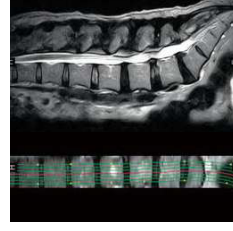
Wide LCD monitor

The monitor has not only been made larger but also allows the operator to obtain necessary information at once by displaying and arranging such information in an easy-to-understand way.



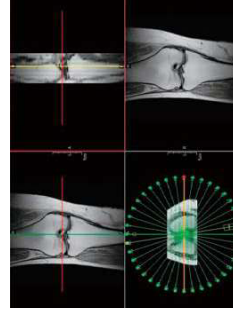
VR (Volume Rendering) image^{#1}

3D processing of MRI images tends to be increasing. "VR imaging" is a function for easily grasping the anteroposterior relations in an image by displaying MRA images and MRCP images in 3D. Also, "VR imaging" can be constructed in an MRI console.



Curved MPR

Arbitrary section images can be reconstructed from 3D image data. It allows simultaneous imaging of plural curves which is useful in the case of scoliosis.



Radial MPR

MPR images of radially positioned slice planes are created by easy operation. This feature is useful for diagnosis of complex structure such as knee joints.

#1 : Optional function

#2 : Connected equipment also needs to be compatible with these functions in order to utilize these functions.

In pursuit of the open design which functions gently for everybody.

The comfort and beauty of Lucent goes beyond the extreme.

MRI has such characteristics as "taking time in imaging" and "weak against examinees' movement".

You could also say that the examinees' cooperation is indispensable to obtain good images from the MRI.

APERTO Lucent has realized a wide open space thanks to its single-pillar structure, the only one among Hitachi's open MRI systems. This can provide the examinees with a more comfortable examination environment than the closed-MRI which, in turn, makes it easier to obtain the examinee's cooperation.

Hitachi believes that a design that has taken into consideration both examiners and examinees is an important part of the basic performance of the MRI system.

Prime open architecture



Open design

The offset position of the pillar makes it easier for the light to enter into the gantry center. The operator is free from anxiety when proceeding with an examination. Furthermore, a color scheme that would give the examinee a sense of security is adopted in considering the lighting environment inside the examination room.



Minimum table height

The table can be lowered to about 450mm allowing small children and elderly patients to get on and off the table with less load. Vertical movements are also motor driven.



Lateral slide

Because lateral movement of the table inside the gantry is possible, the body region that is out of the midline (shoulder joints, knee joints, etc.) can be set to the magnet field center.



Footswitch

The footswitch allows the table to move up and down or backward and forward. Freeing hands does not only improve the throughput but also enables meticulous care for the examinees.



Standard size of the imaging room is 2000mm×4000mm. (No any securing or enlargement of this size.)

Small footprint and cost saving features

Since the permanent magnet MRI requires neither large-scale incidental facilities nor disposable supply to maintain the magnetic field such as liquid helium, the installation area can be minimized as compared with the super conductive magnet MRI and the running cost can be suppressed to a low level.

Consideration for aftercare, running costs and the environment.

The real value of the Lucent is that it is an easy-to-use MRI from every aspect.

We believe that a system that can be used stably is important both for those who operate the system and those who undergo examinations.

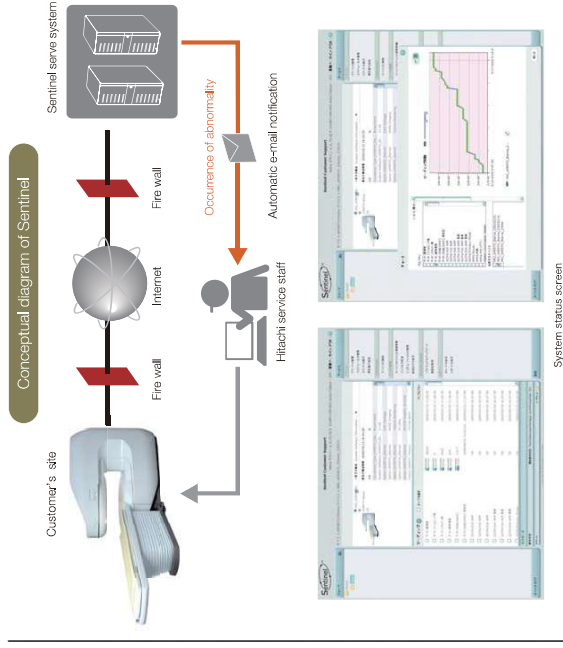
The Sentinel customer support* is available to ensure stable use of the APERTO Lucent for users.

The daily running costs are also an important factor from the viewpoint of TCO (Total Cost of Ownership).

By adopting a permanent magnet, the APERTO Lucent has realized a compact, power-saving system configuration so that the running costs can be reduced.

Being PRIME and yet compact. This is one of the fascinating points of the Lucent.

Prime customer support



Sentinel customer support* for APERTO Lucent

*: Optional function * *: Cost for establishing a network environment and the Internet connection shall be borne by the customer. The Sentinel customer support is a service accompanying the maintenance contract of the main MRI system.



APERTO Lucent

Prime Open MRI

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Hitachi Medical Corporation Medical System Operations Group, Kashiwa has established and maintains a quality management system according to ISO 9001, ISO 13485,



Hitachi Medical Corporation, Kashiwa-site, is certified as complying with the International Environmental Management System (ISO 14001).

Hitachi Medical Corporation

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