

**HITACHI**  
Inspire the Next



**AIRIS<sup>TM</sup>** *mate*

Creative Solution MRI



# AIRIS<sup>TM</sup> *mate*

**0.2T Permanent Magnet Type  
Creative Solution MRI**

## High Quality

Hitachi never compromise on quality over anything. To exceed the high expectations from our most demanding customers, we continually refine our world-class Open MRIs. AIRIS mate now shares the same console as those of our premium class permanent MRI system, APERTO.

## Patient & User-friendly System

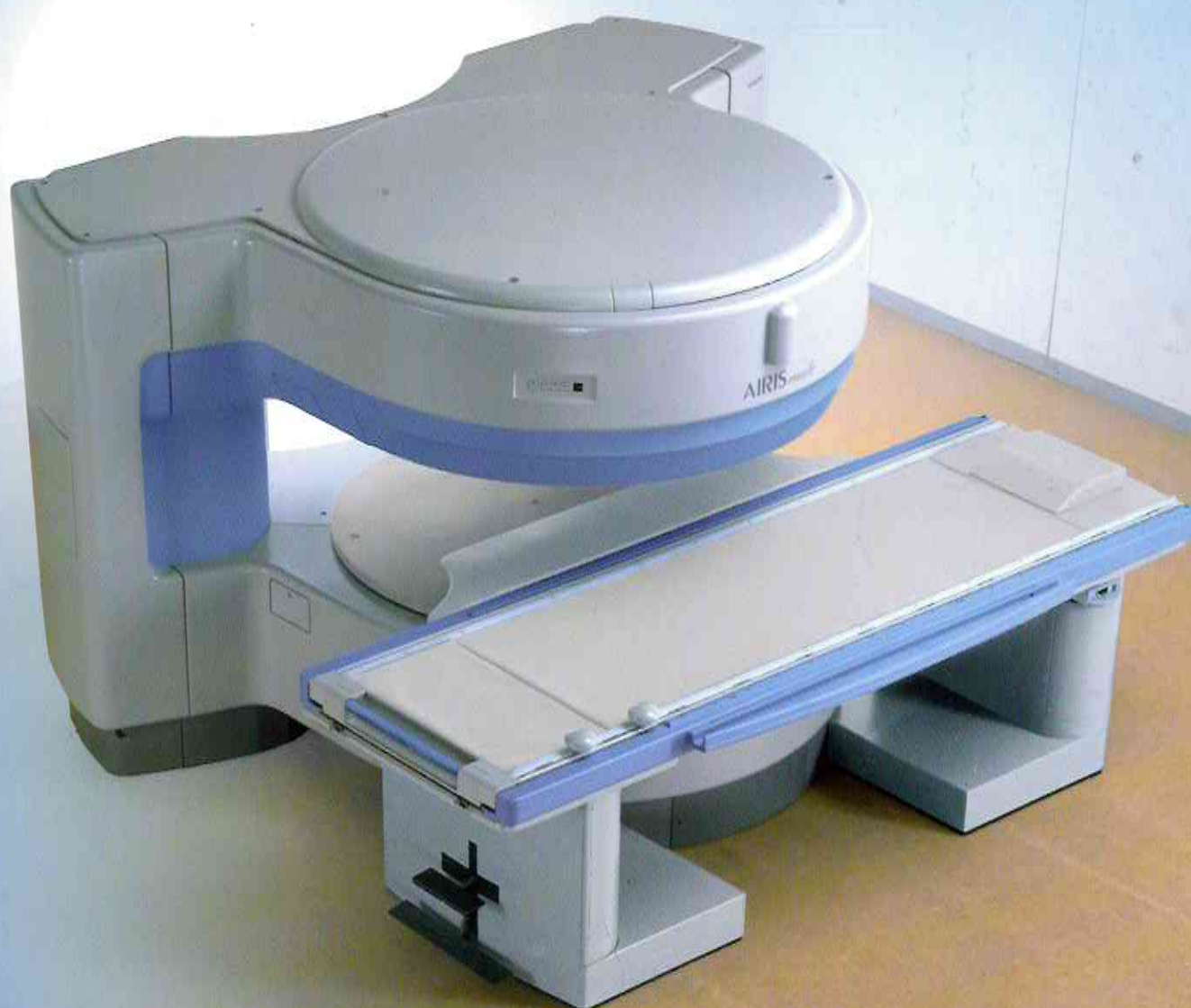
Hitachi continues to improve comfort and usability for both patients and operators. The addition of a new console together with the latest application package, ASCENDING 5.0, assists operators to examine regions which were previously hard to diagnose.

## Financial Advantage

One of the many reasons why Hitachi's Open MRI systems are chosen by many is its extremely low running cost and high patient throughput. Small installation space also contributes to minimal installation requirements and costs.



Hitachi brings AIRIS mate to a new level of performance. The pioneer of permanent MRI offers the optimal imaging solution with the Creative Solution MRI.

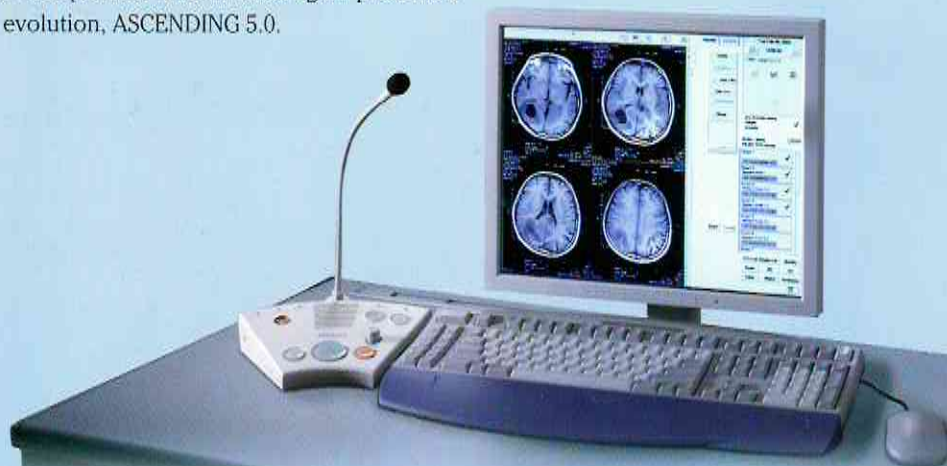


# High Quality

Application Package

## ASCENDING™ 5.0

Hitachi has been widely recognized as the leading company in Open MRI. Its DNA of openness is inherited not only in the gantry design however also in its scope of possibility into new areas of MRI diagnosis such as diversified applications and therapeutics. Hitachi once again presents a product of our continuous evolution, ASCENDING 5.0.

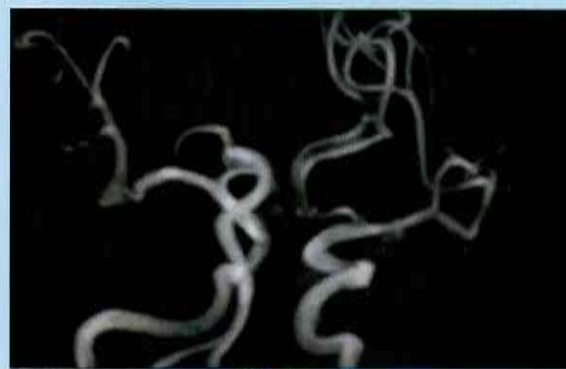


### Auto DICOM

Image data is automatically sent through the DICOM network after imaging is completed.

### Volume Rendering (option)

Volume rendering reproduces easy-to-understand images showing the positional relationships of blood vessels which are difficult to be seen in MIP images. Volume rendering is a powerful tool which can assist diagnosis of blood vessels.



MIP display

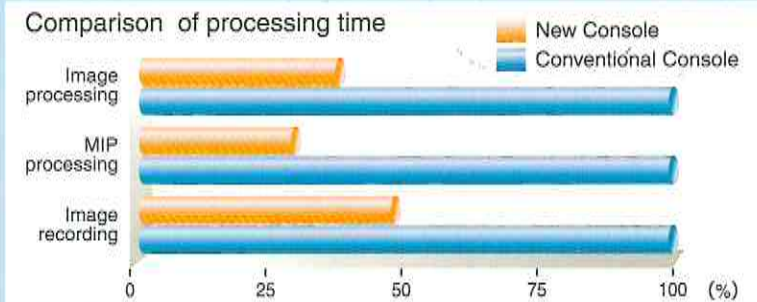


Volume rendering display



## New CPU

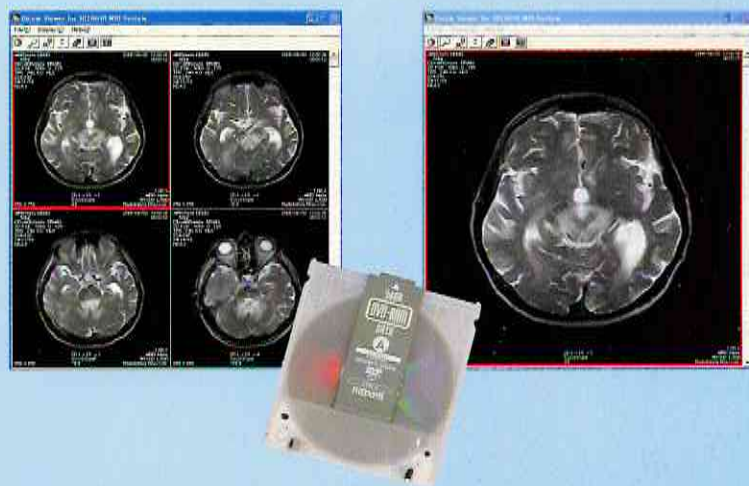
Dual CPU brings drastic improvement in various operations. Required time for image analysis such as for MIP processing, has decreased to below half of those of conventional systems. Dual CPU realizes high-speed parallel processing of multiple operations.



The graph above is an example comparing the time of one image processing. Processing time may differ from the figures above due to various conditions.

## DVD Multi-drive

DVD multi-drive replaces the MOD drives found on the conventional systems. The DVD multi-drive has a 9.4GB storage capacity along with faster writing/reading speed than those of MOD drives. Hitachi's dedicated imaging-viewer designed for Windows is automatically stored onto CD-R when image data is archived.



## Curved MPR

MPR (Multi Planar Reconstruction) is possible with user-set curves. Multiple lines parallel to the set line could be portrayed, where users could only set a single line until now. Large area of vertebral body could be taken with a single imaging for patients suffering from scoliosis.

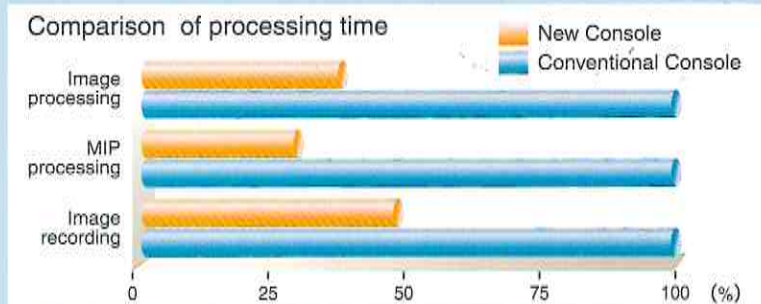


# AIRIS<sup>TM</sup>mate

0.2T Permanent Magnet Type  
Creative Solution MRI

## New CPU

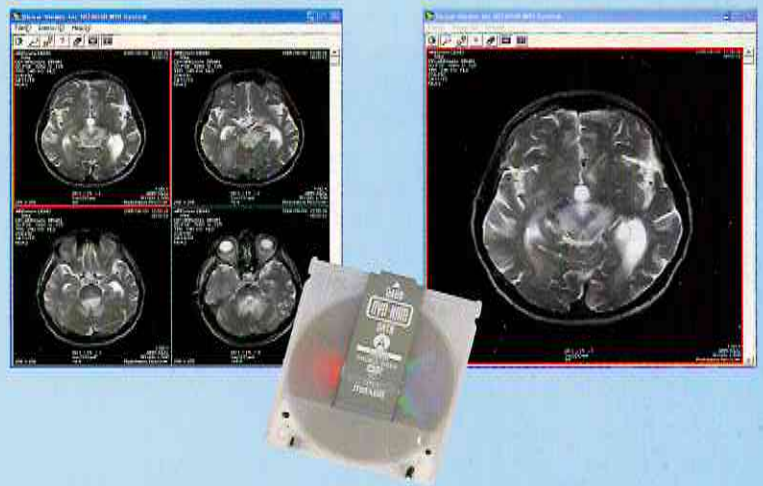
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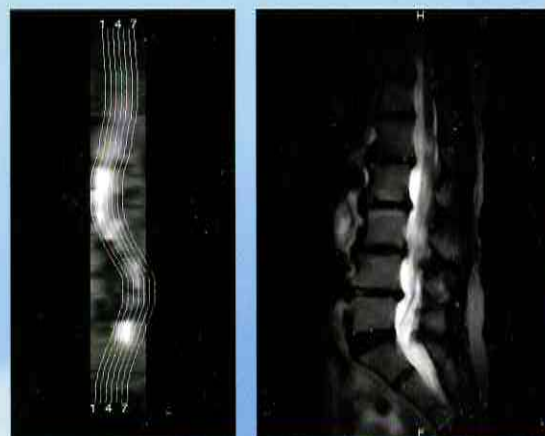
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# High Quality

The installation of more than 3800 Hitachi Open MRI systems\* speaks louder than its words. Hitachi strives to exceed expectations of our most demanding customers who never compromise high quality imaging over anything. The secret behind the market-proven reliability lies only in the decades of our concentrated R&D.

\* as of April 2006

## Secret of high quality imaging of Hitachi Open MRI

A MRI system is composed from several sub-systems. For this reason optimizing only one of the sub-systems will not lead to high image quality. In order to obtain high image quality, it is important to carefully determine the consistent specifications and design of not only the magnet but also such sub-systems as gradient magnetic field system, RF system and the computer system.

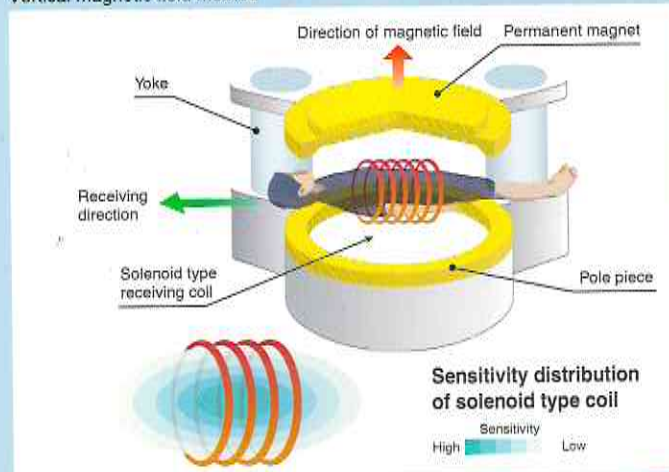
## Advantages of vertical magnetic field method

With a magnet placed above and below the gantry, vertical magnetic field is produced realizing signal reception along the body axis. Sensitive areas could be effectively utilized by winding solenoid coil around the object for imaging. On the contrary, with conventional horizontal magnetic field systems signals cannot be received along the body axis. Consequently, saddle-shaped coils or its similar type coils are used as receiving coils in conventional systems. Saddle coil's construction is as shown in the figure, sandwiching the imaging object with two loops, which wastes half of the sensitivity area. The difference of the total sensitivity between the two coils is more than 40% according to experiment, and approximately double in imaging time.

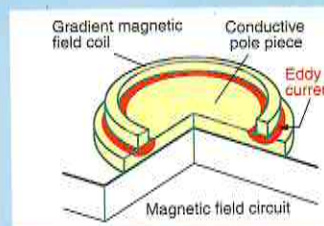
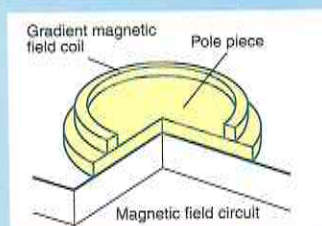
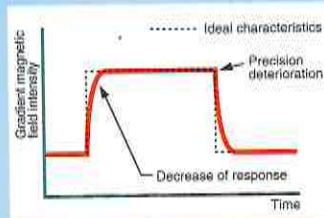
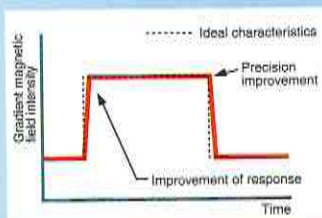
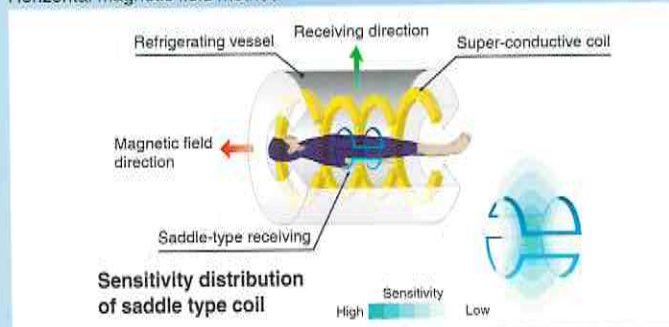
## Eddy-current-free magnetic circuit

A conductive pole piece placed behind the gradient magnetic field coil could cause problems such as reduced response and precision deterioration, since eddy current flows in the direction which cancels the gradient magnetic field. AIRIS mate uses an ingeniously developed pole piece made from non-conductive material to solve such problems.

Vertical magnetic field method



Horizontal magnetic field method





## Coils

Multiple Array Head Coil



Head and Neck Coil



Multiple Array Head-Neck Coil



Joint Coil (M)



TMJ Coil



Multiple Array Wrist Coil



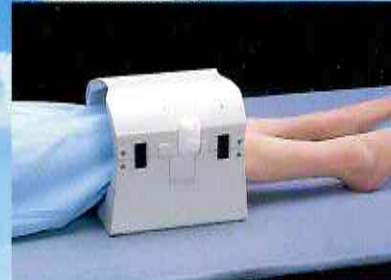
Joint Coil (L)



Breast Coil



Multiple Array Knee Coil



Multiple Array Shoulder Coil



Multiple Array Flexible Body Coil (M) (S, L)



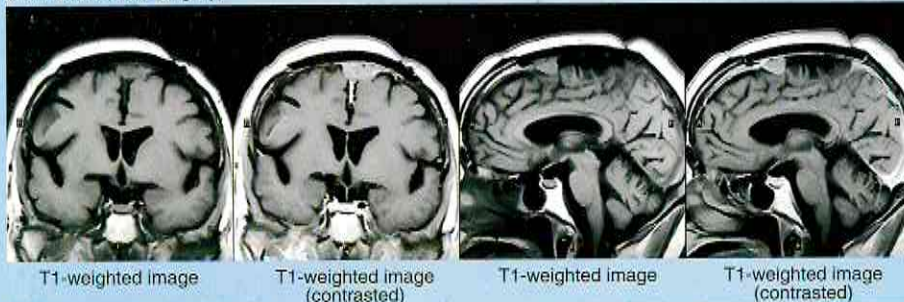
Joint Coil (S)





# High Quality

Brain tumor (after surgery)

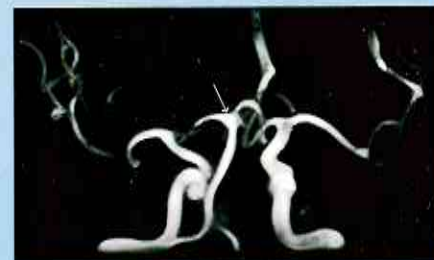


T1-weighted image

T1-weighted image (contrasted)

T1-weighted image

T1-weighted image (contrasted)



3D TOF MRA Brain aneurysm

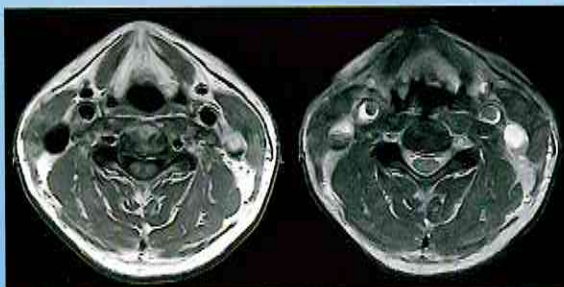


Joint motion study (T2\*weighted image)  
Cervical disease+nerve root disease

2D TOF MRA  
Carotid stenosis



Herniated intervertebral discs  
Left: T1-weighted image  
Right: T2\*weighted image



Herniated intervertebral discs



T1-weighted image

T2-weighted image

Herniated intervertebral discs



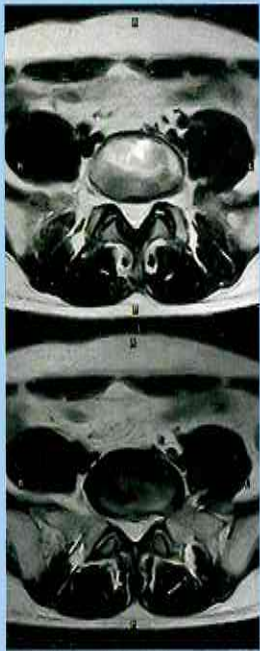
T1-weighted image

T2-weighted image

Upper: T1-weighted image  
Lower: T2-weighted image

Uncompromising Image Quality





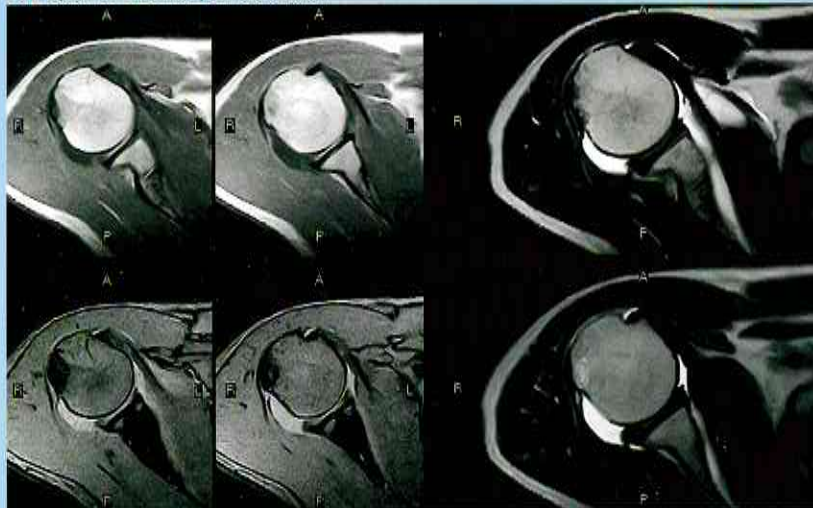
T2-weighted image  
Herniated intervertebral discs

Slipped discs



T1-weighted image T2-weighted image T1-weighted image T2-weighted image T1-weighted image T2-weighted image

Left repetitive shoulder joint dislocation



Upper: T1-weighted image  
Lower: T2-weighted image

T2-weighted image

T2\*weighted image

All-layers fragmentation of supraspinal tendon



Recurrent dislocation of right shoulder joint



Gradient Echo



# High Quality

## Operation

Real-time MIP



### Easy Operation

The combination of scan parameters is infinite, with its wide variation range. In accordance with imaging area and required type of imaging, optimal combination of parameters and order of imaging is preset to ease the workload of selecting the parameters at each time of scanning. Operators need only to call out the protocol set from the clinical study library.

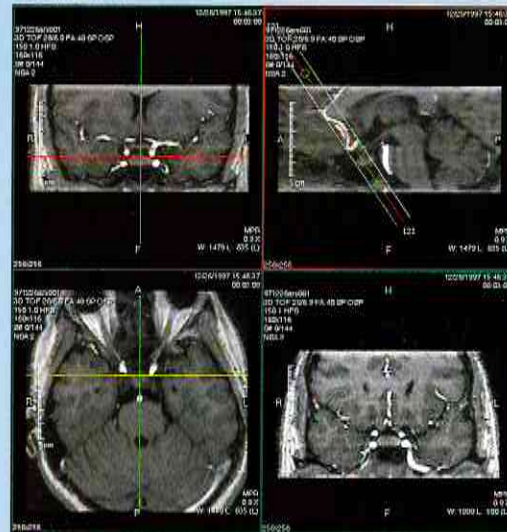
### Guidance Assistance

Guidance calls attention of the operator to make various parameter settings, when a value set exceeds the determined area.

### Network Establishment

DICOM 3.0\* realizes easier network establishment and compatibility with DICOM printing and modality work list.

Real-time MPR



### Real-time Processing

The new console realizes high-speed computation enabling real-time 3D data processing.

#### Real-time MIP

Selection and deletion of unnecessary regions could be done easily by delineating free curves on 3D images such as angiographic images. Real-time rotation display realizes the creation of rotating images in short time by simply setting angle steps.

#### Real-time MPR

Arbitrary curved section can be reconstructed from 3D data in real-time. Together with 3D imaging sequence, this function could be useful in image analysis of complicated articular and head regions.

### Flexible Setting

Flexible settings of high function parameters, such as FOV, TR and TE, in 0.1ms increments, widens the field of clinical applications.





### **DWI:** [Single Shot EPI] \*

EPI (Echo Planar Imaging) sequence was realized by the combination of powerful gradient magnetic field system and high precision permanent magnet technology. Depending on the situation, it is possible to apply Single Shot EPI or Multi-shot EPI.

### **BASG:** [Balanced SARGE] \*

Improvement of static magnetic field intensity and precision control of RF pulse and gradient magnetic field realized Balanced SARGE. By attaining a perfectly stabilized condition, Balanced SARGE enables acquisitions of high S/N images in short time.

### **DE-FSE:** [Driven Equilibrium-FSE] \*

Since DE-FSE restores horizontal magnetization, which remains after signal measurement, to vertical magnetization, it enables high speed imaging of high quality T2-weighted images.

### **CE-MRA:** [Contrast Enhanced-MRA] \*

Contrast Enhanced-MRA realizes acquisition of wide field-of-view images of the blood vessels in short time. Breath hold imaging technique further broadens its application area into new territories.

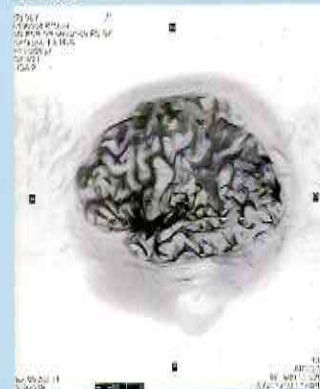
### **Fat/Water Separation Measurement**

Fat/Water Separation Measurement broadens examination field by suppressing fat signals in such areas as optic nerve, breast, pelvis and joints.

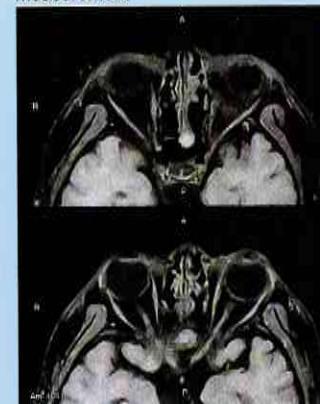
DWI



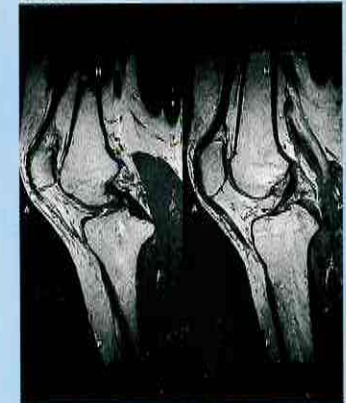
DE-FSE



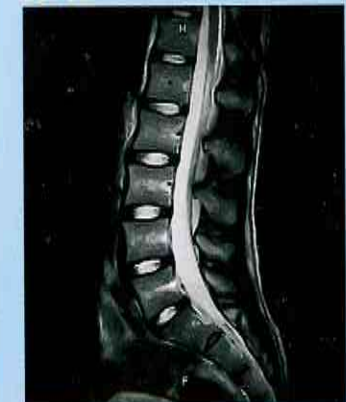
Fat-Water Separation Measurement



BASG



DE-FSE



\* : Option



# Patient & User-friendly System

"Patient-friendly"—this is the DNA in all Hitachi Open MRI systems. When Hitachi develops and designs Open MRI system, we always think primarily of patient comfort. Our pursuit for connection with each and every patient in the world is what our Open MRI system is all about.



The state-of-the-art design inherited from the original AIRIS system realized the compact, wide-open gantry with a 230 degrees front and 70 degrees rear opening for quieter, brighter and more comfortable MRI examination.

With its imaging performance and functions further evolved, AIRIS mate opens the doors to broader field of activity of diagnosis and therapy.

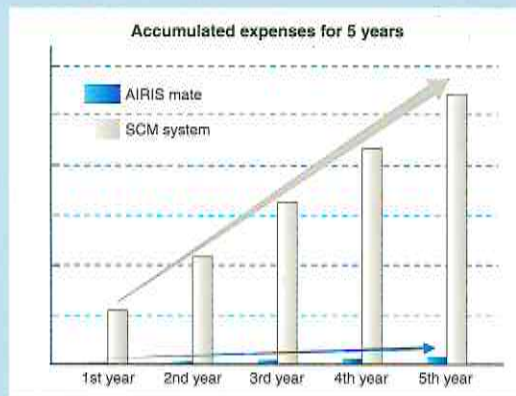
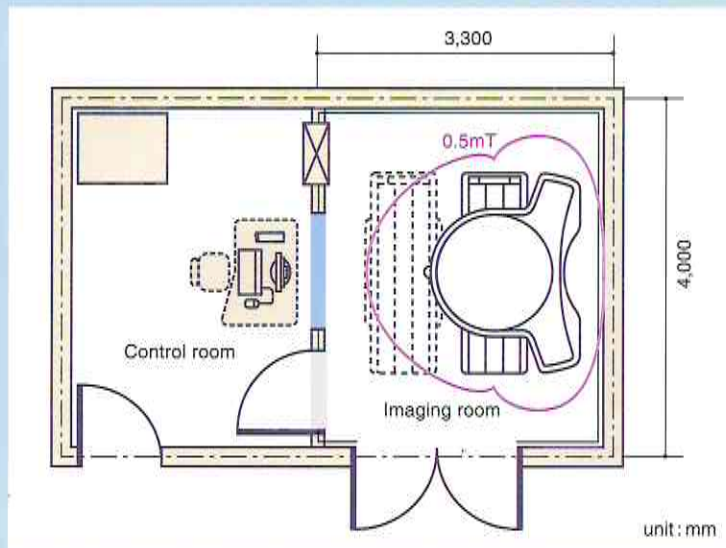


## AIRIS<sup>TM</sup> mate

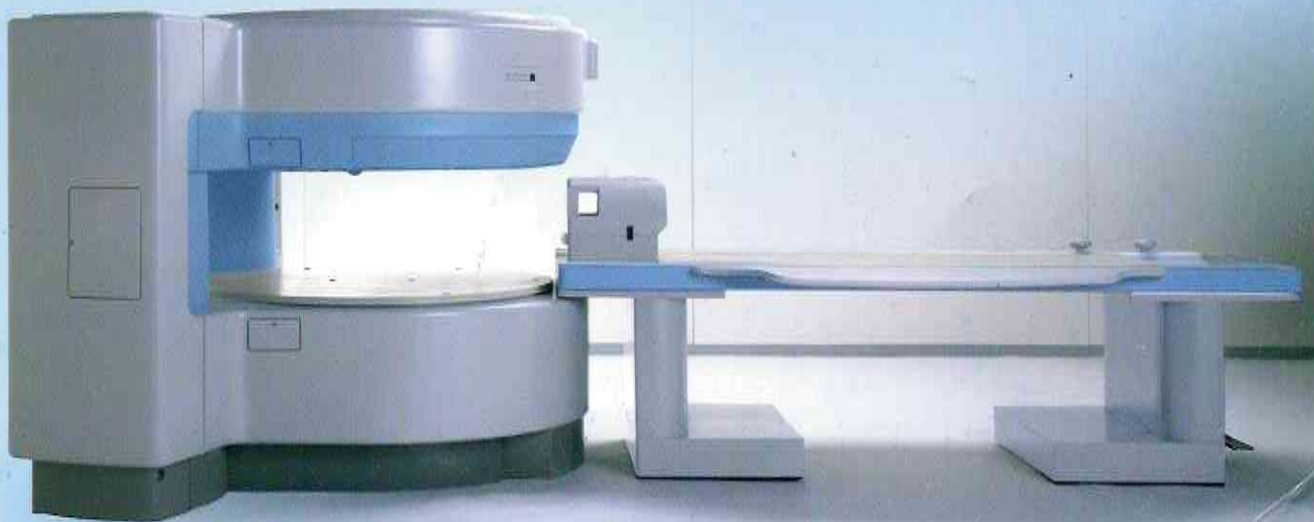
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Creative Solution MRI

# Financial Advantage

Included in the list of what must be considered when installing a MRI system are siting and cost. Along with image quality and function, here lies the reason behind the choice everyone makes of this internationally appraised Open MRI system.



AIRIS mate has an outstanding economic advantage with power consumption of only approximately 3kW. Without the need of a machine room, standard installation space of AIRIS mate is less than 25m<sup>2</sup>. Even in such small space the 0.5mT line lies within the imaging room. Installation flexibility is further enhanced with the patient bed which could be installed either in horizontal or vertical direction to the gantry.







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, Medical System  
Operation Group, is certified as complying  
with the International  
Environmental Management System (ISO 14001).

- Specifications and physical appearance may be changed without prior notice for improvement of performance.
- Be sure to read Instruction Manual for correct operation of the equipment.
- Windows® is a registered trade name of Microsoft, Inc.

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