HITACHI HEALTHCARE AMERICAS, CORPORATION
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Quotation Number: QUO-10966-L6L1N0
Revision: 2
Quotation Date: 11/19/2019

Hitachi Healthcare Americas

Vermont Open MRI, LLC

Description

103707: Vermont Open MRI, LLC - S Burlington, VT (OASIS)

HHA Specifications for:

Vermont Open MRI, LLC
620 Hinesburg Rd
S Burlington, VT 05403

Quotation Valid:	193 Days
Quote Expires:	5/31/2020
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NON-DISCLOSURE STATEMENT: THE CONTENTS OF THIS SPECIFICATION SHALL NOT BE DISCLOSED TO ANYONE EXCEPT TO EMPLOYEES OF CUSTOMER WITH A LEGITIMATE NEED TO KNOW SUCH INFORMATION WITHOUT FIRST OBTAINING THE EXPRESS WRITTEN CONSENT OF HHAC.

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Vermont Open MRI, LLC

Description

103707: Vermont Open MRI, LLC - S Burlington, VT (OASIS)

OASIS XP 1.2T Open MRI System

OASIS: THE HIGHEST FIELD STRENGTH OPEN MRI SYSTEM

Hitachi Healthcare's Oasis 1.2T Open MRI system sets a high standard for patient-centric care. A unique achievement in diagnostic imaging, the Oasis' truly open architecture features the largest patient imaging space with Zenith RF technology to achieve highly efficient and effective results for your most challenging patients.

Hitachi has been a long-time pioneer of patient friendly MRI systems, demonstrated by open MRI innovations for over 25 years. Now with Oasis 1.2T - the highest field strength Open MRI in the industry - we offer the only MRI system that provides high field imaging with the greatest degree of patient comfort features.

With an unobstructed viewing angle, no other MRI system enables you to capture and retain as broad of a patient demographic as Oasis. Even the most challenging patients can be handled with confidence, without compromising on safety, performance, or efficiency.

Offering unmatched patient comfort, rapid workflow, the latest clinical capabilities, and a 99% uptime guarantee, Oasis 1.2T completes your MRI imaging portfolio ensuring all patient referrals can be handled with the best diagnostic care available.

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Hitachi 1.2T Open Superconducting Magnet with HOAST™

At 1.2 Tesla, Oasis is the highest field strength, whole body vertical field magnet. Only the proven experience of Hitachi could bring this high-field performance to you. Hitachi expertise in vertical field magnet design and solenoid coil signal detection delivers outstanding image quality—with no compromise on patient comfort.

The high uniformity of the magnetic field established during installation is maintained by per patient electronic shimming in two stages. Gradient shimming is applied to reduce linear terms, and in addition Oasis also includes HOAST, per-patient Higher Order Active Shimming Technology and regional shimming. The two levels of shimming enable exquisite RF fat saturation.

Important Oasis magnet features include:

- 1.2T vertical field strength for high SNR
- Iron core for high field strength, uniformity and stability
- Homogeneity: 0.3 ppm@35cm DSV(VRMS) for excellent general image quality and RF fat saturation
- 45 cm FOV in all axes
- Shimming features including computer-modeled passive shims placement and per-patient Higher Order Active Shim Technology
- Active magnetic shielding to minimize the 5 Gauss footprint
- Helium-only cryogen design (single cryogenic cooler) with refill once every two years with HHAC approved maintenance

Patient-Centric Design

Like you, the Hitachi focus is on the patient. Featuring the only available open architecture high field MRI system, Oasis' patient-centric design delivers outstanding patient comfort and operator convenience benefits in concert with diagnostic performance. Oasis has the unique ability to accommodate difficult to scan patients who can't be successfully scanned on conventional horizontal (closed-bore) MRI. Challenging patients such as bariatric, pediatric, geriatric, anxious and claustrophobic are more comfortably accommodated, and ALL patients appreciate the open Oasis environment.

Key aspects of the Oasis design include:

- Unobstructed view offered by our truly open MRI design
  - 30 degree offset table means patients will always have a clear lateral view
  - Patient positioning to optimize isocenter imaging
- 660 lbs. patient weight limit – the highest in the industry
- 82 cm wide table
- Three axis motorized movement
  - 20 cm lateral (in bore)
  - 222 cm longitudinal
  - 40 cm vertical (lowers to 51 cm for easy wheelchair transfer)
- Patient area lighting to further reduce anxiety
- SoftSound™ gradient technology reduces acoustic noise without compromising clinical performance
- Constant two-way communication system reduces patient anxiety
- Operator alert (patient initiated) brings attention to the patient even without speaking

The quadrature T/R Body coil provides the transmit capability for the system, as well as offering an alternative receiver coil when surface and volumetric coils cannot be employed.

A full set of custom pads and straps promotes patient comfort and consistent image quality, with a wide range of patients and body habitus'.

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High Output Gradient System

A high performance gradient system is key to meeting today's expectations for image quality and resolution. Capable of strength up to 33 mT/m and slew rate of up to 100 T/m/sec, Oasis' gradient system enables selection of low TR, TE and IET in combination with small FOV, and thin slices. This level of gradient capability positions Oasis to adapt to changing MRI technology and widening applications. Hitachi's gradient coil mounting technique reduces acoustic noise without compromising image quality or capability.

Zenith™ Radiofrequency System and Zenith Coils

The Hitachi Zenith System is a powerful combination of multi-channel RF technology and Hitachi exclusive Zenith RF coils. Zenith drives excellent image quality, seamless workflow, wide clinical capability and optimized patient comfort. This multi-channel RF system includes RAPID (Hitachi's parallel imaging feature) to reduce scan times and optimize the most comprehensive collection of vertical field RF coils.

Transmit System: An 18 kW solid state transmit amplifier ensures sufficient power is available for the broadest range of patient sizes. Oasis' additional power also leaves room for future expansion of MRI technology that may require additional RF power. SAR is closely monitored and limited to protect the patient while not needlessly constraining the operator. Oasis' transmit and receive system is designed for interactive, real-time parameter changes and motion compensation techniques.

Receiver System:

- 8 channel RF receiver system
- 2 coil connection points on the table
- Automatic coil detection ensures the correct coil is in operation for each step of the examination

Receiver Coils: Oasis' Zenith receiver coils support RAPID parallel imaging as well as conventional imaging modes for maximum clinical flexibility and image quality. These are all Hitachi designs and include features that drive imaging time and quality benefits not available on other equipment. The standard Zenith receiver coils include:

- **RAPID Head** - Patient comfort is complemented by an ultra-fast, high-resolution five channel brain imaging capability that drives image quality and workflow benefits.
- **RAPID Body** - The six channel design enables applications from dynamic abdominal scans to cardiac imaging with RAPID parallel imaging. Included anterior extenders can be used to accommodate very large patients.
- **RAPID Cervical Spine** – Eight channel volumetric solenoid coil sensitivity and RAPID parallel imaging provide excellent C-spine imaging capability, even with kyphotic patients.
- **RAPID CTL** - Optimized to provide the SNR and signal uniformity essential for high quality images of the entire spine. The eight channel multi-mode design (C, C-T, T, L) supports RAPID and conventional imaging
- **RAPID Shoulder** - The six channel coil with a through-arm loop and comfort pads delivers an outstanding axillary penetration capability and coil stability.
- **RAPID Knee** - The six channel knee coil supports high-resolution acquisitions and provides excellent patient comfort in a compact design. The coil's volumetric solenoid technology enables exquisite orthopedic anatomic detail

Additional standard Quadrature, Multiple Array and Solenoid coils include:

- **MA Flexible Body Extra Large** – The industry's largest body receiver coil at 190 cm circumference enables collection of diagnostic images from patients at the extreme of the demographic spectrum
- **Integrated Transmit/Receive** – The transmit coil for the system also provides receive capability delivering good imaging results for patients that cannot be imaged with other Oasis RF coils
- **General Purpose** – The Solenoid design of this coil delivers good SNR for large joint imaging. The coil can also be used as a Brain coil

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Vertex II Computer System and Origin MRI Operating Software

From patient registration, through scan planning, scanning, image processing and image management, Oasis' Vertex II computer and Origin MRI operating Software featuring Evolution 5 deliver excellent image quality results with seamless workflow. The Origin Clinical Study Library, Graphical User Interface (GUI), Intelligent Parameter Guidance and Real-time Image Quality Calculator make scan planning a breeze for even the most complex examinations. Simultaneous scan, reconstruction, and multi-tasked image processing keep patient volume high. With Oasis, your operational efficiency is assured.

Vertex/Origin features include:

- Minimal operator interaction – fewer mouse clicks
- Wide 24 inch LCD workspace
- User customized protocols combining multiple sequences and post processing steps are provided, ensuring efficient, easy completion of the most complex imaging tasks
- Export of protocol in HTML format for documentation, archiving or sharing
- Permanent Hitachi protocol recommendations are provided for reference or everyday use
- Intelligent Parameter Guidance for quick resolution of parameter selection conflicts
- Basic and Advanced control modes adapt to user experience
- Real time Image Quality Calculator shows impact of parameter changes on relative CNR (Contrast to Noise Ratio) and SNR (Signal to Noise Ratio) prior to scanning
- Real time spatial resolution update shows impact of parameter changes prior to scanning
- Simultaneous scan and reconstruction for seamless workflow
- CD/DVD writer combines patient images with auto launching viewer for patient and referring physician convenience
- Patient data security features including audit trail and user authentication

Imaging Capabilities

The powerful, cutting edge Oasis imaging architecture delivers its outstanding clinical imaging benefits through the Imaging Suites. The Oasis standard Imaging Suites include a broad range of acquisition sequences, sequence enhancements and post processing tools. Scanning and processing features are available to meet the clinical challenge in Neuro, Orthopedic, Body, Vascular, Breast, Cancer, Cardiac, and Pediatric imaging.

RAPID: Oasis's RAPID Parallel imaging software enables acceleration in slice and/or phase directions, allowing increases in temporal resolution for dynamic imaging, shortened scan times and reduced susceptibility effects for DWI, among many other benefits .The user can employ either a RAPID pre-scan calibrated technique for the fastest possible imaging (typically Brain) or a RAPID self-calibrating technique that collects calibration data intra-scan for excellent image quality even with physiological motion (typically for abdominal acquisitions). RAPID parallel imaging capable receiver coils are the Oasis standard as well – virtually all of the Oasis coils are designed for use with RAPID.

RADAR: (RADial Acquisition Regime) is a powerful tool for collecting motion suppressed images without sedation or excessive patient restraint. RADAR relies on a radial k-space filling technique. Its 2D and 3D modes, combinability with fat saturation, T2, FLAIR, STIR, SE, GE (Gradient Echo), TOF (Time of Flight) or BASG type contrast plus its application to all coils, anatomy and slice planes nets the most broadly applicable radial feature available in MR imaging.

BASG - Balanced SARGE: Hitachi's BASG pulse sequence is available in 2D and 3D modes, and can be combined with RF fat saturation. BASG delivers high signal to noise bright fluid images, and is ideal for high spatial resolution cardiac, body, orthopedic and neuro imaging applications.

WE - Water Excitation: An alternative to CHESS type fat suppression, useful for dynamic studies and cartilage imaging applications in combination with BASG (Balanced SARGE) or RSSG (RF spoiled SARGE).

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Imaging Capabilities (con't)

H-SINC RF Fat Saturation: Hitachi proprietary RF fat saturation technique. The HOAST feature plus H-SINC Light and Heavy modes ensure users can deliver excellent RF fat suppression uniformity from large to small field of view for a broad range of clinical applications. Heavy mode is designed to address the challenges of Breast and Body applications in particular, while the Light mode is useful in Neuro and orthopedic applications.

TIGRE: Fast T1 weighted 3D Gradient Echo sequence with fat suppression enables the combination of high spatial and high temporal resolution for outstanding dynamic body and breast imaging.

TIGRE C: TIGRE T1 Fat suppressed volume imaging capability for dynamic imaging can be combined with Fluoro triggering and TPEAKS centric k-space ordering. TIGRE C simplifies arterial phase capture for breath-hold body imaging, shortens breath hold time as much as 20% and boosts SNR for Body and Breast dynamic imaging applications.

FLUTE: Fluoro triggered MRA enables easy, consistent capture of the arterial phase. Users monitor the artery of interest for bolus arrival using real time scanning mode, switching instantly to the 3D diagnostic scan upon arrival. FLUTE with TPEAKS k-space ordering ensures minimal venous contamination.

PEAKS, RPEAKS, TPEAKS: Hitachi's centric k-space ordering techniques for MRA ensure easy, consistent capture of the critical arterial phase. Three different implementations provide for maximum clinical flexibility.

TRAQ: Time resolved MRA (4D imaging) provides insight into the dynamics of blood flow, enabling effortless depiction of arterial and venous phases, without consideration of bolus timing.

Diffusion Imaging: The high slew rate gradient system, SS-EPI (Single Shot Echo Planar Imaging), pre-programmed multiple axis acquisitions, and automatic creation of ADC and isotropic images make the Oasis diffusion imaging capability powerful and workflow oriented.

VASC Non-Contrast MRA: For cases complicated by renal insufficiency, users can employ Hitachi's VASC pulse sequence, netting excellent renal and peripheral vessel image quality without a bolus.

primeFSE and primeFIR: Oasis delivers user adjustable bandwidth and direct TE selection for ultimate Fast Spin Echo flexibility. Bandwidth selection enables excellent depiction of anatomy in the presence of prostheses.

NATURAL: Patient-specific image quality enhancement algorithm for optimal image uniformity.

3D-GEIR: Volume gradient echo sequence, delivers enhanced T1 contrast with high grey-white matter differentiation. Isotropic acquired images can be reconstructed in arbitrary planes with the MPR feature with excellent image quality.

Image Stitching: Contiguous sagittal or coronal images can be joined to provide a seamless extended field of view single image. Stitched images may be exported in a DICOM compliant format.

Flexible Reconstruction Matrix: Removes the power of two restriction on reconstruction matrix dimensions. Reconstructed images can be size-optimized to more closely reflect the anatomy of the scan.

VIVID: New image enhancement algorithm reduces noise while at the same time increasing contrast in fine structure and edges. VIVID can be applied post acquisition or implemented within the scan protocol.

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Clinical Suites

NeuroSuite Features

The vital pulse sequences, acquisition features and post processing tools for high-quality imaging of the brain, head/neck and spinal structures are standard on Oasis. Oasis' powerful gradient system drives short neuro scan times for high throughput.

- Preprogrammed and user customized Head and Spine Protocols
- RAPID Head coil for high SNR and signal uniformity
- RADAR motion compensated imaging technique (all plane, all coil) for uncooperative or infirm patients
- High resolution – up to 1024 imaging
- Large 45cm FOV (all axes) complemented by HOAST features ability to deliver excellent large FOV RF fat suppression
- Image Centering places center of prescribed slab at magnet isocenter automatically for best neuro image quality
- Fat Suppression including RF Fat saturation, STIR, Water Excitation
- 3D BASG (Balanced SARGE) sequences for IAC imaging with bright fluid
- High resolution 3D-FSE and Driven Equilibrium 3D FSE for IAC imaging
- Volume acquired datasets can be reconstructed in any plane with MPR (Multi-Planar Reconstruction)
- FLAIR, Fast FLAIR and RADAR-FLAIR for CSF suppression
- MR Myelography with 3D-FSE and 3D BASG (with fat suppression)
- Multi-slice Fast Spin Echo supports up to 256 echo train
- Diffusion Weighted Imaging with fat suppressed single shot and high resolution multi-shot techniques and ADC mapping capabilities
- 3D-GEIR volume gradient echo sequence, delivers enhanced T1 contrast with high grey-white matter differentiation. Isotropic acquired images can be reconstructed in arbitrary planes with the MPR feature with excellent image quality
- ADAGE uses combinations of multiple echoes to create high contrast T2*-weighted images with reduced chemical shift. Enhances Gray/White matter contrast in spine imaging
- Image Stitching provides contiguous sagittal or coronal spine images that can be joined to provide a seamless extended field of view single image. Stitched images may be exported in a DICOM compliant format

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OrthoSuite Features

Only Oasis delivers the very high field strength and truly open architecture enabling exquisite orthopedic MR imaging. Its inherent high SNR potential promotes high spatial resolution critical for orthopedic imaging, and permitting all anatomy to be imaged at isocenter delivers remarkable RF fat saturation.

- Preprogrammed and user customized Upper and Lower Extremity Protocols
- 2D/3D pulse sequences
- Isocenter positioning promoted by lateral table movement and the extra wide table ensure excellent shoulder and extremity fat saturation and general image quality
- RADAR motion compensated imaging technique for uncooperative or infirm patients also minimizes popliteal flow artifacts for knee imaging applications
- Excellent off isocenter fat suppression with the HOAST feature's Regional Shimming capability. Patient's enjoy comfortable wrist and shoulder positioning with no compromise on RF fat saturation
- RAPID Shoulder demonstrates excellent image quality including high SNR labrum depiction with unique "under the arm" loop and RAPID parallel imaging capability
- RAPID Knee coil supports high-resolution acquisitions providing exceptional orthopedic anatomic detail
- Driven Equilibrium FSE enables heavy T2 weighting (increased CNR) with limited scan time
- Fast STIR fat suppression
- Cartilage imaging excels using Water Excitation and BASG (Balanced SARGE) 3D Gradient Echo sequences
- ADAGE uses combinations of multiple echoes to create high contrast T2*-weighted images with reduced chemical shift. Improves fluid/cartilage differentiation.
- primeFSE's user selectable receiver bandwidth enables exquisite FSE image quality in the presence of prostheses or implants and delivers multi-echo FSE for PD and T2 weighted acquisitions in one sequence
- MR arthrograms benefit from excellent RF fat suppression
- Kinematic imaging support for TMJ studies using RAPID Head coil
- H-SINC RF fat saturation technique delivers uniform suppression over large to small FOVs

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BodySuite Features

The exceptional power of Oasis is demonstrated in this demanding and fastest-growing group of applications. High SNR from the 1.2T magnet and Zenith RF coil technology is complemented by the TIGRE fast, fat suppressed imaging sequence and Hitachi's all coil/all plane motion compensating RADAR technique. 2D and 3D protocols for abdomen, pelvis, MRCP and dynamic liver imaging techniques are all standard.

- Preprogrammed and user customized Body Protocols
- 2D/3D pulse sequences
- Breathing artifact is suppressed for abdominal imaging using Hitachi's RADAR motion compensated imaging technique
- Respiratory triggered techniques benefit from expiratory phase sensing
- Breath hold and free breathing acquisitions supported
- RAPID parallel imaging with the Torso/Abdomen coil for fastest scanning while maintaining excellent SNR
- 3 total standard Body imaging coils: Extra Large Flex, RAPID Body and the T/R Body coil deliver high SNR and broadest patient population support available
- In/Out of phase multi-echo Gradient Echo technique
- Abdominal diffusion weighted imaging (DWI) allows multiple b-values with independent NSA settings in one acquisition
- T2 Echo Factor Compensation provides very fast high quality ss FSE imaging
- T/R Body Coil Shim Scan provides consistent image quality for abdominal and cardiac regions
- HOAST (Higher Order Active Shimming Technology) drives excellent large FOV fat suppression in all planes.
- TIGRE standard fast T1 weighted 3D Gradient Echo sequence with fat suppression enables the combination of high-spatial and high temporal resolution for outstanding dynamic liver and breast imaging
- TIGRE C T1 fat suppressed volume imaging capability for dynamic imaging can be combined with Fluoro triggering and TPEAKS centric k-space ordering. TIGRE C simplifies arterial phase capture for breath-hold liver imaging, shortens breath hold time as much as 20% and boosts SNR for Body and Breast dynamic imaging applications
- Dynamic Liver studies benefit from Oasis's large FOV, uniform fat suppression from the HOAST higher order active shimming feature, and the highly sensitive 6 Channel Torso/Abdomen coil
- Volume acquired datasets can be post processed with MPR to yield images from any plane

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VascularSuite Features

Conventional 2D/3D TOF and advanced acquisition techniques such as Time Resolved MRA (TRAQ) and 3D vessel post-processing features provide the tools you need in this fast-growing application segment.

- Preprogrammed and user customized Vascular Protocols
- 2D/3D inflow and bolus methods
- RAPID parallel imaging for fastest scanning while maintaining excellent SNR
- RADAR-TOF provides diagnostic results for patients unable to keep motionless
- Sloped Slab Profile (SSP) and Magnetization Transfer Contrast (MTC) methods for uniform signal intensity and background suppression
- MRA benefits from 100 T/m/sec slew rate – short TE's are available to minimize intravoxel dephasing
- ECG gating is standard to maximize image quality
- VASC Non contrast MRA sequence provides an excellent alternative to bolus MRA for patients with renal insufficiency
- TRAQ Time resolved MRA provides insight into the dynamics of blood flow, enabling effortless depiction of arterial and venous phases, useful when flow direction is uncertain
- FLUTE Fluoro triggering for easy, consistent arterial phase capture
- PEAKS, RPEAKS, TPEAKS: Hitachi's centric k-space ordering techniques ensure easy, consistent capture of the critical arterial phase. Three different implementations provide for maximum clinical flexibility
- MIP (Maximum Intensity Projection) and Volume Rendered MIP for excellent 3D vessel depiction
- 2D/3D Phase Contrast MRA acquisition and analysis, enables VENC selection from 5 cm/s to 400 cm/s to meet a wide range of clinical needs. Velocity analysis graphs and statistical reports are standard

CardiacSuite Features

Basic cardiac imaging is supported by standard dark blood and bright blood sequences and the standard, six channel Body coil.

- Preprogrammed and user customized Cardiac Protocols
- Cardiac, Peripheral and Respiratory gating system
- Interactive Scan Control (I-Scan) enables efficient imaging plane selection and real-time image collection with slice position and scan parameter change and update during MR Fluoro acquisition
- Double/Triple IR FSE pulse sequences for black blood morphological imaging
- 2D/3D BASG (Balanced SARGE) bright blood sequences support functional analysis
- RADAR motion compensated imaging technique enables artifact suppressed free breathing acquisitions for uncooperative or infirm patients
- RAPID parallel imaging with Torso/Abdomen coil for fastest scanning while maintaining excellent SNR
- Multiphase bright blood imaging
- Real-time cine review

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VALUE ADDED SUPPORT BENEFITS

Oasis customers covered by a Premium service or warranty agreement enjoy exclusive benefits from a range of value adding support features. From maximizing equipment uptime, through maintaining optimal image quality from patient to patient, to helping you market your MRI imaging service, you'll find Hitachi delivers benefits not found anywhere else.

Clinical Support

On-site Applications Training

Oasis customers will receive two weeks of initial training (Monday through Friday, including travel time). Training topics include:

- MR magnet safety
- Hitachi MR System operation
- Patient positioning in the RF coils

ASRT Continuing education credits (CEUs) will be awarded to all technologists that are involved in at least 24 hours of scanning procedures during applications training.

Unlimited Follow-up Applications Training

Follow-up applications training visits will be provided during the warranty period at no additional charge. The first follow-up applications visit is usually scheduled to occur within 6-12 weeks after initial training. The follow-up applications training visit will provide additional system training along with advanced applications such as MRA refinements, cardiac imaging and site specific special applications. Additional no-charge visits throughout the warranty period will be scheduled at the customer's request.

Applications Helpline

Hitachi provides an MRI applications helpline service for customers under warranty or service agreement. This U.S. based dedicated line for applications assistance is available from 8:00 a.m. to 9:00 p.m. EST, Monday through Friday, and is staffed by Hitachi-experienced MRI technologists, ready to help you with your clinical challenge. The Hitachi Applications team can further assist you by taking advantage of the Sentinel remote support feature to review images in real-time with you. Our experts can see what you are seeing, expediting resolution of clinical challenges.

HITS (Hitachi Institute for MRI Technologists)

This program is designed to prepare technologists for initial on-site training, educate new users to MRI principles or to assist experienced personnel with Hitachi MRI System's capabilities. Hitachi offers this educational program at scheduled intervals at our headquarters throughout the year to customers under warranty or service agreement, at no additional charge. Customers are only responsible for T&L expenses.

Detailed information can be found on our website: http://www.hitachihealthcare.com/CustomerSupport/

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Clinical Support (con't)

MRI Accreditation Support

Hitachi provides accreditation support benefits at no additional charge to customers under warranty or service agreement. These key benefits ensure the best possible performance of Hitachi MRI equipment, and help you put together the best possible submission. We provide a highly informative Hitachi specific Accreditation Guidebook, we will assist you in collecting technical equipment performance data, phantom testing, and we are available to advise you on all aspects of the accreditation programs via the Applications Helpline. While we cannot guarantee success with ACR, IAC or TJC (American College of Radiology, Intersocietal Accreditation Commission or The Joint Commission) accreditation, we have vast experience assisting our customers with attaining accreditation with all these organizations.

Marketing Support

Customer Marketing

Hitachi knows to have a commercially successful MRI business, you have to do much more than simply open your doors. That's why we provide an array of marketing tools to promote your facility to both referring physicians and patients alike. This marketing program has been highly effective for Hitachi customers nationwide.

Some of the materials and tools we provide at no charge:

- Marketing Guide with explanatory materials to further your understanding of marketing plans, medical imaging marketing, physician relationship building, and MRI
- Sample Copy for Press releases, Physician letters, Fact Sheets that speak to features of the Hitachi products to help you promote your Hitachi equipped service
- Advertising templates
- Sample customizable printed brochures for patients and referring physicians ready for your facility information
- Digital MR images, PowerPoint presentation, Equipment photography, Patient information video, web banner samples

You will also have access to our web portal site for marketing support at www.hitachihealthcare.com.

Hitachi will also provide marketing consultation or training on request, delivered by our staff of imaging experts.

Advanced Marketing Program (AMP)

In addition to basic marketing support, Hitachi also offers the Advanced Marketing Program (AMP) to Oasis customers covered by warranty or Premium service agreements. This is a strategic level program uses your facilities logo, colors and branding and requires no creative or development cost. Some of the Hitachi AMP benefits are:

- Strategic briefing
- Print ad creation
- Billboard design
- Mailer design
- Copy writing assistance
- Introduction materials
- Open house materials
- Referring physician sheets
- Product banners for web site
- Flash ads - poster design
- Patient downloads for web site

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Equipment Support

Systematic Preventative and Uptime Maintenance Program

At Hitachi Healthcare Americas, we take pride in our 99% Uptime Guarantee, which assures you of superior reliability, continuous applications assistance and customer support.

- Immediate response nationwide
- Hitachi trained service engineers
- After-hours preventative maintenance available
- Maintained specified system performance for MRI accreditation
- Software updates

Sentinel Remote Customer Support

Sentinel enhances both clinical and equipment support for the Oasis. Sentinel continuously monitors key systems and maintains a secure, high speed link to Hitachi providing for:

- 24/7 critical system monitoring provides automatic detection of operational problems
- Remote diagnostics with automatic notification of Hitachi Service Department
- Remote diagnostics run from Hitachi's National Technical Support Center
- Help with challenging clinical cases from Hitachi's National Customer Support Center
- Works within IT infrastructure providing high security and privacy

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OASIS OPEN HIGH FIELD MRI TECHNICAL SPECIFICATIONS

Magnet Specifications

Hitachi designed and manufactured for high performance and reliability

- Magnet Type: Superconducting Iron Core
- Field Strength: 1.2 Tesla
- Field Orientation: Vertical
- Shielding: Active self-shielding
- 5G Fringe field from isocenter
  - Horizontal: 4.0 m
  - Vertical: 3.3 m
- Gantry Size (L x W x H): 2.7 m x 2.5 m x 2.1 m
- Patient Aperture: 44 cm
- Magnet Weight: 29,100 lbs
- Static Field Homogeneity: 0.3ppm @ 35cm DSV (VRMS)
- Shimming:
  - Installation: Computer placed iron shims
  - Patient: Linear plus Higher Order Active Shim Technology (HOAST)
- Cryogen: Helium only
- Refill Frequency: Once every two years with Hitachi service

Zenith RF System Specifications

Powerful transmitter and sensitive receiver electronics ensure the high SNR potential of the Oasis magnet is realized in your imaging results

Solid State Transmitter

- Quadrature transmitter
- 18 kW Peak Envelope Power
- Quadrature radial type transmit and receive coil

Digital Receiver

- Eight independent channels standard
- Two table-top connection points
- Ultra-low noise figure (0.5 dB) coil mounted preamplifiers
- Variable Receive Bandwidth (manual or automatic)
- RAPID parallel imaging capability

Custom Coil and Accessories cabinet provides organization and in-room storage for all standard and optional coils, as well as other accessories such as table pads, straps and test phantoms.

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Gradient Specifications

Hitachi amplifiers and proprietary eddy current compensation technology delivers imaging excellence in general to advanced applications

- Peak Amplitude: 33 mT/m
- Peak Slew Rate: 100 T/m/s
- Cooling method: Water
- Shielding: Active
- Eddy Current compensation: Computer optimized, with B0 compensation
- Gradient noise reduction: SoftSound mechanical gradient noise dampening

Patient Table Specifications

The Oasis patient table width and capacity helps you efficiently manage the most challenging patients

- Industry best 660 lbs. weight limit
- Industry best 82 cm wide (moving portion)
- 2 coil plug-in points
- 3 axes motorized movement
- In-bore lateral movement
- Lowers to wheelchair height (19”)

VERTEX II Workstation Specifications

Fast GUI, simultaneous scan and reconstruction drive high workflow efficiency

- Host CPU: Core i5
- RAM: 8 GB
- Operating System: Windows® based, mouse driven intuitive GUI
- Ethernet Interface: 10/100/Gigabit Auto-sensing
- High Resolution monitor: 24 inch LCD color monitor
- Operator input: Mouse and QWERTY keyboard
- Magnetic disk: 3.5 inch 320 GB storage capacity, capable of holding 400,000 images at 256x256 matrix
- Image storage: DVD writer for image data storage. Reliable DVD-R/+R 4.7 GB media stores up to 30,000 images
- Intercom: Two way patient - operator
- System controls: Start scan, pause scan, abort scan, emergency stop
- Security Features: User Authentication, Automatic Logout and Audit Log

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Interoperability features

With today's need for Electronic Medical Records, connectivity and informatics in medical imaging are key. DICOM 3.0 compliance is a cornerstone of Oasis' Origin software. Image Storage (SCP/SCU), Query/Retrieve (SCP/SCU), Storage Commitment and Print are all provided. Automatic transfer of image series (transfer on scan or exam completion) is basic to Oasis' Storage feature. Auto store to multiple destinations simultaneously is possible.

Oasis supports the DICOM Enhanced MR Image Object which provides more standardized information about the images when transferred to compatible receiving nodes like PACS or workstations. For each DICOM receiving node, Oasis can be configured for MR Image Object, or Enhanced MR Image Object. Secondary capture and transfer of color image data is also supported.

Pulse Sequences

General to advanced, the acquisition sequences you need to meet the clinical challenge

- Spin Echo (SE) with up to 4 echoes
  - RADAR-SE for motion compensated T1 imaging
- 2D/3D Gradient Echo (GE) and Multi-Echo Gradient Echo
  - Multi-echo Gradient Echo
  - ADAGE combined echo imaging
  - RADAR-GE
- Inversion Recovery (IR)
  - FLAIR
  - STIR
- 2D/3D Fast Spin Echo (FSE)
  - Echo Factors (ETL): 2-256
  - User defined Inter Echo Spacing, TE
  - User defined Echo allocation including Centric, Anti-centric, ADA, and Sequential
  - Single Shot FSE-Ultra fast acquisition, Ultrahigh Echo Factor for MRCP, MR Urography, and MR Myelography
  - Driven Equilibrium- Increases SNR and Contrast over conventional FSE without increasing TR
  - RADAR radial k-space acquisition
  - primeFSE – uses centric k-space ordering feature enables an SNR increase over conventional methods, user selectable receiver bandwidth and excellent multi-echo (PD and T2 weighted) FSE imaging
- 2D opFSE – Fast Spin Echo sequence optimized for clarity, contrast and SNR
- Fast Inversion Recovery (FIR)
  - Echo Factors: 2-256
  - Inversion Time: 20-8000 ms enables Fast STIR, Fast FLAIR imaging
  - Driven Equilibrium
  - primeFIR
  - RADAR radial k-space acquisition
  - Double and Triple IR Black Blood acquisitions
- Steady-State Acquisition Rewound Gradient Echo (SARGE SG)
  - RF-Spoiled SG- (RSSG) provides T1 weighting
  - Rephased SG -Flow compensation for reduced artifacts
  - Balanced SG (BASG) –Completely balanced SG provides high SNR and bright fluids in a rapid acquisition
    - RF fat saturation and phase-cycled fat suppression cardiac imaging
    - RADAR – BASG for motion compensated abdominal and cervical spine imaging
    - Time Reversed SG (TRSG)- T2 weighted Fluoro acquisition

Description

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Pulse Sequences (con't)

- Diffusion Weighted Imaging (DWI)
  - Single Shot SE EPI
    - Multiple b-values and variable NSA values in the same acquisition series
    - B-Factor: 0-2000
    - RF Fat Saturation
    - IR pulse
- TIGRE - 3D T1 Gradient Echo
  - Fast gradient echo with optimized fat suppression for dynamic breast and abdomen imaging
  - TIGRE C – combined with Fluoro triggering and TPEAKS for liver imaging
- 2D/3D TOF
  - High contrast blood flow visualization
  - Combine with pre-saturation to image arteries or veins
  - Single slab or multi-slab (3D)
  - RADAR-TOF
- VASC Non-contrast MRA
  - Bright fluid BASG sequence with walking pre-sat
- Phase Contrast MRA (PC-MRA)
  - Velocity Encode: 5-400 cm/sec, increment 1 cm/sec
  - No contrast agent

Acquisition Features and Protocol Enhancements

Scan fast and deliver excellent results using these pulse sequence enhancements and features designed to maximize quality and increase ease-of use

- Image Plane Selection
  - Transverse, sagittal and coronal
  - Single and double oblique
  - Multi-slice, multi-angle
  - Radial for simplified MRCP, knee acquisition planning
  - Multi-plane for combined sagittal, coronal, axial acquisition (SC, SCA, CA, or SA)
  - Interactive Scan Control (I-Scan) enables efficient imaging plane selection and real-time image collection with slice position and scan parameter change and update during MR Fluoro acquisition
- Prescan
  - RF power adjustment
  - Center frequency
  - Volume shim adjust
- User Defined Regional Shim
- Fat Suppression Techniques
  - Water Excitation (Binomial technique)
  - Graphical presentation of fat-water peaks
  - Graphical prescription of RF fat suppression frequency
  - RF Fat Saturation (conventional SINC pulse)
  - H-SINC RF Fat Saturation (Light mode for lipid only, Heavy for lipid and olefinic suppression)
  - STIR, Fast STIR (FIR)
  - In/out of phase GE

Description

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Acquisition Features and Protocol Enhancements (con't)

- Motion Compensation
  - RADAR radial acquisition (FSE, FIR, FLAIR, SE, GE, TOF, BASG)
  - Gradient rephasing
  - Presaturation pulses – up to eight
  - Walking presaturation
  - Cardiac gating with arrhythmia rejection
  - Peripheral pulse gating with arrhythmia rejection
  - Respiratory gating
  - Diaphragm navigation echo
  - Intermittent presaturation
- User defined variable bandwidth
- Dual slice acquisition
- Rectangular field of view
- Anti-aliasing
- User defined inter-echo spacing
- Half scan and 3/4 scan
- Half echo
- Asymmetric Measurement Imaging (AMI)
- Real time image quality indicator (relative CNR, SNR)
- Real time spatial resolution update shows impact of parameter changes prior to scanning
- Silent Mode gradient noise reduction scan mode
- Image Centering – places center of prescribed slab at magnet isocenter automatically for optimal image quality
- Auto Voice
- Coil mode search optimizes SNR when multiple coils are used simultaneously
- NATURAL™ image quality enhancement algorithm
- Dynamic Scan Time Table Window provides graphical review of dynamic scan procedure (steps and timing) for easy and efficient study planning

Image Processing Tools

Maximize image quality and workflow efficiency with these multi-tasked tools and features. Most are combinable with scanning to keep interaction requirements to a minimum

- Maximum/Minimum/Average Intensity Projection (MIP)
  - Sliding and expanding MIP capabilities
  - MRA post processing tool
  - Freehand, elliptical, and rectangular cropping
  - Include/Exclude mode
  - Sliding, expanding mode
- Multiplanar Reconstruction (MPR)
  - Parallel cut
  - Parallel slant cut
  - Radial cut
  - Curved
- Vascular Volume Rendering
  - Radial, sliding, and expanding projection modes
  - Opacity setting

Description

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Image Processing Tools (con't)

- Filtering Tools
  - Adaptive imaging filter
  - Edge enhancement
  - Image mask
  - IQ2 k-space signal processing
- Image addition and subtraction
- Calculated Images (Proton Density, T1 and T2)
- Dynamic analysis
  - Multiple graph modes include: Normalized Signal Intensity time graph, Multiplicative Signal Intensity-time graph, and Signal Intensity change rate-time graph
  - Multi-slice support
  - DICOM exportable
- Diffusion Analysis
  - ADC map
  - Isotropic DWI map
- Image Review Tools
  - Unlimited series review
  - Flexible window layout
- Filming Tool with configurable layouts
- Viewport Tools
  - Maximize/Resize
  - WW/WL
  - Magnify
  - Rotate/Reverse
  - Cine tool
  - Comment/Annotate
  - ROI (circular or rectangular)
  - Measuring functions
  - Statistics
  - Overlay
- Protocol/Task management
  - Windows Explorer style
  - Protocol editing without loaded study
  - Categorized Anatomic Protocol Library
- System Tools
  - Job Queue
  - Stopwatch
  - Waveform display
  - Patient table settings
  - System settings