COMPARISON CHART

Wide Bore MRI Systems, 1.0T or higher

October 2012 Comparison Chart Compiled by Imaging Technology News
Scranton Gillette Communications assumes no responsibility or liability for any errors or omissions in this chart.

Editor's Note: All submitted information also appears on our website at **www.ITNonline.com**.

N/A = Not applicable N/S = Not specified

Company	Hitachi Medical Systems America	Philips Healthcare		Siemens Medical Solutions					Toshiba America Medical Systems	
Model	Echelon Oval	Ingenia 1.5T	Ingenia 3.0T	Magnetom Skyra	Magnetom Aera	Magnetom Verio	Magnetom Espree	Magnetom Espree-Pink	Vantage Titan	Vantage Titan
FDA Cleared (Year)	2012	2011	2011	2010	2010	2007	2004	2004	2012	2010
Clinical Application	Whole body	Whole body	Whole body	Whole body	Whole body	Whole body	Whole body	Dedicated breast MRI / optional whole body	Whole body	Whole body
MAGNET										
Configuration	Wide-oval bore	Wide-bore	Wide-bore	Open-bore	Open-bore	Open-bore	Open-bore	Open-bore	Ultra-short bore	Ultra-short bore
Type	Superconducting	Superconducting	Superconducting	Superconducting	Superconducting	Superconducting	Superconducting	Superconducting	Superconducting	Superconducting
Field Strength, Tesla (T)	1.5	1.5	3.0	3.0	1.5	3.0	1.5	1.5	1.5	3.0
Homogeneity (35 or 40 cm DSV), Vrms (Guaranteed)	0.75 ppm Vrms @ 40 cm DSV	< 0.5 ppm @ 40 cm DSV	< 0.4 ppm @ 40 cm DSV	1.4 ppm @ 40 cm DSV, Vrms	1.4 ppm @ 40 cm DSV, Vrms	1.4 ppm @ 40 cm DSV, Vrms	< 5 ppm @ 40 cm DSV	< 5 ppm @ 40 cm DSV	1 ppm or less @ 40 cm DSV	1.4 ppm or less @ 40 cm DSV
Homogeneity (35 or 40 cm DSV), Vrms (Typical)	0.2 ppm Vrms @ 40 cm DSV	N/S	N/S	1.2 ppm @ 40 cm DSV, Vrms	1.2 ppm @ 40 cm DSV, Vrms	1.2 ppm @ 40 cm DSV, Vrms	N/S	N/S	N/A	N/A
5-Gauss Fringe Field, Radial/Axial, m	4 / 2.5	2.4 / 3.8	3.05 / 4.95	2.6 / 4.6	2.5 / 4	2.6 / 4.6	2.5 / 4	2.5 / 4	3 / 5	2.6 / 4.6
Per-patient Active Shimming Features	High order active shim technology	3 x linear	3 x linear, 5 x HOS	3 linear with 20 coils, 5 nonlinear 2nd-order	3 linear with 20 coils, 5 nonlinear 2nd-order	Passive, active; 1st-order standard / 2nd-order standard	Passive, active; 1st-order standard / 2nd-order standard	Passive, active; 1st-order standard / 2nd-order standard	Active, auto active	Active, auto active
Cryogen Refill Interval, Year	1 time per 6 years with 4k He refrigerator	Zero boil off, not applicable	Zero boil off, not applicable	Zero boil, approx .10 years	Zero boil, approx. 10 years	Zero boil, approx. 10 years	Zero boil, approx .10 years	Zero boil, approx. 10 years	24-36 months	Zero boil off, > 36 months
Finished (Covered) Gantry Weight, kg	5,200	3,060	4,600	5,768	3,121	8,200 in operation	5,100 in operation	5,100 in operation	5,400	7,800
Finished (Covered) Gantry Dimension (L x W x H), cm	Short-bore length 160 x 220 x 220	1.5 x 1.88 x 2.29	1.64 x 1.88 x 2.29	173 x 231 x 219	145 x 231 x 219	173 x 230 x 222	125 x 230 x 225	125 x 230 x 225	149.5 x 201.5 x 241	181.8 x 201.5 x 241
PATIENT MANAGEMENT/COMFORT										
Minimum Finished Bore L-R Diameter, cm (Closed Magnet), Measured at Isocenter	74	70	70	70	70	70	70	70	71 aperture, 69 at middle of bore	71 aperture, 69 at middle of bore
Minimum A-P Dimension With Table Inserted, cm, Measured at Isocenter, Including Spine Coil, But Not Mat	48	N/S	N/S	55	55	55	55	55	52.9	52.9
Dockable Table (Standard or Option)	Standard	Option	Option	Option	Option	N/A	N/A	N/A	N/A	N/A
Table Width (Moving Portion), cm	63	64	64	N/S	N/S	N/S	N/S	N/S	52	52
Table Capacity, lbs	550	550	550	550	550	550	550	550	440 standard, 550 optional	440
Table Vertical Travel (Min Height - Scanning Height), cm	50 - 84	59 - 82	59 - 82	52 minimum H	52 minimum H	50 minimum H	47 minimum H	47 minimum H	43 - 84.5	43 - 84.5
Table Longitudinal Movement Range, cm	279	200	200	Max. scan 140, optional 205	Max. scan 140, optional 205	Max. scan 140, optional 196	Max. scan 154, optional 205	Max. scan 205	205	205
Table Lateral Movement Range (Extreme L - Extreme R), cm	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Feet-First Imaging for all Regions (Yes/No)	Yes	Yes	Yes	Yes, except for head/neck coil	Yes, except for head/neck coil	Yes, except for head/neck coil	Yes, except for head/neck coil	Yes, except for head/neck coil	Yes, shoulders to feet	Yes, shoulders to feet
Gantry-Mounted Operator-Controlled LCD (Yes/No)	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Patient Cooling Features	Yes	In-bore ventilation (5 settings)	In-bore ventilation (5 settings)	In-bore ventilation (3 levels)	In-bore ventilation (3 levels)	In-bore ventilation (3 levels)	In-bore ventilation (3 levels)	In-bore ventilation (3 levels)	Yes	Yes
Operator Call	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Patient - Operator Intercom	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Patient illumination Features	Yes	Yes, plus Ambient ring	Yes, plus Ambient ring	In-bore lighting (3 levels)	In-bore lighting (3 levels)	In-bore lighting (3 levels)	In-bore lighting (3 levels)	In-bore lighting (3 levels)	Yes	Yes
GRADIENT										
Maximum Amplitude, Single Axis, mT/m (X, Y and Z)	34	45	45	45	33 or 45	45	57 effective	57 effective	34	30
Maximum Slew Rate, Single Axis, T/m/s (X, Y and Z)	150	200	200	200	200	200	170	100	148	203
Cooling System Type	Water	Liquid	Liquid	Water	Water	Water	Water	Water	Water	Water
COMPUTER SYSTEM										
CPU Type	Core i5 3.33 GHz	Quad Core Intel 2.8 GHz	Quad Core Intel 2.8 GHz	Intel Xeon ≥ W3520 Quad Core	Intel Xeon ≥ W3520 Quad Core	2x Pent. IV / Intel Xeon	2x Dual Core Intel Xeon	2x Dual Core Intel Xeon	Intel Xeon 6-Core Dual	Intel Xeon 6-Core Dual
CPU Memory Size, MB	8,000	8 GB	8 GB	4 GB RAM	4 GB RAM	4 GB RAM	4 GB RAM	4 GB RAM	12 GB Main Memory	12 GB Main Memory
Reconstruction Hardware	Core i5 3.33 GHz	Quad Core Intel 3.6 GHz	Quad Core Intel 3.6 GHz	Intel ≥ E5540 Quad Core	Intel ≥ E5540 Quad Core	2x AMD Opt. (Linux 64-Bit)	2x AMD Opt. (Linux 64-Bit)	2x MD Opt. 248 CPU	8,800 images per second	4,400 images per second
Reconstruction Memory Size, MB	8,000	36 GB	36 GB	48 GB RAM	48 GB RAM	≥ 8 GB RAM	8 GB RAM	16 GB RAM	12 GB	12 GB
Image Storage Media Type	HDD, DVD, CD-R	DVD+RW	DVD+RW	CD ROM / DVD-R, USB Drive	CD ROM / DVD-R, USB Drive	CD ROM / DVD-R, USB Drive	CD ROM / DVD-R, USB Drive	CD ROM / DVD-R, USB Drive	DVD 9.4 GB	DVD 9.4 GB
Image Storage Media Image Capacity	HDD 320 GB; DVD 4.7 GB, CD-R for an exam	300,000 images local	300,000 images local	25,000 images 256^2	25,000 images 256^2	25,000 images 256^2	25,000 images 256^2	25,000 images 256^2	44,000 DVD image capacity	44,000 DVD image capacity
DICOM 3.0 Classes Supported (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display Monitor Displayable Area (L x W), cm	24-in. diagonal	23-in. 1,900 x 1,200 resolution	23-in. 1,900 x 1,200 resolution	1,280 x 1,024 full screen	1,280 x 1,024 full screen	1,280 x 1,024 full screen	1,280 x 1,024 full screen	1,280 x 1,024 full screen	24-in. LCD (1,920 x 1,200)	24-in. LCD (1,920 x 1,200)
Simultaneous Scan and Reconstruction, (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RF SYSTEM										
Channels (Minimum, Maximum Configuration)	16	Channel independent	Channel independent	48, 64, 128	48, 64	8, 18, 32	8, 18, 32	18, 32	8, 16 or 32	16 or 32
Parallel Imaging Features (Name, Image/K-Space)	RAPID, Image	dS-SENSE, ktBLAST (k-space, image)	dS-SENSE, ktBLAST (k-space, image)	iPAT, mSENSE and GRAPPA (image, k-space)	iPAT, mSENSE and GRAPPA (image, k-space)	iPAT, mSENSE and GRAPPA (image, k-space)	iPAT, mSENSE and GRAPPA (image, k-space)	iPAT, mSENSE and GRAPPA (image, k-space)	SPEEDER	SPEEDER
Analog-to-Digital Conversion at Gantry (Yes/No)	Yes	Inside the RF coils	Inside the RF coils	Yes	Yes	No	No	No	No	No
Optical Transmission	Yes	Digital broadband signal transfer	Digital broadband signal transfer	Yes	Yes	No	No	No	No	No
COILS (STANDARD/OPTIONAL, # OF ELEMENTS, RF CHANNELS, PARALLEL IMAGING SUPPORT)										
Brain	Standard, 19, 15, yes	Standard, 15 ch, channel independent, dS-SENSE	Optional, 32 ch, channel independent, dS-SENSE	With head coil	With head coil	With head coil	With head coil	N/A	Atlas SPEEDER head, standard, 14 elements, parallel imaging capable	Atlas SPEEDER head, standard, 16 elements, parallel imaging capable
Head	Standard, 19, 15, yes	Standard, 15 ch, channel independent, dS-SENSE	Standard, 15 ch, channel independent, dS-SENSE	Standard, 16 e, 20 e with neck; 48 ch, 64 ch (opt); iPAT	Standard, 16 e, 20 e with neck; 48 ch, 64 ch (opt); iPAT	Standard,12 e, 32 e (opt); 8 ch, 18 ch, 32 ch (opt); iPAT	Standard,12 e, 32 e (opt); 8 ch, 18 ch, 32 ch (opt); iPAT	N/A	Atlas SPEEDER head, standard, 14 elements, parallel imaging capable	Atlas SPEEDER head, standard, 16 elements, parallel imaging capable
Spine	Standard, 20, 16, yes	Standard, 44 ch, channel independent, dS-SENSE	Standard, 44 ch, channel independent, dS-SENSE	Standard, 32 e; 48 ch, 64 ch / 128 ch (opt); iPAT	Standard, 32 e; 48 ch, 64 ch (opt); iPAT	Standard, 24 e; 8 ch, 18 ch, 32 ch (opt); iPAT	Standard, 24 e; 8 ch, 18 ch, 32 ch (opt); iPAT	N/A	Atlas SPEEDER spine, standard, 32 elements, parallel imaging capable	Atlas SPEEDER spine, standard, 40 elements, parallel imaging capable
Neck	Standard, 18, 12 to 16, yes	Standard, 20 ch, channel independent, dS-SENSE	Standard, 20 ch, channel independent, dS-SENSE	Optional, 4 e, 20 e with head coil; 48 ch, 64 ch / 128 ch (opt); iPAT	Optional, 4 e, 20 e with head coil; 48 ch, 64 ch (opt); iPAT	Optional, 4 e,16 e (opt); 8 ch,18 ch, 32 ch (opt); iPAT	Optional 4 e; 8 ch,18 ch, 32 ch (opt); iPAT	N/A	Atlas SPEEDER head-cervical, standard, 17 elements, parallel imaging capable	Atlas SPEEDER head-cervical, standard, 16 elements, parallel imaging capable
Shoulder	Standard, 5, 5, yes	Optional, 8 ch, channel independent, dS-SENSE	Optional 8 ch, channel independent, dS-SENSE	Optional, 16 e, 16 ch; iPAT	Optional, 16 e, 16 ch; iPAT	Optional, 4e; 4 ch; iPAT	Optional, 4 e; 4 ch; iPAT	N/A	Shoulder SPEEDER, optional, 6 elements, parallel imaging capable	Shoulder SPEEDER, optional, 6 elements, parallel imaging capable
Body/Torso	Standard 8, up to 16 ch with spine coil, yes	Optional, 32 ch, channel independent, dS-SENSE	Optional, 32 ch, channel independent, dS-SENSE	Standard, 18 e / 30 e combined with spine; 48 ch, 64 ch / 128 ch (opt); iPAT	Standard, 18 e / 30 e combined with spine; 48 ch, 64 ch / 128 ch (opt); iPAT	Standard, 6 e / 12 e combined with spine; 8 ch, 18 ch, 32 ch (opt); iPAT	Standard, 6 e / 12 e combined with spine; 8 ch, 18 ch, 32 ch (opt); iPAT	N/A	Atlas body SPEEDER, standard, 16 elements, parallel imaging capable	Atlas body SPEEDER, standard, 16 elements, parallel imaging capable
Knee	Standard, 12, 12, yes	Optional, 8 ch or 16 ch, channel independent, dS-SENSE	Optional, 8 ch or 16 ch, channel independent, dS-SENSE	Optional, 15 ch; iPAT	Optional, 15 ch; iPAT	Optional, 8 ch or 15 ch; iPAT	Optional, 8 ch or 15 ch; iPAT	N/A	Knee SPEEDER, optional, 8 elements, parallel imaging capable	Knee SPEEDER R/T, optional, 7 elements, parallel imaging capable
Cardiac	Optional, 6, up to 16 with P-head and spine coil, yes	Optional, 32 ch, channel independent, dS-SENSE	Optional, 32 ch, channel independent, dS-SENSE	Standard, 18 e / 30 e combined with spine; 48 ch, 64 ch / 128 ch (opt); iPAT	Standard, 18 e / 30 e combined with spine; 48 ch, 64 ch / 128 ch (opt); iPAT	Standard, 6 e / 12 e combined with spine; 8 ch, 18 ch, 32 ch (opt); iPAT	Standard, 6 e / 12 e combined with spine; 8 ch, 18 ch, 32 ch (opt); iPAT	N/A	Atlas body SPEEDER + Atlas SPEEDER spine, standard, 16 elements + 32 elements, parallel imaging capable	Atlas body SPEEDER, standard, 16 elements, parallel imaging capable
Breast	Optional, 7, 7, yes	Optional, 7 ch or 16 ch, channel independent, dS-SENSE	Optional, 7 ch or 16 ch, channel independent, dS-SENSE	Optional, 4 e, 8 e, 16 e; 4 ch, 8 ch, 16 ch; iPAT	Optional, 4 e, 8 e, 16 e; 4 ch, 8 ch, 16 ch; iPAT	Optional, 4 e, 7 e, 16 e; 4 ch, 7 ch, 16 ch; iPAT	Optional, 4 e, 7 e, 16 e; 4 ch, 7 ch, 16 ch; iPAT	Standard 2 e, 4 e, 8 e; 18 ch; iPAT	Sentinelle SPEEDER or Invivo SPEEDER, optional, 8 or 7 elements (respectively), parallel imaging capable	Sentinelle SPEEDER or Invivo SPEEDER, optional, 8 elements, 8 RF, parallel imaging capable
Wrist	Optional, 7, 7, yes	Optional, 8 ch, channel independent, dS-SENSE	Optional, 8 ch, channel independent, dS-SENSE	Optional, 16 ch; iPAT	Optional, 16 ch; iPAT	Optional, 8 e; 8 ch; iPAT	Optional, 8 e; 8 ch; iPAT	N/A	Wrist SPEEDER, optional, 6 elements, parallel imaging capable	Wrist SPEEDER, optional, 6 elements, parallel imaging capable
Neurovascular	Optional, 22, 15, yes	Standard, 20 ch, channel independent, dS-SENSE	Standard, 20 ch, channel independent, dS-SENSE	Standard, up to 30 e in combination with TIM 4G coils; iPAT	Standard, up to 30 e in combination with TIM 4G coils; iPAT	Standard, up to 28 e in combination with TIM coils; iPAT	Standard, up to 28 e in combination with TIM coils; iPAT	N/A	Atlas SPEEDER head-cervical, standard, 17 elements, parallel imaging capable	Atlas SPEEDER head-cervical, standard, 16 elements, parallel imaging capable
Peripheral Vascular	Optional 16, 8 to 12 with torso and spine coil, yes	Standard, 60 ch, channel independent, dS-SENSE	Standard, 60 ch, channel independent, dS-SENSE	Optional, 36 e; up to 40 e in combination with TIM 4G; iPAT	Optional, 36 e; up to 40 e in combination with TIM 4G; iPAT	Optional, 36 e; 8 ch, 18 ch, 32 ch (opt); iPAT	Optional, 36 e; 8 ch, 18 ch, 32 ch (opt); iPAT	N/A	Atlas body SPEEDER + Atlas SPEEDER spine, standard, 16 elements + 32 elements, parallel imaging capable	Atlas body SPEEDER + Atlas SPEEDER spine, standard, 16 elements + 40 elements, parallel imaging capable
Foot / Ankle	Optional 8, 8, yes	Optional, 8 ch, channel independent, dS-SENSE	Optional, 8 ch, channel independent, dS-SENSE	Optional,16 e, 16 ch pending; iPAT	Optional,16 e, 16 ch pending; iPAT	Optional, 8 e, 8 ch; iPAT	Optional, 8 e, 8 ch; iPAT	N/A	QD knee-foot SPEEDER, optional, 4 elements, parallel imaging capable	Flex SPEEDER coil, 4 elements, parallel imaging capable (WIP)
Others	Flex Extremity standard 4, 4 yes; MP standard 2, 2 yes; Micro optional 1, 1, no	N/S	N/S	Multi-purpose flex coils (4 ch, iPAT)	Multi-purpose flex coils (4 ch, iPAT)	Multi-purpose flex coils (4 ch, iPAT)	Multi-purpose flex coils (4 ch, iPAT)	N/A	Flex SPEEDER coil (medium and large), 16 elements, parallel imaging capable	32 channel SPEEDER head, 32 elements, parallel imaging capable
IMAGING FEATURES										
Noncontrast Angiography	VASC-ASL; VASC-FSE; BeamSat	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Fresh blood imaging (FBI), contrast-free improved angiography (CIA), time-SLIP: spatial labeling inversion pulse, time space angiography (TSA)	Fresh blood imaging (FBI), contrast-free improved angiography (CIA), time-SLIP: spatial labeling inversion pulse, time space angiography (TSA)
Plaque Imaging and Color Analysis	SIR map with RADAR-SE T1WI	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A
Selective MRA with Cylindrical-Shaped Saturation	BeamSat TOF	Yes	Yes	No	No	No	No	N/A	Yes	Yes
Spectroscopy	MRS / CSI	2-D, 3-D SENSE spectro	2-D, 3-D SENSE spectro	Yes	Yes	Yes	Yes	Yes	Single and multi-voxel	Single and multi-voxel
Motion Compensating Radial Techniques	RADAR	Yes, MultiVane	Yes, MultiVane	Yes, standard	Yes, standard	Yes, standard	Yes, standard	Yes, standard	JET	JET
Motion Compensating Radial Techniques with Parallel Imaging for all Regions	RAPID RADAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	JET	JET
Brain Volume Imaging	isoFSE / 3DGEIR	3-D BrainView	3-D BrainView	Yes	Yes	Yes	Yes	N/A	Yes	Yes
Ultra-Short TE (TE < 1 ms, Multi-Slice)	uTE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Minimum Repetition Time (3-D T1 Spoiled Gradient Echo), msec	1.4	3-D FFE 0.95 (256 matrix)	3-D FFE 0.95 (256 matrix)	3-D GRE 0.95 (256 matrix)	3-D GRE: 0.95 (256 matrix)	3-D GRE: 1.5 (256 matrix)	3-D GRE: 1.6 (256 matrix)	3-D GRE: 1.93 (256 matrix)	1.4	1.4
Minimum Echo Time, (3-D T1 Spoiled Gradient Echo), msec	0.6	3-D FFE 0.34 (256 matrix)	3-D FFE 0.34 (256 matrix)	3-D GRE:0.22 ms (256 matrix)	3-D GRE: 0.22 (256 matrix)	3-D GRE: 0.63 (256 matrix)	3-D GRE: 0.66 (256 matrix)	3-D GRE: 0.82 (256 matrix)	0.4	0.4
FOV (AP, RL, HF, Min to Max), cm	50, 50, 50, 0.5 - 50	55 x 55 x 50 (0.05 - 55)	55 x 55 x 50 (0.05 - 55)	0.5 - 50	0.5 - 50	0.5 - 50	0.5 - 45	0.5 - 45	0.5 - 50	0.5 - 50
POWER REQUIREMENTS										
Voltage (Line Voltage, Phases)	460 / 480 3-phase	400 / 480 3-phase	400 / 480 3-phase	380 / 400 / 420 / 440 / 460 / 480 V, 3-phase + ground	380 / 400 / 420 / 440 / 460 / 480 V, 3-phase + ground	380 / 400 / 420 / 440 / 460 / 480 V, 3-phase + ground	380 / 400 / 420 / 440 / 460 / 480 V, 3-phase + ground	380 / 400 / 420 / 440 / 460 / 480 V, 3-phase + ground	200 V; 3-phase, 400 V, 3-phase	200 V; 3-phase, 400V , 3-phase
kVA	100	80	86	110	85	110	85	85	20, 42	20, 90
A/C, BTU / Hour (for Entire System)	63,438	N/A	N/A	</= 20,473	</= 20,473	</= 61,418	</= 34,121	</= 34,121	Approx. 92,000	Approx. 92,000

Scranton Gillette Communications obtained the model specifications from the manufacturers.

Hitachi Medical Systems

Hitachi Medical Corporation
Akihabara UDX, 4-14-1
Soto-Kanda
Chiyoda-ku
Tokyo, 101-0021, Japan
Phone +81 3 3526 8407 or 8408 (Intl. Division)
Fax +81 3 3526 8418

Hitachi Medical Systems America, Inc.
1959 Summit Commerce Park
Twinsburg, Ohio 44087, USA
Phone +1 330 425 1313
Fax +1 330 425 1410

Hitachi Medical Systems (Beijing) Corporation
Rm. 609-610 Winterless Center No. 1 West
Dawang Road
Chao Yang District, Beijing P.R.C., China
Phone +86 10 6538 8881
Fax +86 10 6538 8882

Hitachi Medical Systems (S) Pte Ltd
7 Tampines Grande Hitachi Square #04-01
Singapore 528736
Phone +65 6602 0110
Fax +65 6602 0111

Hitachi Medical Systems Middle East, Ltd
11 Sphinx Square, 10th Floor
Mohandeseen, Cairo, Egypt
Phone +20 2 3303 7165

Hitachi Medical Systems Europe Holding AG
Sumpfstrasse 13
CH-6300 Zug
Phone +41 41 748 63 33
Fax +41 41 748 63 32
Export Division
- Ultrasound
  Phone +41 41 748 63 47
  Fax +41 41 748 63 32
- MR/CT
  Phone +41 41 748 63 49
  Fax +41 41 748 63 32

www.hitachi-medical-systems.com

Hitachi Medical Systems GmbH
Technology Academy
Wanheimer Strasse 59
D-40472 Düsseldorf
Phone +49 211 1665 10
Fax +49 211 1665 169

Hitachi Medical Systems GmbH
Otto-von-Guericke-Ring 3
D-65205 Wiesbaden
Phone +49 6122 7036 0
Fax +49 6122 7036 10

Hitachi Medical Systems GesmbH
IZ NÖ-Süd, Strasse 2a, Objekt M39/II
A-2351 Wiener Neudorf
Phone +43 2236 677 750
Fax +43 2236 677 75049

Hitachi Medical Systems Kft.
Damjanich u. 11-15
Ligetváros Irodaház I. em. 102
H-1071 Budapest
Phone +36 1 478 0090
Fax +36 1 478 0091

Hitachi Medical Systems BV
Edisonstraat 1a
NL-2811 EM Reeuwijk
Phone +31 182 39 77 77
Fax +31 182 39 77 79

Hitachi Medical Systems N.V./S.A.
Mechelen Noord II
Wayenborgstraat 8
B-2800 Mechelen
Phone +32 15 20 22 55
Fax +32 15 20 01 92

Hitachi Medical Systems UK Ltd
5 Regent Park
Booth Drive
Wellingborough
Northamptonshire NN8 6GR UK
Phone +44 844 800 4294
Fax +44 1933 4058 59

Hitachi Medical Systems S.A.S.
18 avenue du Québec
BP 356
Villebon-sur-Yvette
F-91959 Courtaboeuf Cedex
Phone +33 1 69 86 12 34
Fax +33 1 69 86 18 82

Hitachi Medical Systems S.p.A.
Via Edison 6
I-20090 Assago MI
Phone +39 02 97166
Fax +39 02 97166127

Hitachi Medical Systems SLU.
Edif. Alfa III – Local 144
C/Isabel Colbrand 10-12
E-28050 Madrid
Phone +34 91 358 93 50
Fax +34 91 358 96 03

Plus representations in various European countries.

Hitachi Medical Corporation Medical System Operations Group, Kashiwa, is certified as complying with the International Standard of System Quality Assurance (ISO 9001), Medical Device Special Requirements (ISO 13485).

Hitachi Medical Corporation Medical System Operations Group, Kashiwa, has been certified to ISO 14001 (Environmental Management Systems).

Specifications and physical appearance may be changed without prior notice in order to improve performance. Some features described are optional. Please read instruction manual to ensure correct operation of the equipment.

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ECHELON OVAL | e | 10.2012 | a+w

OVAL ECHELON

The human shape

HITACHI
Inspire the Next

ECHELON OVAL
The human shape

ECHELON OVAL is designed around the shape of the human body, allowing for an optimal patient experience with outstanding comfort, space, and efficiency.
The game-changing 74cm oval bore is the widest 1.5T MR system available. Enhanced patient accessibility combined with Hitachi's Workflow Integrated Technology (WIT) and advanced imaging capabilities make ECHELON OVAL an ideal solution for improved workflow, greater diagnostic confidence, and increased cost-efficiencies.

Hitachi Medical Corporation Japan is an integrated medical systems manufacturer, owned by the Japanese Hitachi Ltd. Group, a leading international electronics company with a history of more than 100 years. Our broad experience and expertise in magnet, gradient and RF technology makes us a recognised leader in open MRI. We meet the latest in design and quality standards with truly comprehensive, patient-friendly systems that combine outstanding image quality with advanced clinical applications and unbeatable economical performance.

ECHELON OVAL – the innovation that changes the shape of MR

ECHELON OVAL features cost-effective, extremely accurate 1.5T diagnostic head-to-toe imaging capabilities in combination with exceptionally comfortable patient experiences for every stature.

WIT Monitor
Allows technologist to review and update patient information with ease

Wireless Gating
Fast and simple connection verified with WIT monitor

In Bore Lighting and Ventilation
Enhances patient experience

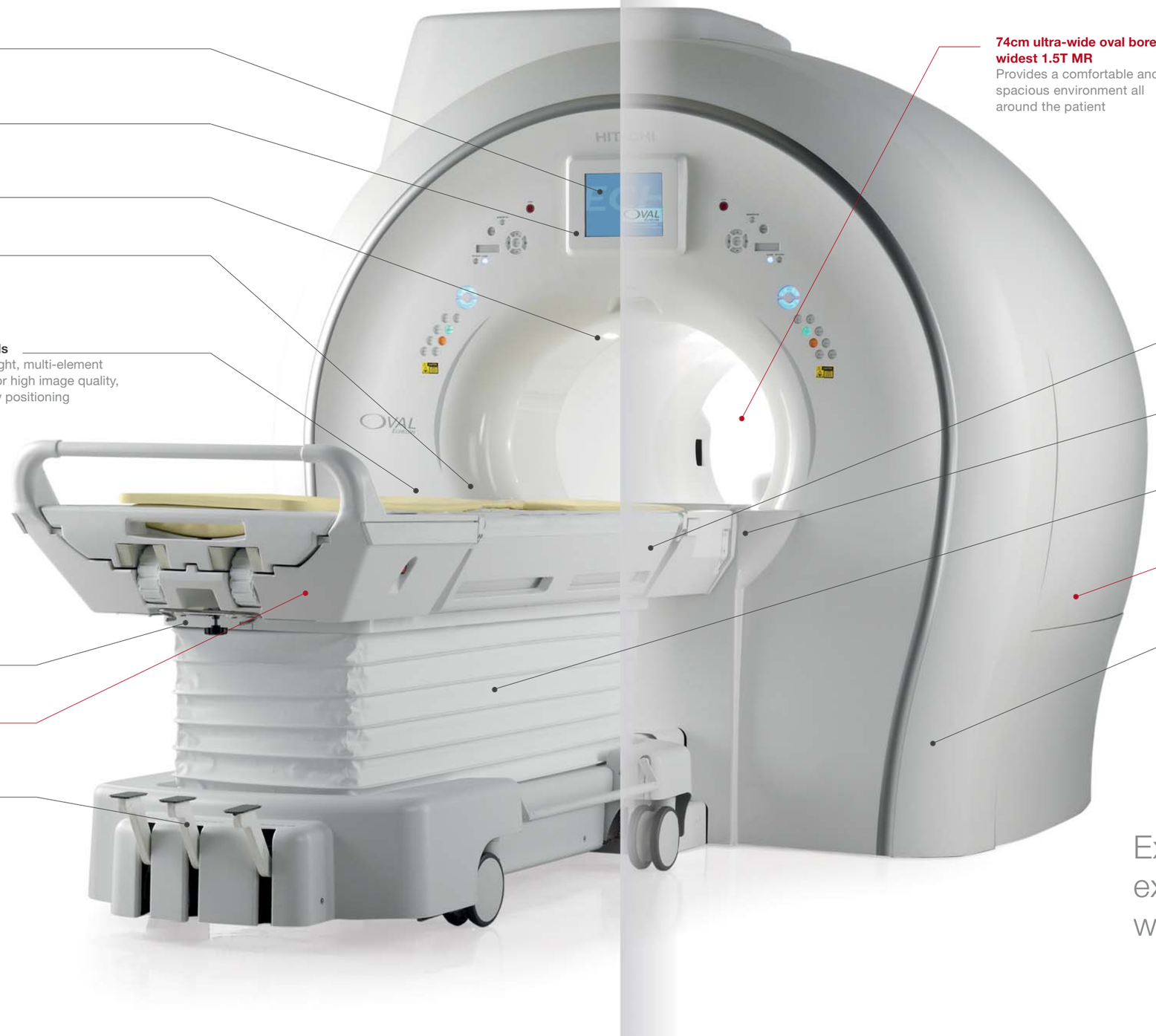
7 Coil Plug-in Ports
Supports head-first or feet-first positioning for all imaging

WIT Coils
Lightweight, multi-element design for high image quality, and easy positioning

IV Pole
Deploys effortlessly when needed

Widest 1.5T Patient Table (63cm)
Better patient accommodation and decreases anxiety for all patient types

3 Modes of Steering
Provides easy maneuverability and docking



74cm ultra-wide oval bore – widest 1.5T MR
Provides a comfortable and spacious environment all around the patient

3 Position Armboards
Provides patient comfort and safety

A/D Conversion at Gantry
Reduces signal loss and maximizes SNR

WIT Mobile Table
Minimizes moves for non-ambulatory and infirm patients

Oval Drive RF transmit
Independent control of RF transmit improves image uniformity

Optical RF Transmission
Reduces noise and maximizes SNR

Exceeding performance expectations and patient well-being.

ECHELON OVAL – shaped for you

This patient-focused 1.5T MR system features high homogeneity, ultimate stability and a full 50cm FOV in all directions. It includes High Order Active Shim Technology to assure exceptional magnetic field uniformity and offers a compact footprint with virtually zero helium boil off.

ECHELON OVAL – much more than a bore

- 1.5T Magnet with the game-changing 74cm oval bore
- Extra-wide 63cm mobile patient table with 250kg weight capacity
- HOSS – High Order Shim System
- PACT – Patient Active Comfort Technology
- 16-Channel RF system using optical technology
- WIT Integrated RF coil system
- High-output gradient system
- Vertex II computer system
- Origin MR operating system
- Clinical imaging suites
- Excellent image processing tools
- Designed for every possible human shape
- High throughput and profitability results

The ideal solution for patient accessibility, workflow and clinical capacity.

ECHELON OVAL – shaped for your patient

Hitachi has a long history of delivering patient-friendly systems that allow imaging practices to serve the broadest spectrum of patients. ECHELON OVAL carries on this Hitachi system tradition.

The 74cm oval bore is designed around the shape of the body, providing a comfortable and spacious environment for an optimal imaging experience. ECHELON OVAL is the widest 1.5T system available and delivers the most lateral freedom. Your anxious, claustrophobic, broad-shouldered, and bariatric patients will experience greater comfort and peace-of-mind. In turn, your imaging practice will decrease sedation costs, reduce rescans and improve throughput. The unique oval bore design produces winning results for both patient and hospital.

Every patient type will benefit from ECHELON OVAL's vast array of patient amenities.

- Critical Care – Patients can more easily be visually observed and monitored by personnel with the oval bore.
- Sports Medicine – More comfortable positioning options for extremity imaging. Lateral anatomy can be positioned closer to the iso-centre.
- Anxious – Feet-first positioning puts the patient at ease, while the oval bore means the patients have more room on the sides so they do not feel restricted.
- Oncology – The oval bore and wide patient table provide needed comfort, while the vertical table motion makes accessibility easy.

Geriatric
Table lowers to 50cm for easy accessibility for elderly or infirm patients.

Paediatric
Ample space allows for constant visual and physical contact with a loved one.

Bariatric
More space on the sides means larger patients are afforded greater comfort and accommodation.

Breast
Roomier where it matters most for greater comfort and less anxiety.

ECHELON OVAL – Workflow Efficiency with WIT shaping our lives

Hitachi is committed not only to patient comfort and outstanding clinical capabilities, but also to improving the overall performance of your imaging hospital. ECHELON OVAL meets this commitment through a comprehensive suite of features known as WIT, or Workflow Integrated Technology.

Hitachi's WIT system optimizes the entire imaging process. From patient setup and positioning through scanning and image processing, WIT delivers the highest level of patient comfort and operator productivity.

WIT Mobile Table

The WIT Mobile Table delivers outstanding benefits to both patient and hospital. Technologists can easily move the table to the patient rather than moving the patient to the table. This minimizes transfers for non-ambulatory and infirm patients. The table measures 63cm, providing comfort, capacity, and safety for large patients, and simplified patient positioning. The table mobility and extra width promote patient acclimation to alleviate anxiety. The large vertical range of motion provides easy patient accessibility, and the feet-first imaging capability further reduces patient anxiety.

The WIT Mobile Table provides a wide range of workflow and safety features.

Increase your overall performance.

WIT Monitor

The WIT Monitor is located at the top of the gantry, allowing the technologist to review and adjust patient information with ease and efficiency, without leaving the patient.
The operator can verify gating function right at the gantry. This is another way ECHELON OVAL improves workflow while decreasing patient anxiety.

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WIT Integrated RF Coil System

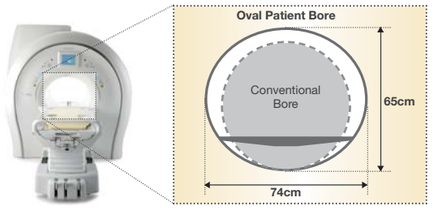
The WIT integrated coil system is a Hitachi technological advancement that improves all three elements of MR imaging: patient comfort, throughput, and clinical results. The integrated body/spine coil system resides within the table itself, delivering quick setup and optimized workflow. Anterior coils are immediately accessible, light-weight, and easy to position. And intelligent element selection chooses optimum coil elements, which not only aids in improving workflow, but also works to consistently produce the best image quality.
The signal from the coils is digitized (A/D conversion) right at the gantry to prevent signal loss, and is digitally transmitted via fiber optics to minimize noise. The result is the highest possible SNR.

Technologists can easily change WIT coils' position for head-first or feet-first positioning.

Wide-Bore MRI with Uncompromised Image Quality

Wide-Bore MRI can suffer from the inflexibility of the laws of physics. In simple terms, a bigger bore means poorer magnetic field homogeneity. Not a particularly desirable trade-off.

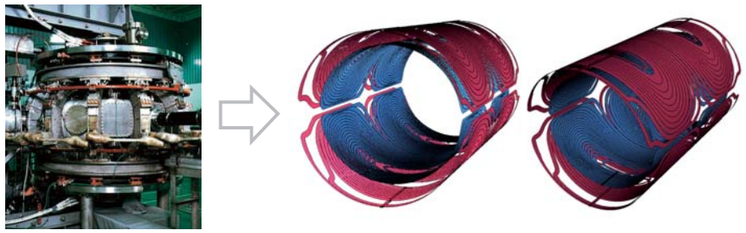
The inspired engineers at Hitachi, drawing on their extensive experience in the field of nuclear fusion technology and magnetic field simulation, chose to take a different path. Instead of increasing the bare magnet bore they changed the size and shape of the gradient coils and the RF coil that have to be positioned inside the bare bore. The Oval Drive gradient and RF coils are both extremely thin as well as being oval in cross-section resulting in a human-shaped patient aperture with an industry-leading 74cm wide bore that does not compromise magnetic field homogeneity.



Narrow-Bore Image Quality and Field of View with the widest Wide-Bore patient aperture.

Oval Drive GC

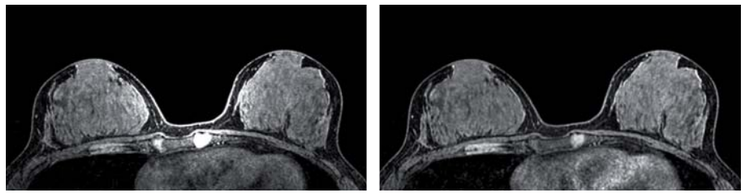
In combination with technologies to control the magnetic field precisely, the Oval Drive GC produces a very powerful and uniform magnetic field.



Nuclear fusion system technology from Hitachi.

Hitachi's gradient coil development is nurtured by the nuclear fusion know-how.

Oval Drive RF – delivering high homogeneity for reliable diagnoses



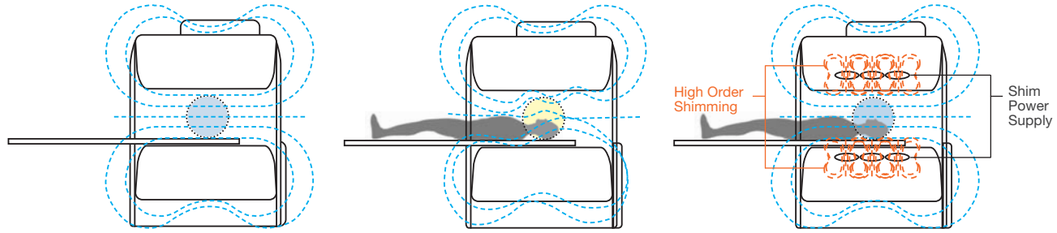
Conventional method.

Hitachi method resulting in improved B1 uniformity (RF transmission uniformity shown on the example of breast imaging).

Oval Drive RF incorporates two independent high power RF amplifiers, each of them enabling individual phase and power control for excellent RF transmission uniformity. This Oval Drive RF transmission system represents an important feature for the attainability of superb image quality in combination with excellent fat suppression techniques.

HOSS (High Order Shim System) – outstanding homogeneity in multifold clinical situations

Uniform RF saturation and large FOV capabilities are critical in diagnostic imaging. Hitachi's HOSS delivers uniform static magnetic field in any application and maximizes image quality to provide you high diagnostic confidence.



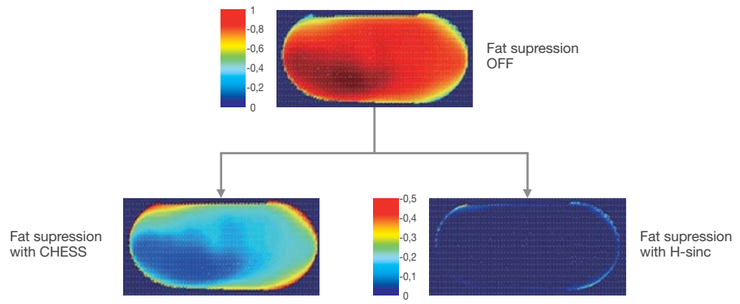
In a uniform (homogeneous) magnetic field, fat and water peaks have a constant frequency separation.

Without **HOSS**, the patient's body makes the magnetic field non-uniform, making fat saturation inconsistent.

With **HOSS**, the effect of the patient's body is reduced, promoting consistant fat saturation even across large FOV's.

H-sinc – revolutionary fat suppression technology that mitigates B1 non-uniformity

Fat suppression is critical for accurate MR diagnoses. To obtain sufficient effect of fat suppression, the homogeneity of the magnetic field and the uniformity of RF transmission are essential. With Hitachi's unique fat suppression technology "H-sinc", very effective fat suppression is performed free of B1 non-conformity for improved image quality. Moreover, the technology can be applied to a wide variety of sequences and CE scans and ensures highly uniform RF fat saturation for confident diagnoses.



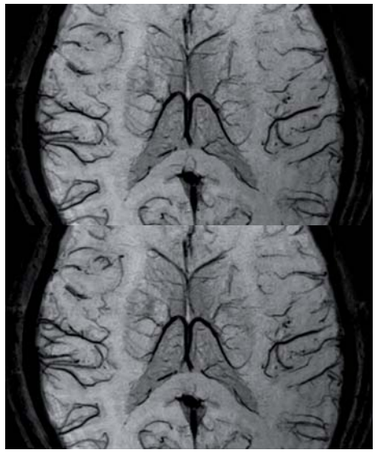
Comparison of Fat suppression effects.

ECHELON OVAL – diagnosis in perfect shape

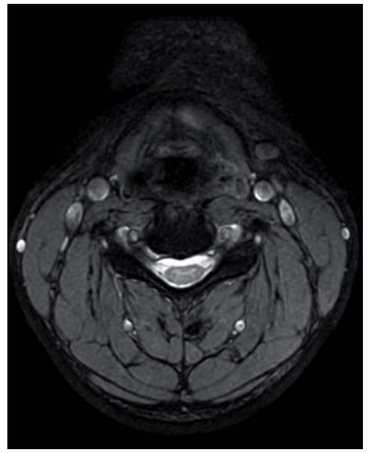
ECHELON OVAL features a 1.5T imaging system that delivers the full spectrum of clinical capabilities, acquisition features, and post processing tools providing high quality, high-field whole-body imaging.

Neuro Imaging

The powerful gradient system, sensitive RF coils, and comprehensive imaging features drive short scan times and high resolution for brain, head/neck, and spine imaging.

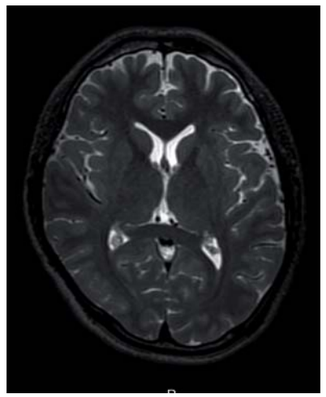


Using EPI based technique, BSI (Blood Sensitive Imaging) depicts micro-bleeds and medullary vein much faster than conventional techniques.



ADAGE (ADditive Arrangement Gradient Echo) helps observe spinal nervous system with high CNR typical of MRI among imaging modalities.

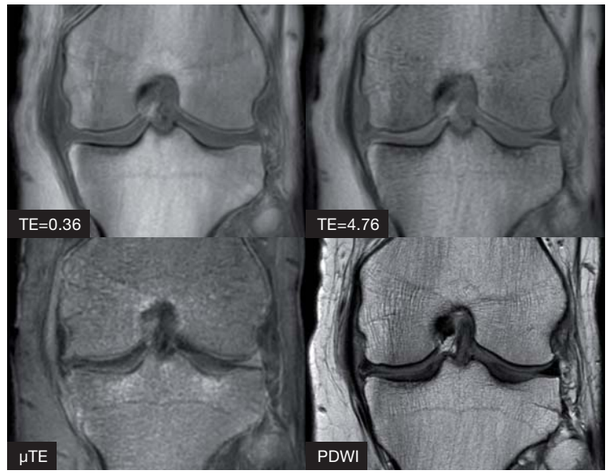
IsoFSE provides optimized T2WI, FLAIR and PD contrast for the entire volume with high spatial, isotropic resolution.



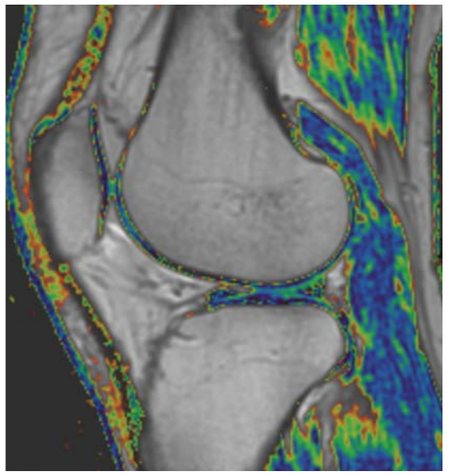
From a single acquisition any view, plane or slice can be reconstructed with the same high resolution as the native plane.

Orthopaedic Imaging

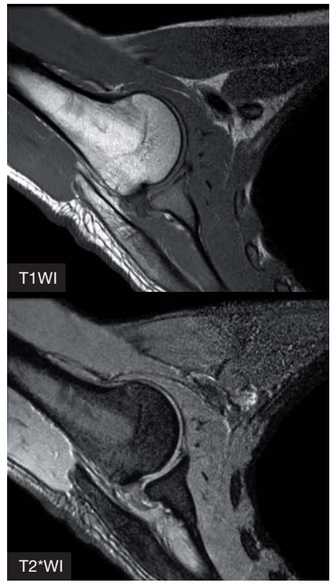
Highly sensitive multi-channel coils promote high spatial resolution critical for orthopedic imaging, and the HOSS with Regional Shim feature for off-isocenter imaging delivers remarkable RF fat saturation.



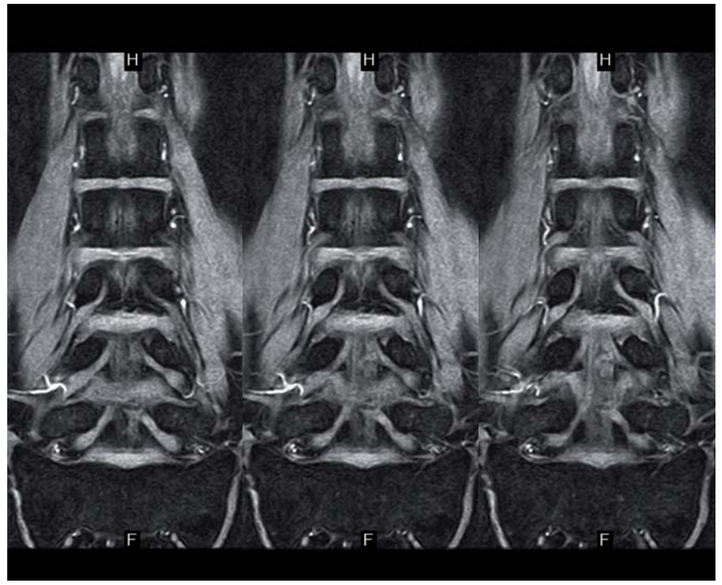
Depiction of collateral ligament by μTE. Micro TE is used to analyze cortical bone, tendon, and ligament using 2D radial gradient echo to provide high contrast imaging of tissue with very short T2 values.



T2 RelaxMap provides quantitative imaging for cartilage assessment with actual T2 values displayed in a color overlay within a morphological image which can depict subtle tissue properties and anomalies.



Clear depiction of the shoulder joint in ABER position possible thanks to oval shape of the gantry.

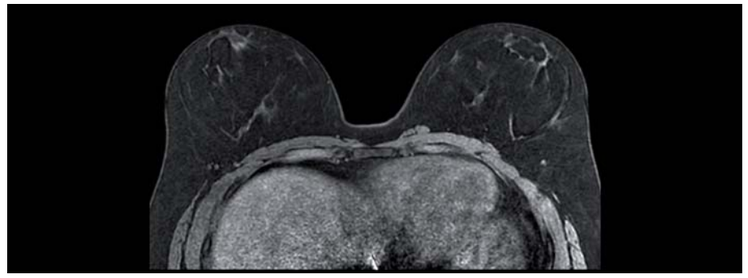


Combined use of ADAGE (ADditive Arrangement Gradient Echo) and fat-suppression by WE (Water Excitation). Increased contrast of spinal fluid helps show nerve roots clearly.

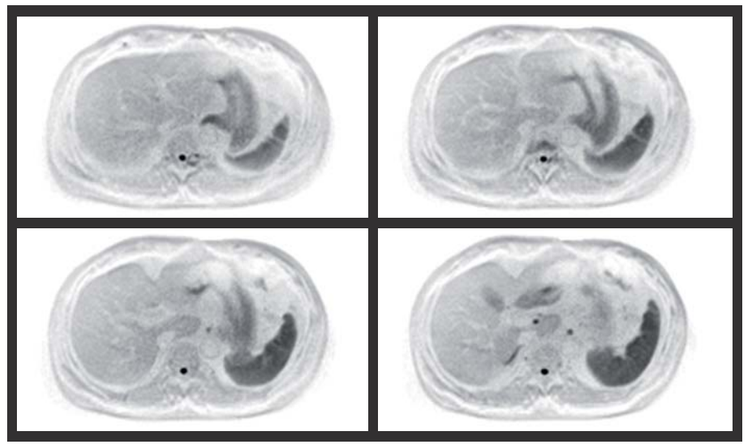
Body and Breast Imaging

High SNR from the highly sensitive WIT coil technology is complemented by the fast, fat suppressed imaging sequences and Hitachi's all coil/all plane motion compensating RADAR technique. Hitachi's standard and user-customized 2D and 3D protocols for abdomen, pelvis, MRCP, and dynamic liver and breast imaging are ready for your Body MRI challenges.

TIGRE (T1 weighted GRadient Echo nature of the sequence) and TIGRE C provide for dynamic liver and breast Imaging using 3D T1W GE with segmented RF fat saturation and RAPID parallel imaging.



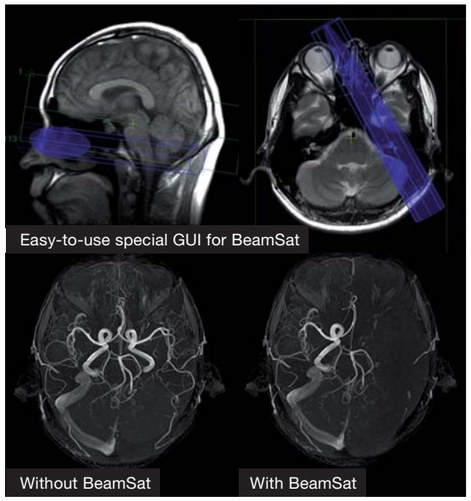
Abdominal Diffusion Weighted Imaging (DWI) with user selectable b-value for enhanced lesion detection.



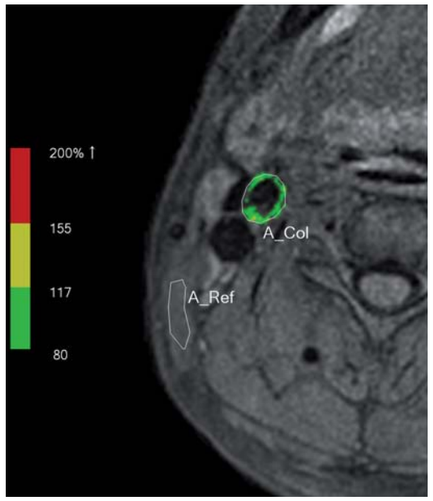
FatSep (Water Fat Separation) provides high SNR fat suppressed imaging with in phase and out of phase images in one sequence. FatSep can reduce the metal artifact than the other fat suppression technique.

Vascular Imaging

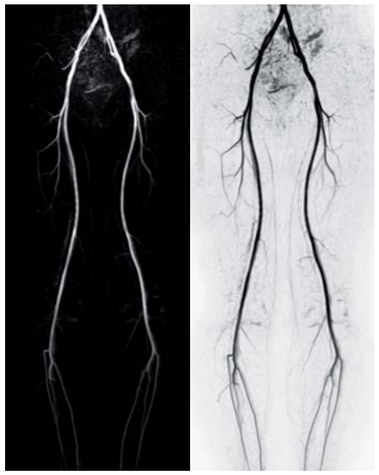
Contrast Enhanced Angiography techniques like Fluoro Triggered MRA (FLUTE) and Time Resolved MRA (TRAQ) complemented by the whole family of non-contrast angiography from conventional 2D and 3D TOF and PC to VASC-ASL (Veins and Arteries Scans Contrast – Arterial Spine Labeling) and VASC-FSE (Veins and Arteries Scans Contrast – Fast Spine Echo) provide the tools for Head-to-Toe vascular imaging. Advanced and unique Hitachi techniques such as BeamSat TOF and SIR Map enable analysies of artery stenosis and qualitative assessment of plaque allowing full diagnosis in vascular imaging.



BeamSat TOF allows users to selectively isolate flow signal with a cylindrical beam saturation pulse, which can localize sources of blood flow when depicting vascular anomalies.



SIR Map (Signal Intensity Ratio Map) used with RADAR T1WI SE sequence to evaluate the components of arterial plaque and therefore influence diagnosis and treatment monitoring of stenosis. The result is displayed as a color overlay on the anatomic image.



VASC-FSE non contrast alternative technique for peripheral vessel depiction.

VASC-ASL non contrast MRA used in cases of renal insufficiency employing Hitachi's VASC sequence and netting excellent renal vessel image quality without a bolus.

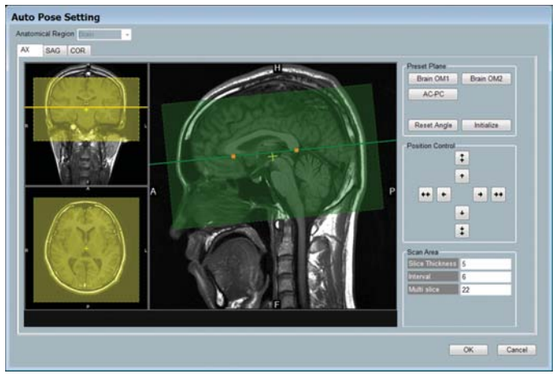
ECHELON OVAL – shape your workflow

ECHELON OVAL offers significant bottom line benefits through optimized workflow and increased throughput.

ORIGIN MR Operating Software with AutoPose

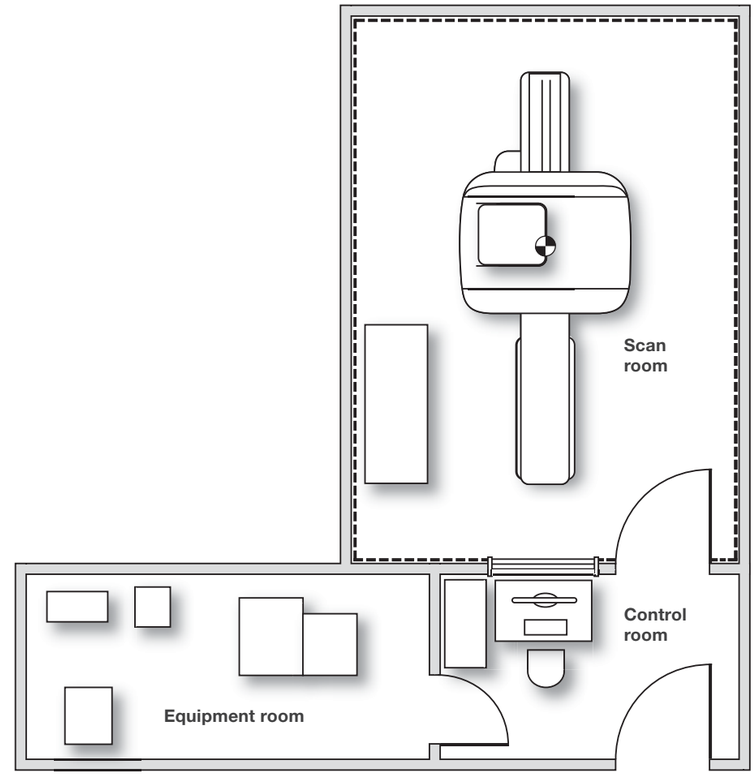
Origin MR Operating Software optimizes every facet of imaging workflow with features including simultaneous scan/recon, ultra-fast acquisitions, motion compensation techniques, scan parameter guidance, interoperability, and specifically AutoPose.
AutoPose moves workflow forward by automatically determining and placing optimal scan slice locations based on the initial scanogram, saving the operator time and improving consistency of routine brain scans.

AutoPose saves time and provides consistent results.



ECHELON OVAL – cost-effective siting for shaping your figures

ECHELON OVAL continues the Hitachi tradition of advancing MR systems beyond the technology you expect with cost-effective siting and operation. ECHELON OVAL's remarkable design attributes make it accommodating to existing facilities and easily planned into new construction. As an acknowledged leader in imaging installations, Hitachi offers a wealth of site planning experience and a proven system for efficient siting, installation, and start-up.



A remarkable design easily fitting into existing facilities and new constructions.

ECHELON OVAL
The human shape

HITACHI
Inspire the Next

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The **New Shape** of MR

Echelon Oval is designed around the shape of the human body, allowing for an optimal patient experience with outstanding comfort, space, and efficiency.

The game-changing 74 cm oval bore is the widest 1.5T MR system available. Enhanced patient accessibility combined with Hitachi's Workflow Integrated Technology (WIT), advanced imaging capabilities, and UltraPlus Customer Support, makes Echelon Oval an ideal solution for improved workflow, greater diagnostic confidence, and increased cost-efficiencies.

Echelon Oval, the innovation that's changing the shape of MR.

Patient Accessibility

Every Patient. Every Time.

Echelon Oval is designed to give patients a comfortable and spacious environment for an optimal imaging experience. The 74cm oval bore can accommodate a range of patients including broad-shouldered athletes, bariatric, pediatric, and geriatric.

Echelon Oval provides a greater sense of comfort and freedom. Claustrophobic or anxious patients benefit from increased space and visibility that provide a better sense of security. And for patients of all types, the extra space makes precise patient positioning that much easier.

All these benefits mean fewer patients turned away, significant reduction in rescans, less sedation and quicker, stress-free scanning for both patient and clinical staff.

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Advanced Clinical Capabilities

Head-to-Toe Imaging.

Echelon Oval features high quality imaging for the full spectrum of clinical needs. Advanced features include a diverse suite of non-contrast MRA capabilities for vascular imaging, a range of isotropic imaging techniques for neuro imaging, robust fat suppression techniques, cartilage mapping capability for orthopedic imaging, dynamic scanning and DWI for breast and body imaging. These features provide high diagnostic confidence, even for the most challenging cases.

All of this and Hitachi's RADAR motion compensation capability—applicable on all coils and in all body planes—plus pulse sequence flexibility, further ensure exquisite head-to-toe imaging.

Advanced clinical capabilities and comfort features designed with women's health, oncology, bariatric, and pediatric imaging in mind allow Echelon Oval to truly accommodate the broadest array of patients with superb image quality and exceptional comfort. Every patient, every time.

Workflow Integrated Technology

Efficiency and Comfort.

Hitachi's Workflow Integrated Technology (WIT) is a suite of efficiency-focused and patient-friendly features that optimize the entire imaging process, from patient preparation through scanning and image processing.

- **WIT RF Coil System:** Integrated coil system with optical RF transmission optimizes workflow and image quality while improving patient comfort.
- **WIT Monitor:** Allows the technologist to review and monitor patient information right at the gantry, with ease and efficiency.
- **WIT Mobile Table:** Features an extra-wide table (63cm) to increase accessibility and comfort for patients of all sizes and conditions.

In today's competitive market, Echelon Oval provides imaging practices with greater revenue opportunities through greater patient accessibility, optimized workflow and increased throughput, and considerable cost-efficiencies, while delivering extremely accurate 1.5T diagnostic capabilities.

Hitachi's Echelon Oval is changing the shape of MR.

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Hitachi Medical Systems America, Inc.
1959 Summit Commerce Park
Twinsburg, Ohio 44087 USA
Tel: 330.425.1313 800.800.3106
Fax: 330.425.1410
www.hitachimed.com

Hitachi Medical Corporation
4-14-1 Akihabara UDX
Soto-Kanda, Chiyoda-ku
Tokyo, 101-0021 Japan
www.hitachi-medical.co.jp

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Echelon Oval, the innovation that's changing the shape of MR.

Accessibility, Workflow & **Clinical Capability**

74cm Oval Bore (Widest 1.5T MR)
Provides a comfortable and spacious environment around the patient

7 Coil Plug-in Ports
Supports head-first or feet-first positioning for all imaging

WIT Coils
Lightweight, multi-element design for high image quality, and easy positioning

IV Pole
Deploys effortlessly when needed

3 Modes of Steering
Provides easy maneuverability and docking

Widest 1.5T Patient Table (63cm)
Better patient accommodation and decreases anxiety for all patient types

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WIT Monitor
Allows technologist to review and update patient information with ease

Wireless Gating
Fast and simple connection verified with WIT monitor

In Bore Lighting and Ventilation
Enhances patient experience

Oval Drive RF Transmit
2 ch. 20 kw solid state transmitter

Optical RF Transmission
Reduces noise and maximizes SNR

A/D Conversion at Gantry
Reduces signal loss and maximizes SNR

WIT Mobile Table
Minimizes moves for non-ambulatory and infirm patients

3 Position Armboards
Provides patient comfort and safety

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Every Time.

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Roomier where it matters most for greater comfort and less anxiety.

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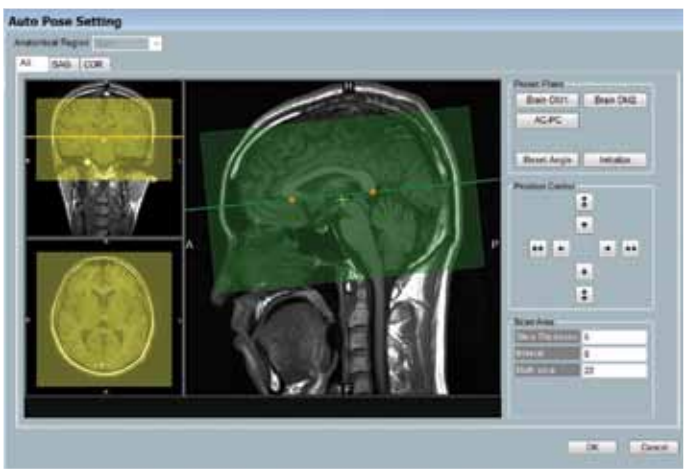

AutoPose saves time and provides consistent results.

Diagnostic **Confidence**

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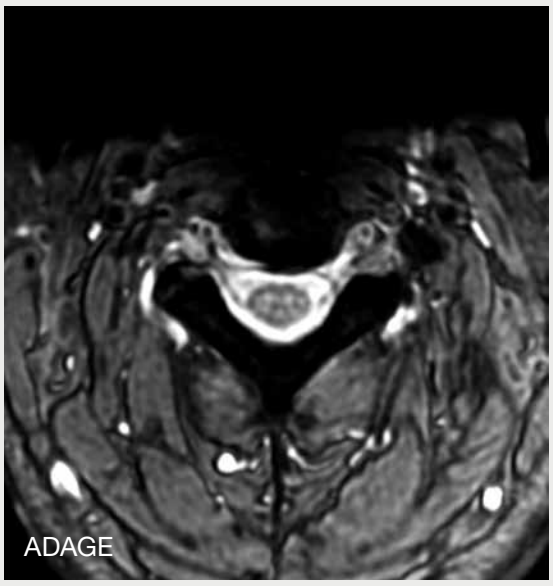
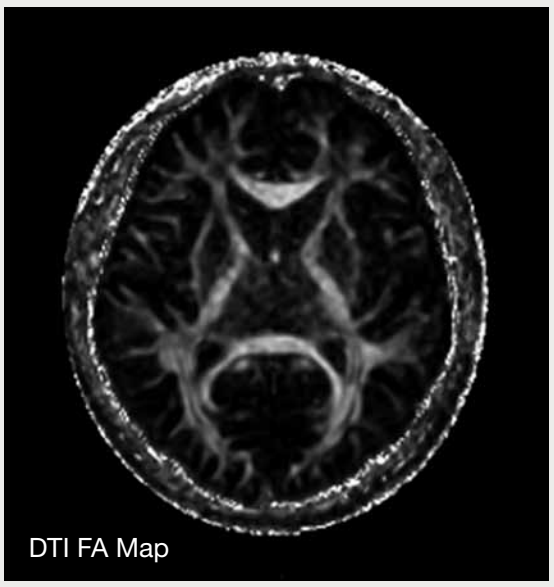

ADAGE


isoFSE


BSI (Blood Sensitive Imaging)


DTI FA Map

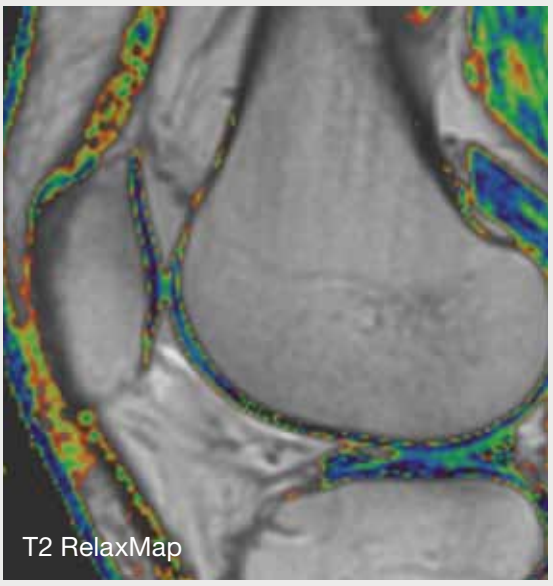
- ADAGE is designed for axial c-spine imaging with high gray/white matter contrast. It uses combinations of multiple echoes to create high contrast T2* for improved CNR/SNR.
- Isotropic Imaging with isoFSE and 3D-GEIR produces images that can be reconstructed in arbitrary planes using the MPR feature with excellent image quality.
- BSI (Blood Sensitive Imaging) depicts veins, hemorrhage, and micro bleeds without contrast using a 3D multi-shot Gradient Echo EPI sequence. It provides fast T2* weighted images that are sensitive to differences in magnetic susceptibility.
- Advanced neurological assessment is provided with DWI, DTI, Perfusion, and Spectroscopy.

OVAL
ECHELON

Orthopedic Imaging

Highly sensitive multi-channel coils promote high spatial resolution critical for orthopedic imaging, and the HOAST™ with Regional Shim feature for off-isocenter imaging delivers remarkable RF fat saturation.


FatSep


T2 RelaxMap

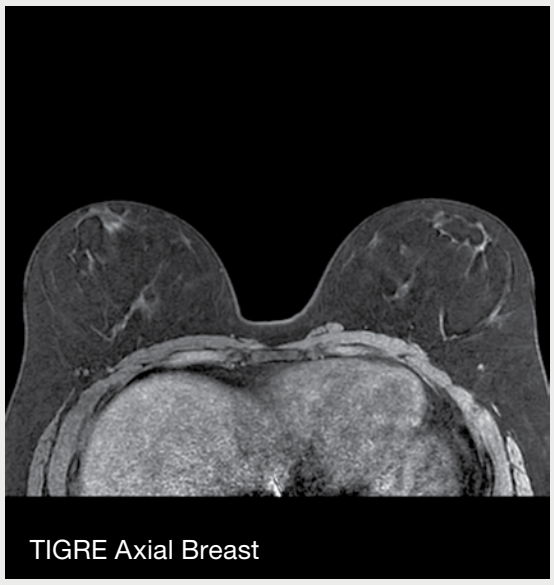

PD RF Fat Saturation


Micro TE

- Comprehensive uniform fat suppression is achieved with the choices of RF Fat Saturation (H-sinc and conventional pulses), FatSep and Water Excitation.
- Cartilage imaging excels using Water Excitation and BASG (Balanced SARGE) or RSSG (RF-Spoiled SARGE) 3D Gradient Echo sequences.
- T2 RelaxMap provides quantitative T2 imaging for cartilage assessment with quantification of actual T2 values within a morphological image. The T2 values are displayed in a color overlay which can depict subtle tissue properties and anomalies.
- Micro TE can be used to analyze cortical bone, surgical planning and for examining the interface of tendon, bone, and ligament using 2D multi-echo gradient echo to provide high contrast imaging of tissue with very short T2 values.

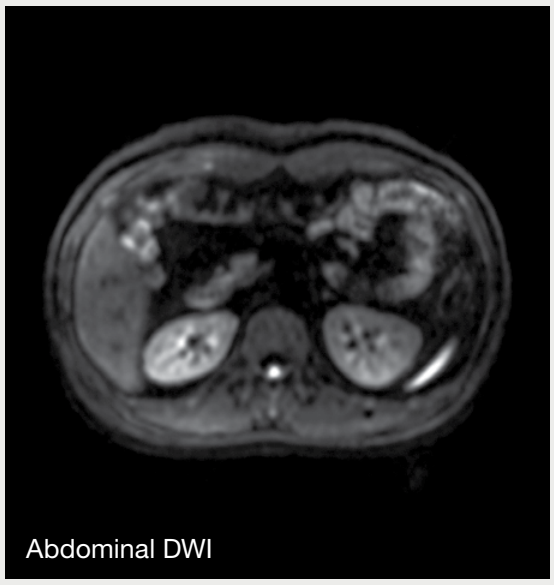
Body & Breast Imaging

High SNR from the highly sensitive WIT coil technology is complemented by the fast, fat suppressed imaging sequences and Hitachi's all coil/all plane motion compensating RADAR™ technique. Hitachi's standard and user-customized 2D and 3D protocols for abdomen, pelvis, MRCP, and dynamic liver and breast imaging are ready for your Body MRI challenges.



TIGRE Axial Breast

FatSep



Abdominal DWI

RADAR with RAPID T2 FSE

- TIGRE and TIGRE C provide for dynamic liver and breast imaging using 3D T1 gradient echo with RF fat saturation and RAPID parallel imaging.
- FatSep provides increased SNR and uniformity over large FOV imaging.
- Abdominal Diffusion Weighted Imaging (DWI) with user selectable b-valve for enhanced lesion detection.
- The combined benefits of RADAR with RAPID provide compensation for motion and maintain short scan times.

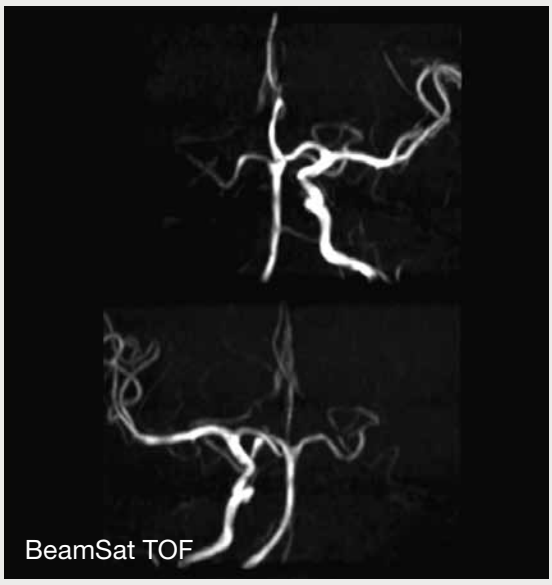
OVAL
ECHELON

Vascular Imaging

Conventional 2D and 3D TOF and advanced acquisition techniques such as Fluoro Triggered MRA (FLUTE™), VASC™ Non-Contrast MRA, and 3D vessel post-processing features provide the tools you need for Head-to-Toe vascular imaging.


VASC ASL


VASC FSE PVA


BeamSat TOF

SIR MAP

- VASC Non contrast MRA, including VASC ASL and VASC FSE is used in cases complicated by renal insufficiency, employing Hitachi's VASC sequence, and netting excellent renal and peripheral vessel image quality without a bolus.
- BeamSat TOF allows users to selectively isolate flow signal with a cylindrical beam saturation pulse, which can localize sources of blood flow when depicting vascular anomalies.
- SIR Map (Signal Intensity Ratio Map) is used with RADAR SE (T1 weighted motion compensation) to evaluate arterial plaque. The result is displayed as a color overlay on the anatomic image. SIR Map of diseased arteries can provide insight into the components of arterial plaque, and may have application in the diagnosis and treatment monitoring of carotid artery stenosis.

99% Uptime Backed by **100% Customer Commitment**

Hitachi's UltraPlus Customer Support Program delivers unmatched customer support that helps minimize the cost of ownership. From software upgrades to marketing support, from training to implementation, **Hitachi delivers comprehensive customer support at NO CHARGE, making a significant and tangible impact on bottom line financial performance.**

Hitachi's UltraPlus Customer Support Program

Value-Add	Annual Facility Expenditure*	Cost to You**
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Accreditation Support	$5,353	No Charge
Software Upgrades	$71,031	No Charge
Marketing Support	$11,302	No Charge
After Hours Service	$13,806	No Charge
TOTAL	**$111,246**	**$0**

*Estimated annual costs, can vary per customer
**For customers under warranty or covered by UltraPlus Customer Support Program

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Accessibility. Workflow. Clinical Capability.

In today's competitive market, Echelon Oval delivers 1.5T diagnostic capabilities with significant bottom line benefits through greater patient accessibility, tangible cost efficiencies, optimized workflow, and increased throughput. This is how **Hitachi's Echelon Oval is changing the shape of MR.**

Hitachi Medical Systems America, Inc.
1959 Summit Commerce Park
Twinsburg, Ohio 44087 USA
Tel: 330.425.1313 800.800.3106
Fax: 330.425.1410
www.hitachimed.com

Hitachi Medical Corporation
4-14-1 Akihabara UDX
Soto-Kanda, Chiyoda-ku
Tokyo, 101-0021 Japan
www.hitachi-medical.co.jp

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"The Hitachi Oasis has essentially made our Open MRI services limitless. Patients are able to tolerate its wide open design very well. The image quality is exceptional. Our radiologists have expressed that, in some cases, the image quality exceeds even that of our 1.5T conventional MRI system."

Sandra Holman
Administrative Director
Frye Regional Medical Center

"In the first seven months working with the scanner, we have seen a 19% incremental increase in patient volume. The OASIS now handles the bread-and-butter outpatient exams and it can also handle patients who are not candidates for either of the closed-bore 1.5T or 3T magnets at SLU Hospital."

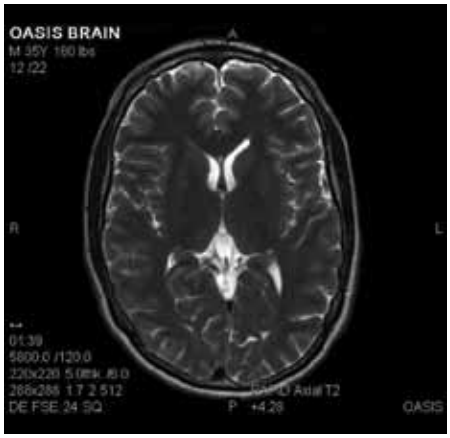
Jeffrey Dossett
Director of Imaging Services
St. Louis University Hospital

Contents

- RADAR minimizes motion and flow effects. Complete brain studies can be done with RADAR
- RAPID™ parallel imaging technique, enables short scan times
- High performance gradients drive fast, high resolution studies
- HOAST™ promotes fat saturation uniformity for small and large FOV
- Diffusion Weighted SS-EPI with seamless ADC map and isotropic DW image creation
- Zenith RF coils drive high resolution imaging with high SNR

Neuro - Brain

RADAR assures a diagnostic result even when there is extreme patient motion



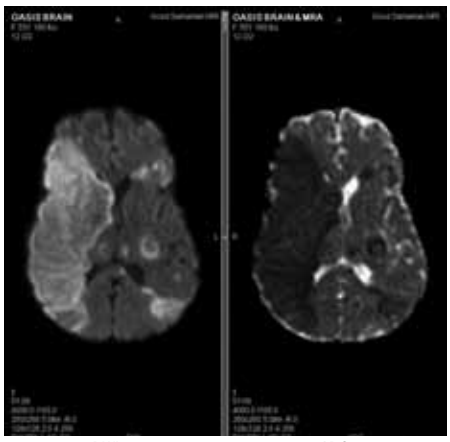
RAPID and Driven Equilibrium promote fast scans with high SNR

Resolution: <0.6mm
Slice: 1.0mm
Scan time: 3:40

Resolution: <1mm
Slice: 3.0mm
Scan time: 3:45

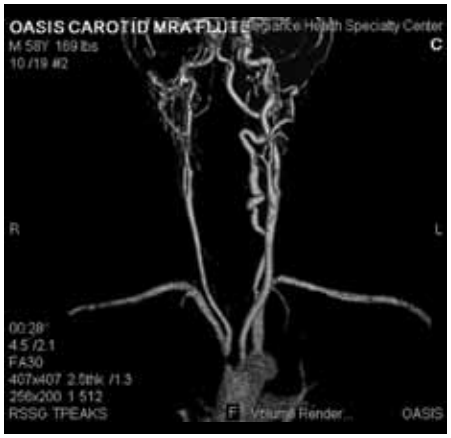
Thin slices and high resolution with short scan times

HOAST delivers excellent fat saturation



DWI ADC

RAPID reduces susceptibility artifacts on SS-EPI diffusion



Large field of view, high resolution and high signal uniformity with Oasis NeuroVascular Coil

- RADAR minimizes motion and flow effects. Complete spine studies can be done with RADAR
- RAPID parallel imaging technique enables short scan times
- High performance gradients drive fast, high resolution studies
- primeFSE reduces susceptibility artifacts from prostheses
- HOAST promotes fat saturation uniformity for small and large FOV
- BASG delivers excellent nerve root delineation
- Zenith RF coils drive high resolution imaging

Neuro - Spine

Spin Echo - T1W

T1 FLAIR

DE-FSE T2

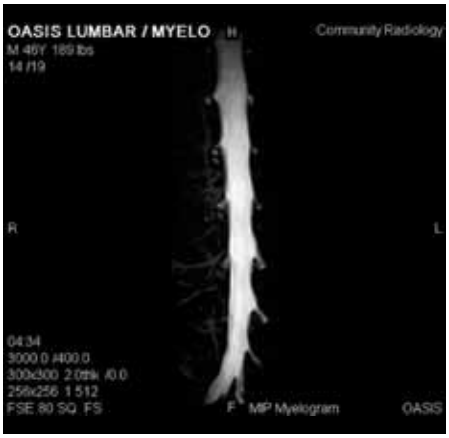
Complete study can be done using RADAR to minimize artifacts from voluntary or involuntary motion

Driven Equilibrium keeps scan time low for T2 weighting

Fast gradients deliver T1 weighting in a short scan time

HOAST promotes excellent large field of view fat sat saturation

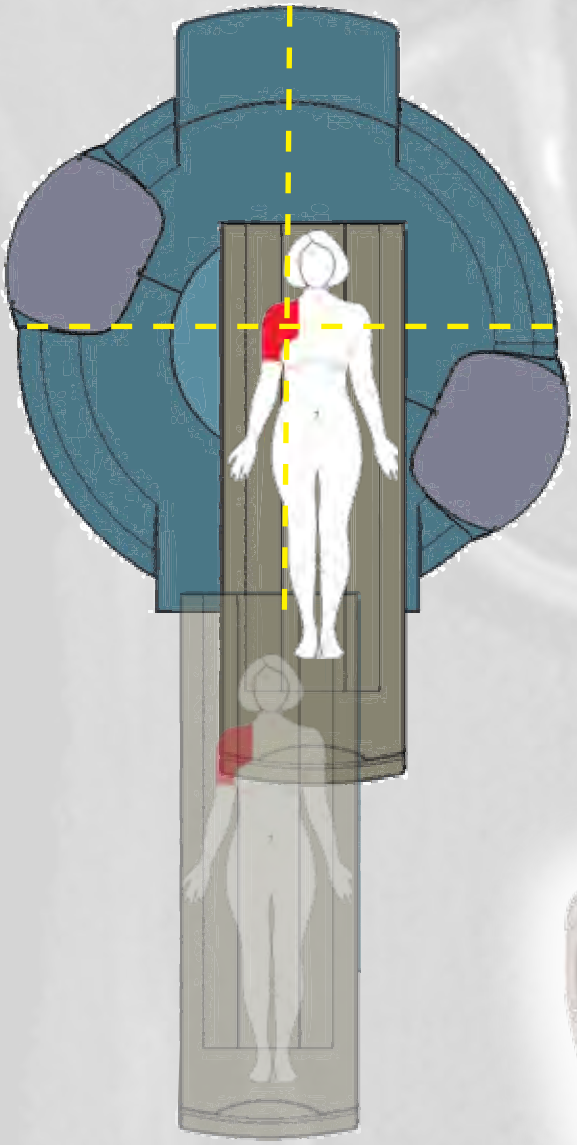
primeFSE minimizes susceptibility artifacts from prostheses



Myelogram at 400ms TE and 80ETL

Nerve root detail with BASG sequence

- Isocenter positioning enabled with lateral movement and wide patient table
- Dedicated RAPID orthopedic imaging coils for high SNR and signal uniformity
- HOAST and regional shimming deliver outstanding extremity RF fat saturation
- RADAR motion compensation
- Driven Equilibrium FSE enables heavy T2 weighting with fast scan time



MSK - Upper

Oasis' extra-wide patient table can move laterally to position anatomy of interest on iso-center. The result is high image quality with the patient maintaining a comfortable position.

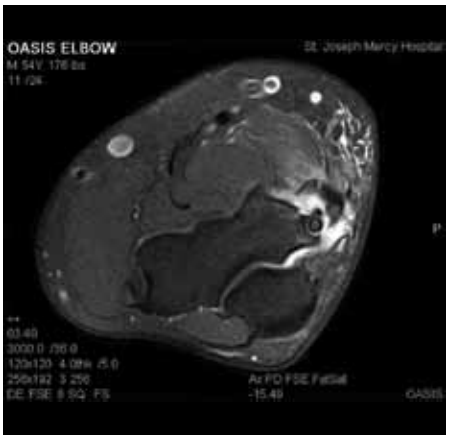
Scan time: 3:33
Resolution: <0.53mm

Scan time: 5:02
Resolution: <0.40mm

Scan time: 3:35
Resolution: <0.40mm

Oasis' powerful gradients promote high resolution imaging with fast scan times

Excellent cartilage depiction with RSSG or BASG and water excitation



Driven Equilibrium for PD weighting with fat saturation

- Isocenter positioning enabled with lateral movement and wide patient table
- Dedicated RAPID orthopedic imaging coils for high SNR and signal uniformity
- HOAST and regional shimming deliver outstanding extremity RF fat saturation
- Water Excitation with 3D Gradient Echo sequences for cartilage imaging
- primeFSE reduces susceptibility artifacts from prostheses
- RADAR motion compensation
- Driven Equilibrium FSE enables heavy T2 weighting with fast scan time

MSK - Lower

Oasis' extra-wide patient table can move laterally to position anatomy of interest on iso-center. The result is high image quality with the patient maintaining a comfortable position.

Oasis' powerful gradients promote high resolution imaging with fast scan times

primeFSE provides for imaging in the presence of prostheses

Excellent cartilage depiction with RSSG and water excitation

Driven Equilibrium fast IR (FIR) with fast scan time

- TIGRE™ fat suppressed 3D dynamic imaging for thin slice and complete organ coverage
- RAPID reduces breath hold and study times. RAPID 3D accelerates volume acquisitions for dynamic imaging
- RADAR for comprehensive free breathing abdominal series
- HOAST optimizes field uniformity for excellent image quality and fat suppression
- In-phase/out-of-phase results in one breath hold
- Large to small FOV capability promoted by sensitive RF Coils

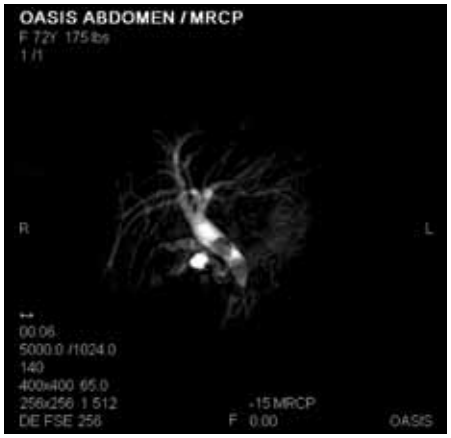
Pre

Post

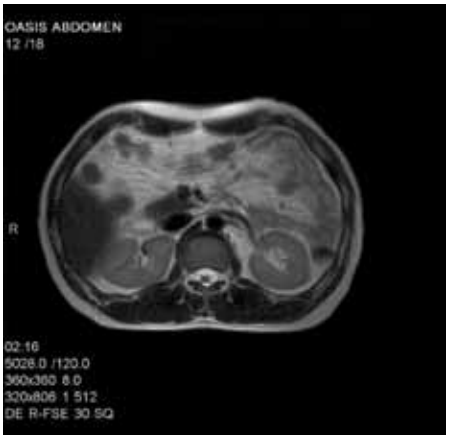
Post + 5 min.

TIGRE Gradient Echo Sequence for T1 weighting with fat saturation for dynamic liver maging. Fast, 18-second breath hold

Excellent uniformity over large fields of view



MRCP with heavy T2 weighting and MIP processing



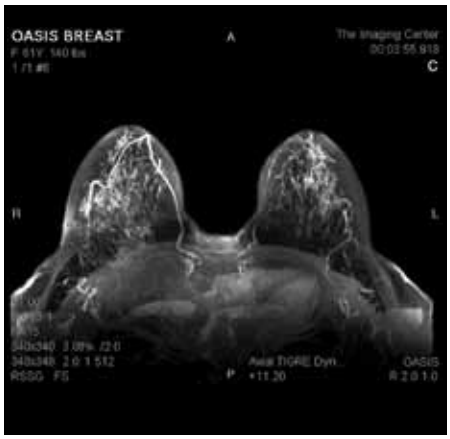
Free breathing kidneys with RADAR

Dual echo gradient echo provides in-phase and out-of-phase images in a single, 23-second breath hold

Excellent soft tissue depiction with water excitation

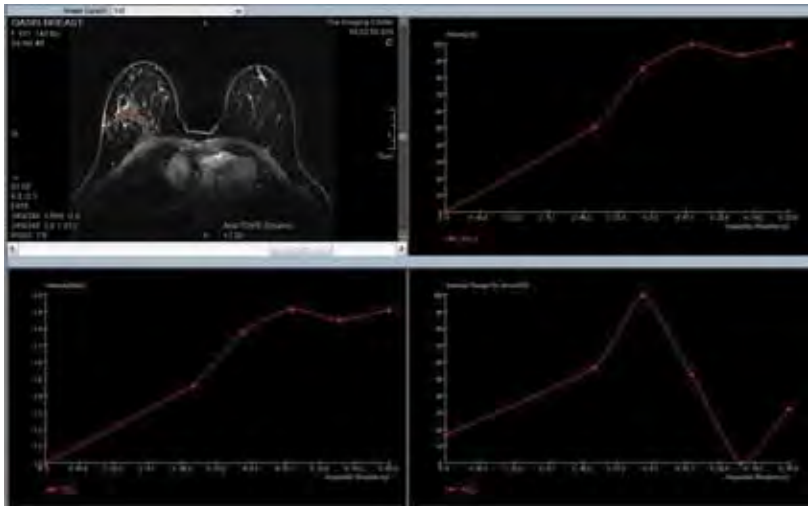
- TIGRE for dynamic studies meets ACR guidelines
- RAPID 3D further accelerates volume acquisitions
- Sensitive Breast RF Coil delivers bilateral, high SNR coverage and patient comfort
- Workflow-focused image processing
- Automatic position correction and subtraction
- DICOM exportable time/intensity curves
- Compatibility with CAD

Driven Equilibrium T2 Weighting



Maximum Intensity Projection

8-channel bi-lateral breast coil provides for high SNR and RAPID parallel imaging



Dynamic Tissue Intensity analysis. Images can be sent by DICOM to a separate CAD workstation

RADAR reduces motion artifacts

Uniform fat saturation with HOAST

High resolution pelvic imaging

Pre

Post

Post + 1 minute

Dynamic acquisition in full compliance with ACR Guidelines:

- Sub-millimeter in-plane resolution
- ‹3mm slice thickness
- Bilateral imaging
- Repeat series in 3 min or less (typically ‹90 sec)

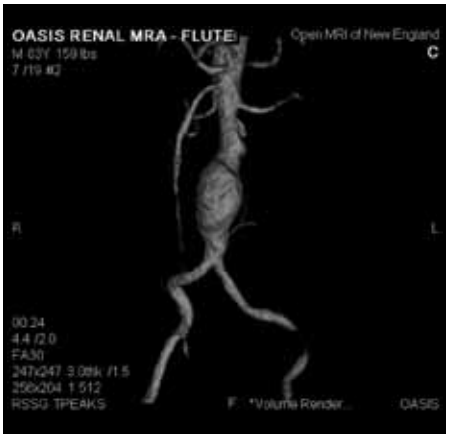
- 2D and 3D TOF for intra-cranial and extra-cranial imaging
- FLUTE™ ensures arterial phase capture
- TPEAKS™ centric k-space filling
- TRAQ MRA depicts blood flow dynamics
- PVA with multi-coil connections, auto table movement, and large FOV
- VASC™ non-contrast MRA for renal, carotid and peripheral applications
- Dedicated RF Coils provide outstanding coverage and uniformity
- Volume Rendering and auto MIP preview

Vascular

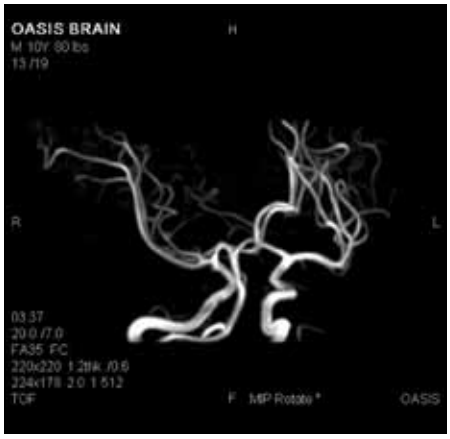
FLUTE, fluoro triggering, and TPEAKS ensure excellent depiction of the arterial phase

Auto Table Step enables multi-station runoff studies. Image stitching creates a single image for archive or export

VASC for high quality MRA without a contrast agent



Volume rendering helps visualize vascular abnormalities

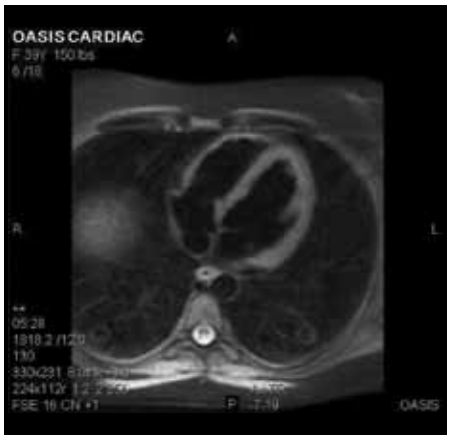


Sensitive Zenith RF coils provide for high SNR and uniformity and large field of view

Sensitive Zenith coils provide detail in lower vasculature

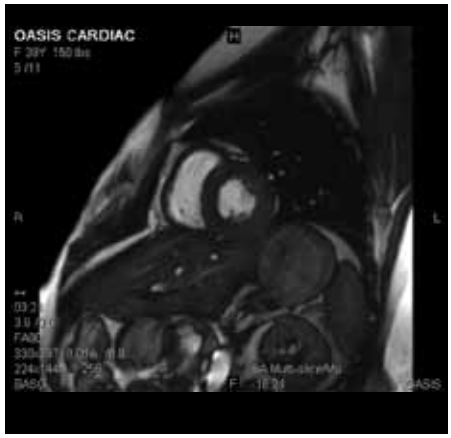
- Flexible, workflow-focused tools to assess cardiac morphology and function
- Double and triple inversion recovery breath hold acquisitions
- Navigator echo free-breathing scan
- RAPID parallel imaging increases temporal resolution and image quality
- Multi-slice, multi-phase cine
- Viability assessment benefits from powerful gradients and sensitive RF Coils

Double Inversion Recovery



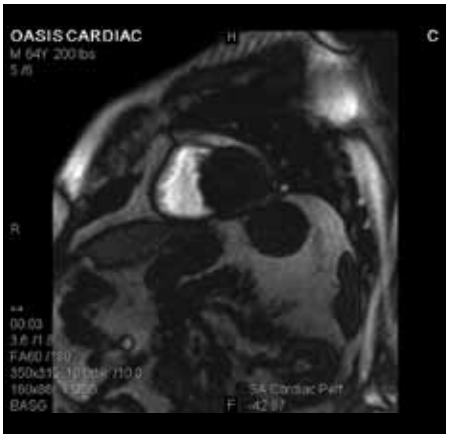
Triple Inversion Recovery

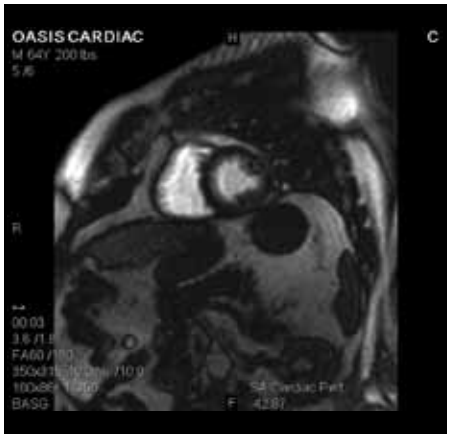
Free breathing navigator echo

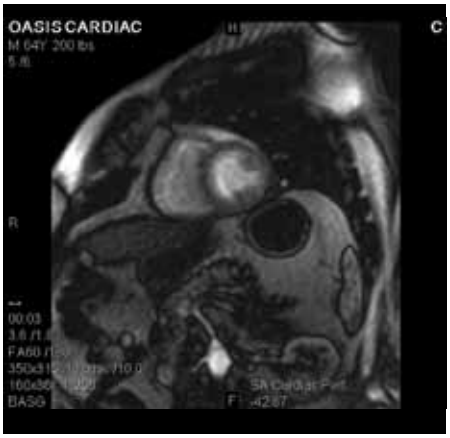


Multi-slice/multi-phase cine for functional assessment

Myocardium assessment with delayed enhancement



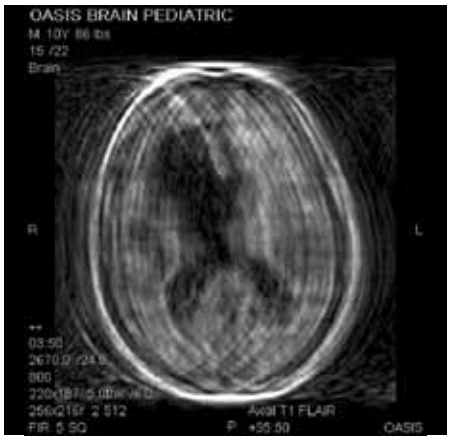


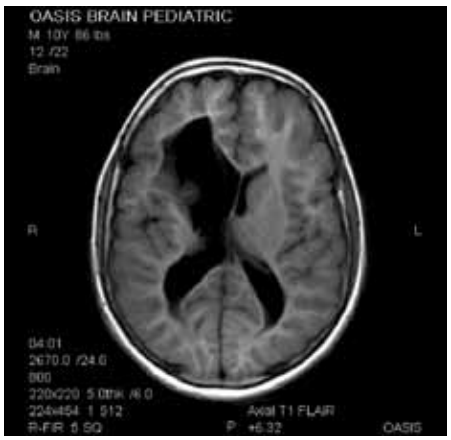


Viability assessment with dynamic tissue intensity

- Imaging free of ionizing radiation – a safer alternative for pediatric patients
- Constant parent-child contact dramatically improves patient compliance
- RADAR motion free imaging eliminates repeat scans and improves image quality
- Fast scanning techniques keep study time minimal
- Halo coil delivers quality imaging and an all-around view

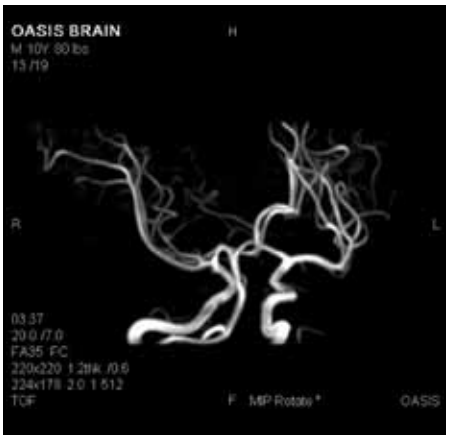
Pediatric

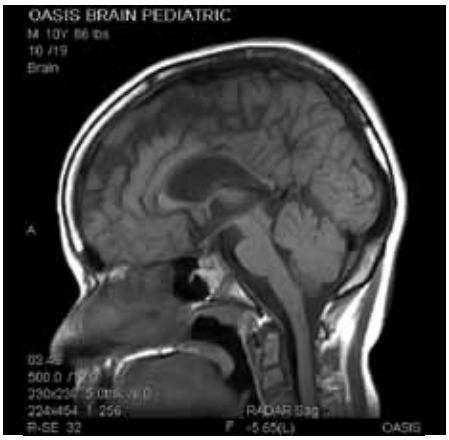




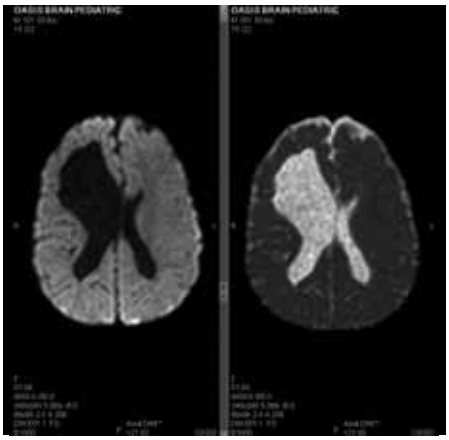
Oasis' RADAR feature delivers diagnostic results even with non-compliant patients

White matter suppression with primeFIR





High quality pediatric head imaging with the solenoid "halo" coil



Echo Planar sequence for DW weighting with ADC

FOV: 14cm
Resolution: <0.73mm

Small FOV – High resolution MSK imaging

Out of phase Gradient Echo

Aortic arch

High SNR Body Imaging

- Oasis' coil offerings accommodate larger patients while maintaining high SNR
- NATURAL™ provides signal intensity compensation necessary for larger patients
- Optimal image qualtiy with iso-center positioning for even the largest of patients
- 82 cm wide patient table with 660 lb. capacity
- Extra large flexible body coil for patients at the extreme of the demographic spectrum
- Integrated transmit/receive coil for good imaging results if no other coil is appropriate

NATURAL provides signal compensation necessary in spine studies for larger patients

Scan Time: 3:43

Driven Equilibrium combines with prime-FIR to keep scan time low

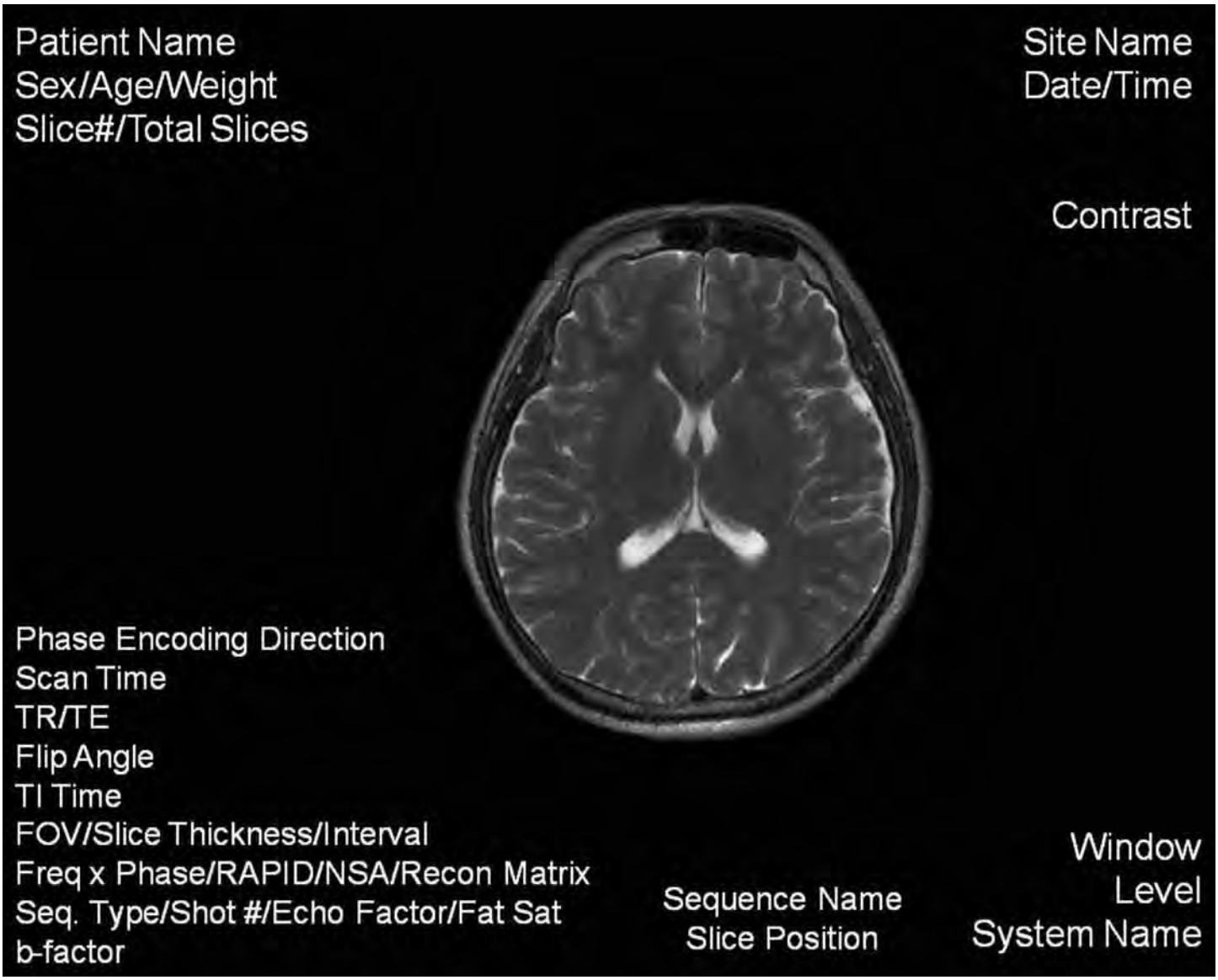
FOV: 40cm

High quality body imaging with the Extra Large flex body coil

MSK imaging of large patients is less challenging with Oasis due to the wide open design, large table and iso-center positioning

Image Annotation Guide

Locations and meaning of annotation text used with Oasis images



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Pediatric

Anxious

Open Access

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Hitachi Medical Systems America, Inc.
1959 Summit Commerce Park
Twinsburg, Ohio 44087 USA
Tel: 330.425.1313 800.800.3106
Fax: 330.425.1410
www.hitachimed.com

Hitachi Medical Corporation
4-14-1 Akihabara UDX
Soto-Kanda, Chiyoda-ku
Tokyo, 101-0021 Japan
www.hitachi-medical.co.jp

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Hitachi Medical Corporation
Akihabara UDX, 4-14-1
Soto-Kanda
Chiyoda-ku
Tokyo, 101-0021, Japan
Phone +81 3 3526 8410
Fax +81 3 3526 8409

Hitachi Medical Systems America, Inc.
1959 Summit Commerce Park
Twinsburg, Ohio 44087, USA
Phone +1 330 425 1313
Fax +1 330 425 1410

Hitachi Medical Systems (Beijing) Corporation
Rm. 609-610 Winterless Center No.1 West
Dawang Road
Chao Yang District, Beijing P.R.C., China
Phone +86 10 6538 8881
Fax +86 10 6538 8882

Hitachi Medical Systems (S) Pte Ltd
600 North Bridge Road #08-09/10
Parkview Square Singapore 188778, Singapore
Phone +65 6296 2202
Fax +65 6296 2242

www.hitachi-medical-systems.com

Hitachi Medical Systems Europe (Holding) AG
Sumpfstrasse 13
CH-6300 Zug
Phone +41 41 748 63 33
Fax +41 41 748 63 32
Export Division
- Ultrasound
  Phone +41 41 748 63 47
  Fax +41 41 748 63 32
- MR/CT
  Phone +41 41 748 63 49
  Fax +41 41 748 63 32

Hitachi Medical Systems GmbH
Technology Academy
Wanheimer Straße 59
D-40472 Düsseldorf
Phone +49 211 1665 10
Fax +49 211 1665 169

Hitachi Medical Systems GmbH
Kreuzberger Ring 66
D-65205 Wiesbaden
Phone +49 611 97322 0
Fax +49 611 97322 10

Hitachi Medical Systems GesmbH
Jakschgasse 5
A-1140 Wien
Phone +43 1 895 95 25 0
Fax +43 1 895 95 25 25

Hitachi Medical Systems Kft.
Damjanich u. 11-15
Ligetváros Irodaház I. em. 102
H-1071 Budapest
Phone +36 1 478 0090
Fax +36 1 478 0091

Hitachi Medical Systems BV
Edisonstraat 1a
NL-2811 EM Reeuwijk
Phone +31 182 39 77 77
Fax +31 182 39 77 79

Hitachi Medical Systems N.V./S.A.
Interleuvenlaan 21 bus 2
B-3001 Heverlee
Phone +32 16 40 95 11
Fax +32 16 40 95 12

Hitachi Medical Systems UK Ltd
5 Regent Park
Booth Drive
Wellingborough
Northamptonshire NN8 6GR UK
Phone +44 844 800 4294
Fax +44 1933 4058 59

Hitachi Medical Systems Sarl
1, avenue du Parana, B.P. 356
F-91959 Les Ulis
Phone +33 1 69 86 12 34
Fax +33 1 69 86 18 82

Hitachi Medical Systems S.L.
Edif. Alfa III – Local 144
C/Isabel Colbrand 10-12
E-28050 Madrid
Phone +34 91 358 93 50
Fax +34 91 358 96 03

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Hitachi Medical Corporation, Medical Systems Operating Group, is certified as complying with the International Standard of System Quality Assurance (ISO 9001), Medical Device Special Requirements (ISO 13485) and etc.

Hitachi Medical Corporation, Medical Systems Operating Group, has been certified to ISO 14001 (Environmental Management Systems).

Specifications and physical appearance may be changed without prior notice in order to improve performance. Some features described are optional. Please read instruction manual to ensure correct operation of the equipment.

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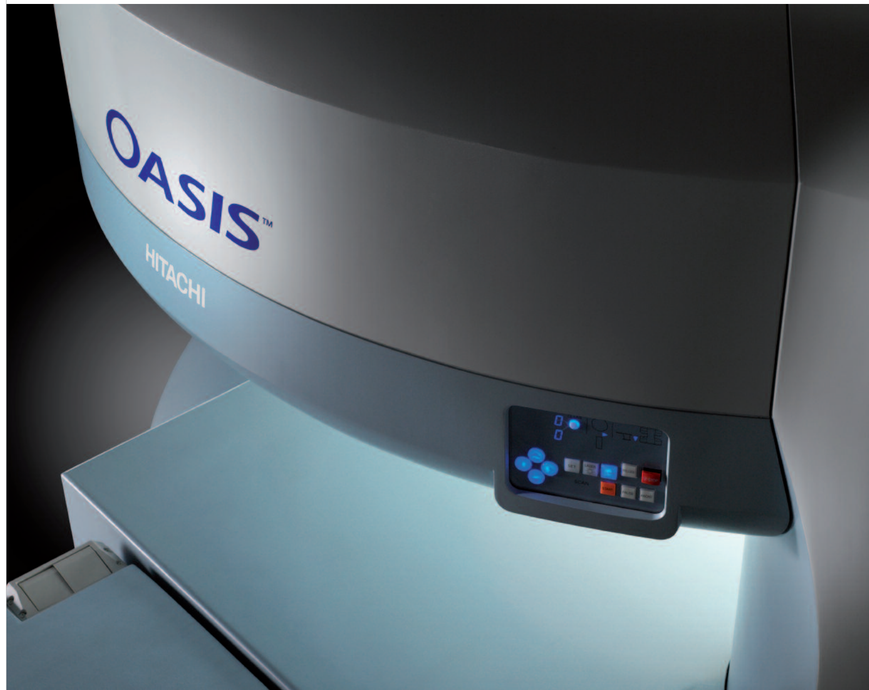
OASIS™

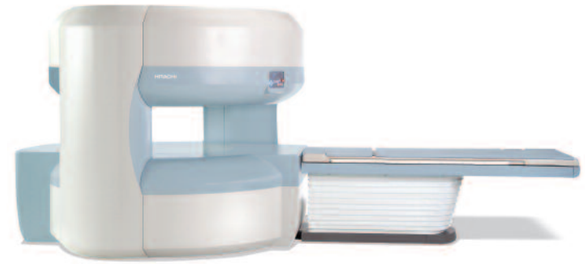
The ultimate Patient MRI - open



OASIS™

The ultimate Patient MRI - open

For both you and Hitachi, the patient comes first! Hitachi Medical Systems presents OASIS™, a genuinely open and vertical high-field MRI system that can be used for all patients and covers all of your application requirements.



Hitachi Medical Systems Europe is the European headquarters of the Hitachi Medical Corporation whose corporate head offices are located in Tokyo, Japan; a company renowned for technological innovation. Our broad experience and expertise in magnet, gradient and RF technology makes us a recognised leader in open MRI. We meet the latest in design and quality standards with truly comprehensive, patient-friendly systems that combines outstanding image quality with advanced clinical applications and unbeatable economical performance.

OASIS™ – Technology and Performance

OASIS™ combines high-speed gradients, multi-channel RF technology and unmatched Zenith RF coils with a genuinely open MRI system.

Hitachi Technology

This powerful 1.2T vertical field MRI system delivers outstanding image quality for all of your high-field applications. Its intuitive software makes the most demanding of protocols and applications easy to understand, navigate and use. OASIS™ also supports DICOM interaction, IHE and the security features that are required to operate in a dynamic medical imaging environment. Moreover, peripheral devices can also easily be integrated into the system.

Hitachi Design

OASIS™ demonstrates Hitachi's unique and extensive experience in the design of patient-centric MRI systems. The 270° patient view, large vertical gap, asymmetric table alignment and high-capacity table provide the most comfortable scanning environment, regardless of the patient's body type.

Hitachi Image Quality

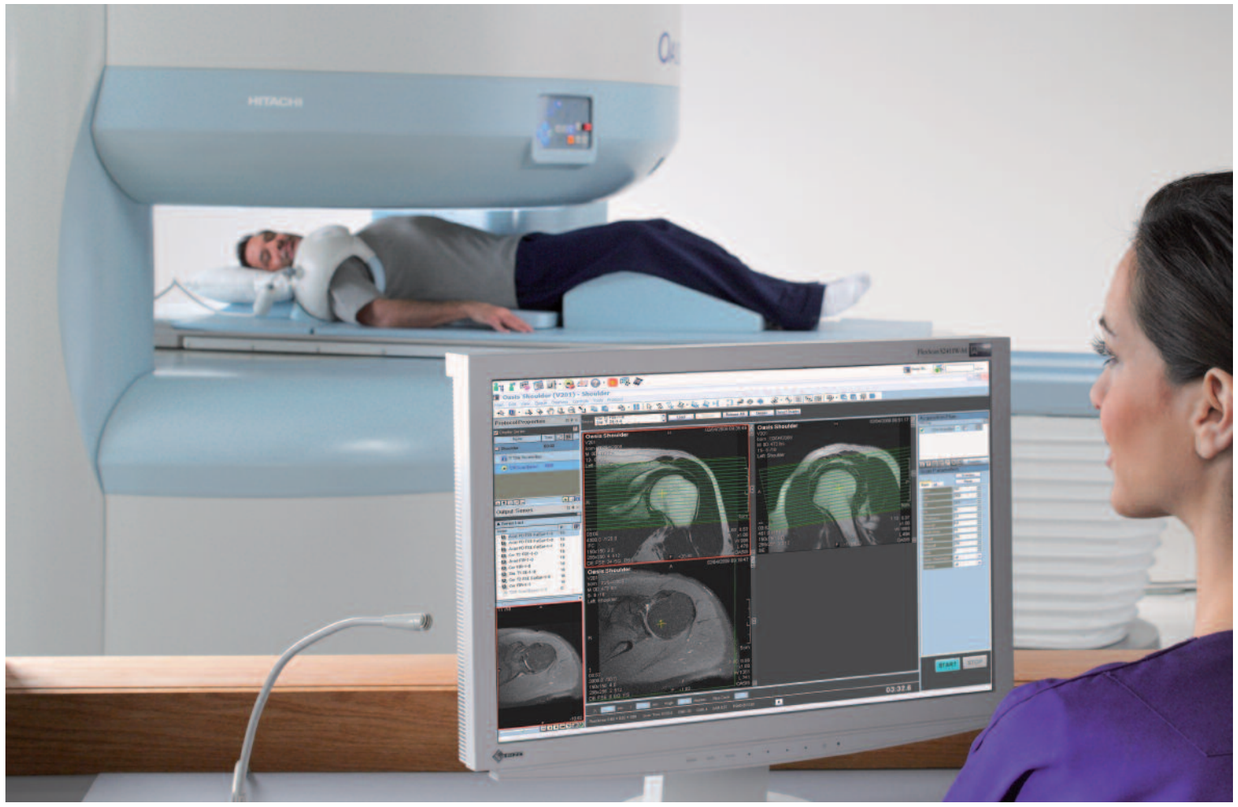
The clinical demand for high-level imaging on your schedule can be met by the OASIS™ range of diagnostic applications, all of which ensure the highest image quality in all clinical aspects.

Hitachi Economy

OASIS™ achieves reliability for the administrator. The scan control and reconstruction engine allow efficient acquisition management. Rapid image reconstruction, smooth workflow and high patient throughput are assured. The outstanding design and technology facilitate installation in room spaces equivalent to those used for 1.5T horizontal closed bore systems, thus making siting economical.

Hitachi Uptime

With more than 5000 installations of "Open MRI" worldwide, and over 20 years leading the development of open MRI technology, our highly valued customers rely on our excellent product reliability and services each and every day, with the number of highly satisfied customers rising year by year. How can we help you?



OASIS™ – Open Architecture Superconductive Imaging System

OASIS™ – open architecture superconductive imaging system. Cutting-edge technology combined with patient-centric product design leads to both better diagnosis and higher productivity.

OASIS offers:

- **Highest field strength, 1.2T open design**
  delivers outstanding image quality, comparable to that of a 1.5T high-end horizontal bore system
- **Cost-effective siting**
  fits in almost all conventional 1.5T rooms
- **HOSS™ (High Order Shim System)**
  provides excellent magnet homogeneity for the best image quality and the highest patient throughput
- **Excellent image quality and RF fat saturation**
  to meet your diagnostic clinical needs
- **Unique zenith coil technology**
  20 years of experience in vertical magnetic field coil technology, with the highest number of channels in open MRI, enabling parallel imaging
- **Unique open view and patient comfort level**
  for all your patients, ensuring high patient throughput
- **Widening access by patient groups**
  ensures access to those previously unsuited or prevented from accessing horizontal bore systems

OASIS™ – genuine patient-centric design

OASIS™ provides vertical high–field, superconductive open MRI – clinical advancement developed with the patient's experience in mind, as patients at their ease produce the best image quality.

HOSS™
High Order Shim System

Compensates for the effect of the patient's body on the main magnetic field. Regional shim allows the most convenient positioning for both patient and user, giving outstanding imaging results. HOSS™ technology is the hardware platform of the future, opening up even more advanced imaging capabilities.

The clinical benefits include:

- Excellent image quality for all sequences
- Outstanding homogeneity over 45cm DSV
- Best RF fat saturation – with no compromises

PACT
Patient Active Comfort Technology

- Truly open MRI with an unobstructed view
- Patient area lighting to reduce anxiety
- Industry-leading patient table (82cm width, 225kg load capacity and in-gantry lateral movement)
- SoftSound™ gradient technology to reduce acoustic noise
- Multiple coil connections to lower patient examination time

OASIS™ – cutting-edge Technology with a Mission

OASIS™ features the world's first 1.2T open architecture vertical field magnet that delivers advanced clinical performance by applying best-in-class Hitachi technologies to achieve superior image quality and the highest patient comfort level.

HOSS™
High Order Shim System

ensures:
- perfect image quality even in off-centre regions of the body
- high magnetic field homogeneity with large and small fields of view
- uniform RF fat saturation and enhanced imaging capabilities

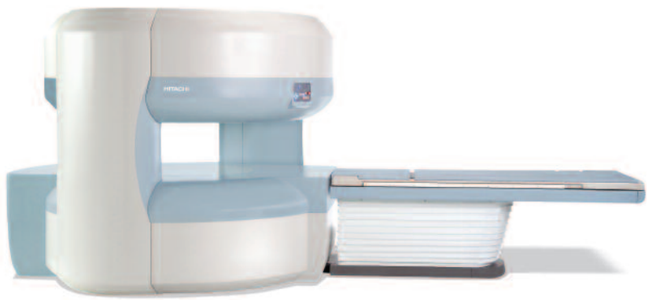
Gradient System

Innovative Hitachi gradient amplifiers and vertical field gradient coils provide the power to scan at high spatial resolution in shortened scan times.

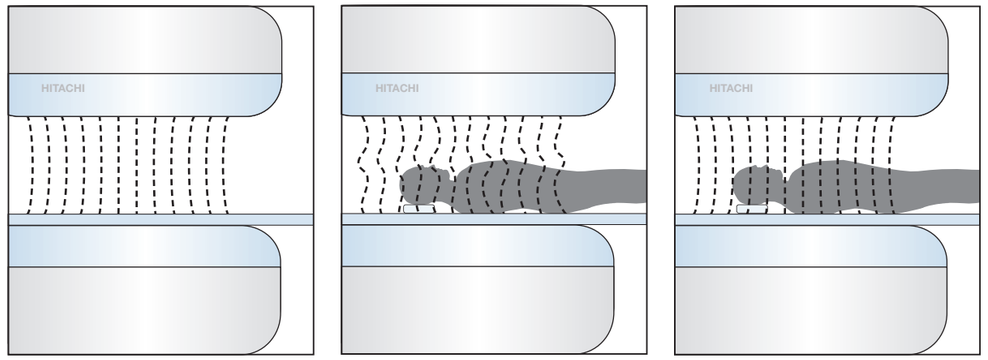
- Peak strength: 33mT/m strength
- Maximum slew rate: 100T/m/s
- Active shimming
- Water cooling
- Eddy current compensation
- SoftSoundTM noise reduction

Zenith RF Coil Technology

OASIS™ image quality is optimised by using a combination of multi-channel RF and Zenith coils. Zenith coils utilise solenoid technology which is known to have a superior signal-to-noise ratio. These coils are unsurpassed in terms of patient comfort, as well as ensuring seamless workflow and supporting a broad range of clinical applications.



HOSS™



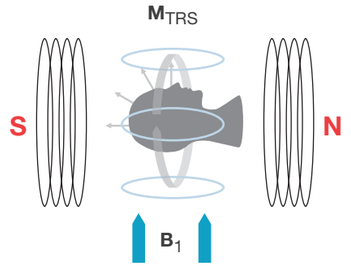
In a uniform (homogeneous) magnetic field, fat and water peaks have a constant frequency separation (at 1.2T approximately 179Hz).

Without **HOSS™**, the patient's body makes the magnetic field non-uniform, making fat saturation inconsistent.

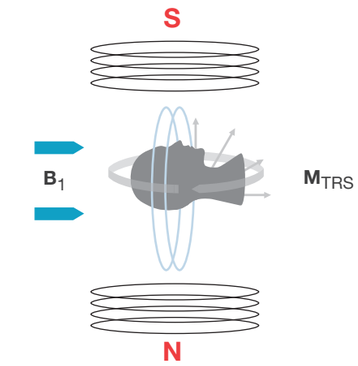
With **HOSS™**, the effect of the patient's body is reduced, promoting consistant fat saturation even across large FOV's.

Zenith Coils

RF Field Orientation



Horizontal Field



Vertical Field

Image Uniformity Result

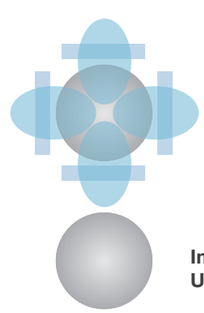


Image Uniformity

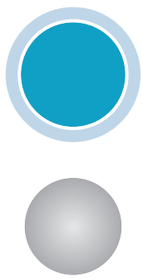


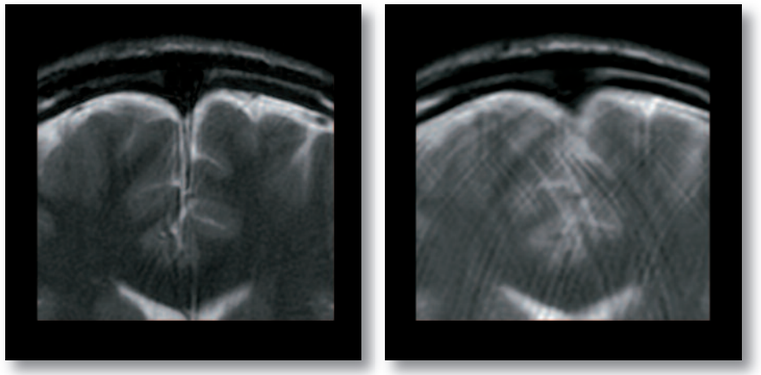
Image Uniformity

OASIS™ – Imaging Features tailored to the Needs of the Patient and you

OASIS™, the most powerful, patient-friendly whole-body MRI, offers a broad range of advanced clinical imaging capabilities. All neurological, vascular, body and orthopaedic imaging tools are available.

RADAR™
Radial Acquisition Regime

- compensates for motion and flow artefacts
- available for all coils and planes



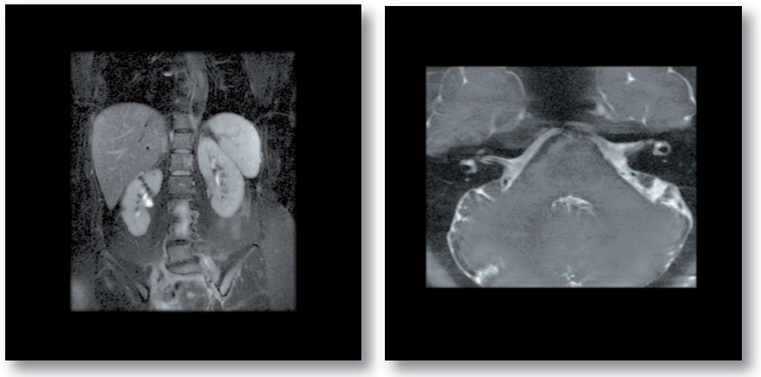
Transverse T2-weighted brain scan image using RADAR™ technique

Transverse T2-weighted brain scan image not using RADAR™ technique

RAPID™
Rapid Acquisition through Parallel Imaging Design

Parallel imaging scan feature:

- increases temporal resolution and image quality
- reduces scan time
- optimises vertical field RF coils



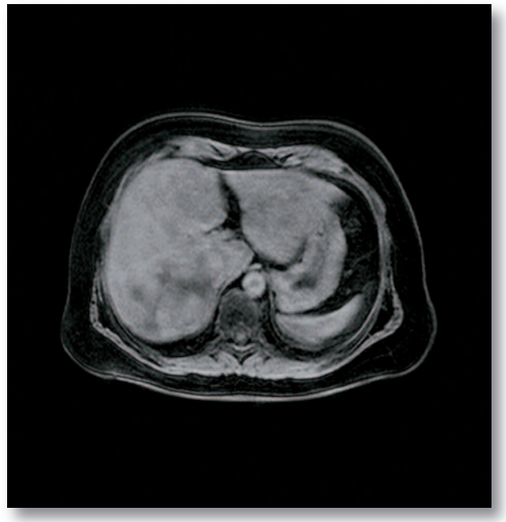
Decreased scan time – breath-hold. Coronal abdominal image with a high-resolution matrix, excellent fat saturation and scan time of only 17 seconds

Increased spatial resolution. High-resolution transverse FSE image of internal acoustic canal with 1024 x 1024 matrix acquired in 2:33 minutes

TIGRE™
3D T1-weighted gradient echo with segmented fat saturation

3D dynamic imaging for thin slice complete organ coverage:

- optimises RF fat suppression
- ensures excellent image quality, especially in abdominal and breast applications



Abdominal, Dynamic TIGRE™, Liver haemangioma

TRAQ™
Time-resolved MRA

- enables ultra-fast 3D dynamic scans in the observation of blood kinetics

Renal Artery CE MRA, MIP

FLUTE™
Fluoro Triggered MRA

- 2D monitoring pulse used to observe bolus, fast switching to 3D when bolus is at area of interest.

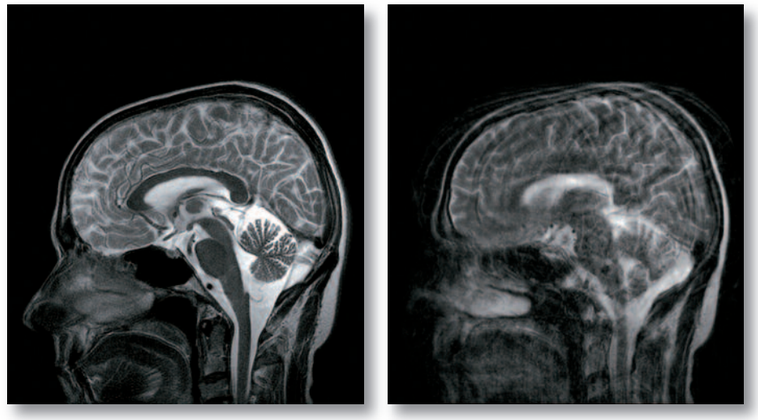
Carotis FLUTE™

VASC™
Non-contrast MRA

- provides an excellent alternative to peripheral bolus MRA for patients with renal insufficiency

VASC™, Non Contrast Vascular Imaging

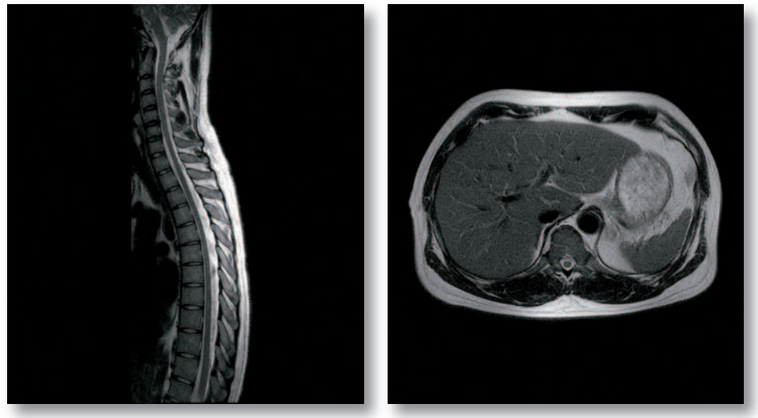
Neuro



Brain T2 sagital using RADAR™ technique, excellent motion supression

Brain T2 sagital not using RADAR™ technique

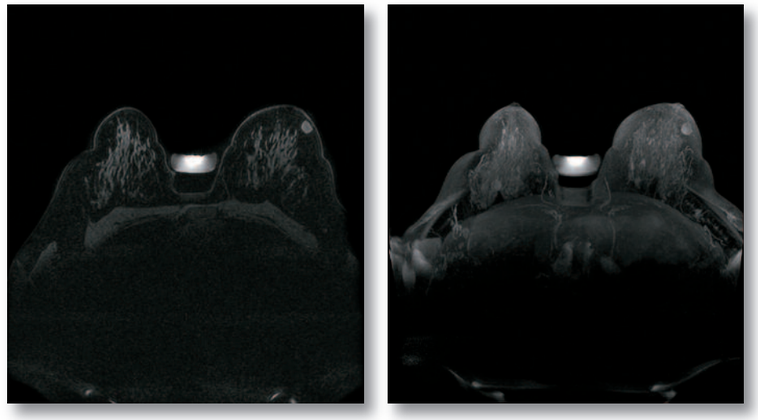
Body



HOSS™, Spinal cord 45cm FOV

HOSS™, Abdominal RADAR™ no breathhold

Breast



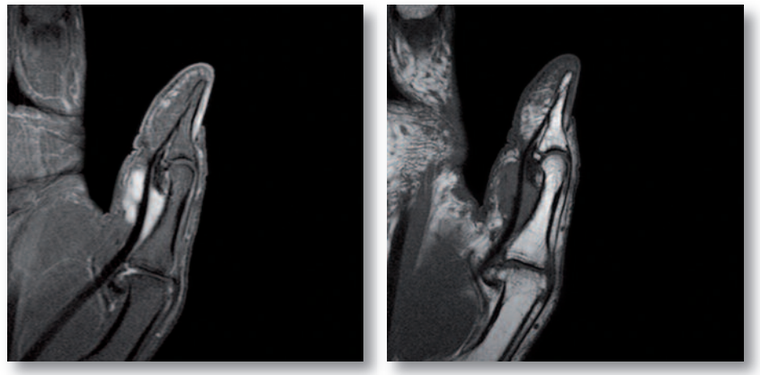
Breast, dynamic TIGRE™

Breast TIGRE™, MIP

Orthopedic

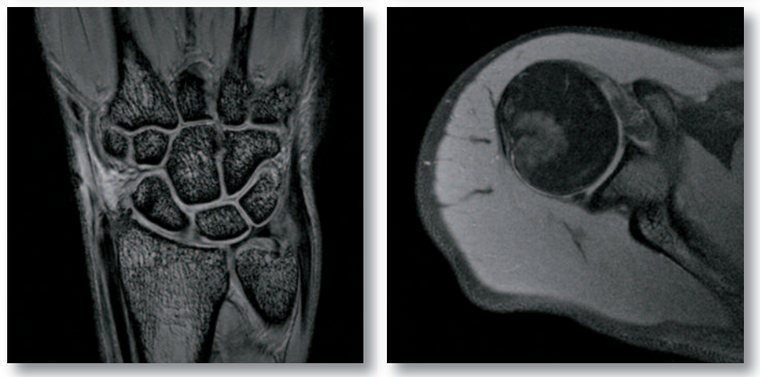
Thumb, FS T1 + Contrast

Thumb T1



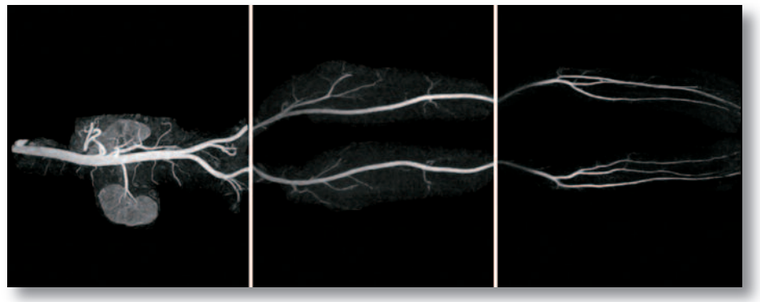
Wrist, 3D GE coronal

Shoulder PD Fat Sat



Vascular

Contrast Enhanced Vascular Angiography



OASIS™

The ultimate patient MRI - open

OASIS™ – and you

OASIS™ offers optimal, effortless Workflow so that you can focus on your Patient.

ORIGIN™ MR Operating Software

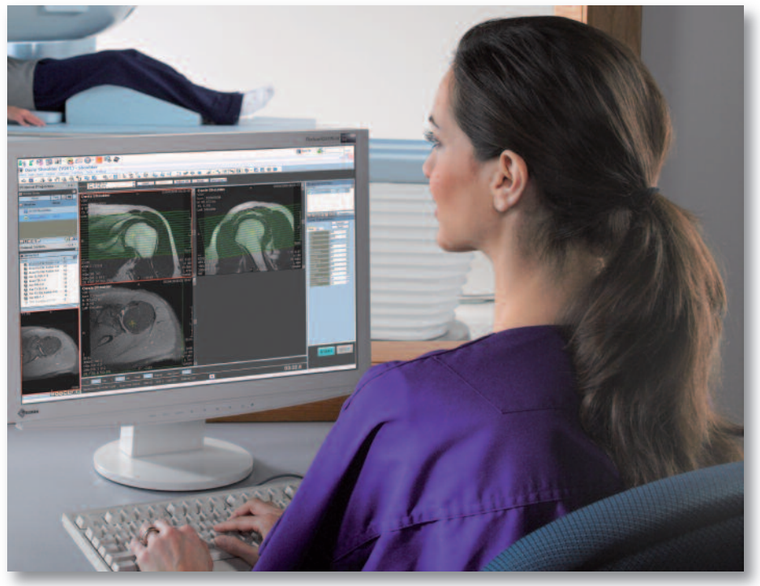
Windows XP-based operating software serves as a familiar environment for moving easily through demanding clinical applications and protocols. From patient registration through scan set-up to image archiving, ORIGIN™ mouse-driven operating software is easy to learn and use.

VERTEX™ Computer System

The OASIS™ computer architecture integrate an advanced scan/reconstruction engine and a dual core CPU configuration. This parallel processing design provides maximum workflow and patient throughput benefits that complement the advantage patient comfort offers in keeping scans on schedule.

Scan/Reconstruction Engine

The OASIS™ scan reconstruction engine incorporates an FPGA Digital RF receiver and dedicated CPUs for parallel multi-channel reconstruction, resulting in the fastest reconstruction times available on the market (up to 5500 images p/sec).



Hitachi Medical Systems' Values and Services

Hitachi Medical Systems combines high technology with the Asian tradition of long-term thinking, a high level of consciousness for quality aspects and the subsequent understanding of service.

In building valuable, long-term relationships with our customers, we have achieved an understanding of their different needs and expectations. This has strengthened our commitment to deliver high-quality products which fulfil the requirements of each unique clinical speciality.

We provide a one-to-one service to secure first-class customer satisfaction. The close working relationships among sales, applications and many other key members of Hitachi Medical Systems guarantee appropriate reactions and fast responses.

We always endeavour to go the extra mile. We succeed because we welcome new ideas, products and services.

Services such as our 360° educational programme, the Hitachi Medical Systems Technology Academy, offering tailor-made, added-value services and solutions for professionals in all fields of medicine and other interested groups.

Hitachi Medical Systems
Technology Academy

We abide by our corporate philosophy which believes that we have a social responsibility to protect our environment, so that the next generation has a firm grounding on which to build a secure future.