

SVKM/TMPMH/MRI /002

CLIENT NAME:

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MEMORIAL HOSPITAL ,
MEDICAL COLLEGE AND
RESEARCH CENTER,
SHIRPUR**

RADIOLOGY TENDER

TENDER DOCUMENT:

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SECTION 2 – SPECIFICATIONS

	Technical Specifications for 1.5T MRI
1	MAGNET:
a.	Whole Body 1.5Tesla Magnetic Resonance Imaging System optimized for higher performance in Whole Body and Vascular examinations with superconducting Magnet, high performance gradients and Digital Radio Frequency System.
b.	1.5T actively shielded super conductive Magnet should be short and non-claustrophobic.
c.	It should have at least 60 cm patient Bore with flared opening.
d.	Magnet length (cover to cover) should preferably be less than 200cm.
e.	Homogeneity of Magnet should preferably be less than 2 ppm over 40 cm DSV.
f.	The Magnet should be well ventilated and illuminated with built-in 2 way intercom for communication with patient.
g.	It should have a built in Cryo-Cooler such that Helium consumption does not exceed 0.05 lit/ hour. (Lowest will be preferred).
h.	An Emergency rundown Control should be provided at Operator Console Room and Gantry Room.
i.	Fringe field 0.5 Gauss line radius is essential.
2	SHIM SYSTEM:
a.	System should have High performance, highly stable shim system with global and localized automated shimming for high homogeneity magnetic field for Imaging and Spectroscopy.
b.	Auto shim should be available to shim the magnet with Patient in position
3	GRADIENT SYSTEM:
a.	Actively shielded Gradient System
b.	The gradient should be actively shielded with each axis having independent Slew rate of at least 100 T/m/s and a peak amplitude of 30mT/m. (Usable over 45 cm of FOV preferably in all directions).
c.	The system should have efficient and adequate Eddy current compensation.
d.	Effective cooling system for gradient coil and power supply.
e.	Duty Cycle – 100% the gradient power amplifier should be water cooled. Please give details of type of cooling.
f.	Specify the FOV in cms for X-Y-Z Direction.
4	RF SYSTEM:
a.	It should be a fully Digital RF system, capable of transmitting power of at least 15 KW or more.

b.	It should also have preferably 8 independent RF receiver channels with each having bandwidth of 1 MHz or more along with necessary hardware to support quadrature ICP array/Matrix Coils.
c.	It should support Parallel acquisition techniques with a factor of up to 2 in 2D.
d.	Should allow remote selection of coils and / or coil Elements.
5	
PATIENT TABLE:	
a.	The Table should be fully motorized; with computer controlled table movements in Vertical and Horizontal directions.
b.	A CCTV system to observe the patient should be provided.
c.	There should be a hand held alarm for patients.
e.	The system should acquire motion artifact free images in T2 studies of Brain in restless patients (Propeller, Multivane, Blade etc)
f.	Dynamic Study for Pre/Post contrast Scans and time intensity studies.
g.	MR Angio Imaging: should have 2D/3D TOF, 2D/3D PC, MTS and TONE , real time interactive Imaging, 2D/3D fast field echo/balanced/steady state Techniques.
h.	Breast Imaging Package (with bilateral Breast Imaging Protocols).
i.	Perfusion Imaging of Brain and Breast with software for analysis.
j.	Susceptibility Weighted Imaging (i.e SWI) / Venous BOLD Imaging.
k.	Multi direction DWI and DTI (Complete package including quantification and Tractography Software).
m.	Internal Networking within the site to local Computer systems to be provided. ceMRA, facilities for accelerated time resolved Vascular Imaging with Applications like treats/tracks/tricks sequences.
n.	Fat and Water excitation Package. Diffusion weighted imaging, with b-value of 5000 or more.
o.	Bolus Chasing with automatic and manual triggering from Fluro mode to 3D Acquisition mode with moving table facility.
q	Whole Body Screening (at least 140 cm) Imaging studies for Metastasis with the help of Surface Coils should be possible for higher resolution.
r	Whole Body Diffusion Weighted Imaging with background suppression.
s	High-resolution Abdominal and Liver Imaging in breathold and free breathing modes with respirator triggered volume acquisitions.
t	The system should have basic and advanced MRCP Packages including free breathing and 3D techniques.

u	The system should have the Hydrogen, Single Voxel Spectroscopy, Multivoxel, Multislice and Multiangle 2D, 3D Spectroscopy and chemical shift imaging in 2D/3D. Complete processing/post-processing Software including color metabolite maps should be available on main Console. Complete Prostate Spectroscopy hardware and applications should be provided. Note : Breast and Prostate Spectroscopy should be part of standard package.
v	Advanced Cardiac Applications: VCG gating, Morphology/wall motion; Cine Perfusion Imaging; Myocardial viability Imaging; Arrhythmia rejection techniques, Advanced Cardiac Ventricular measurement analysis, Cine.
w	Parametric mapping of Cartilage to be provided . MAPit/ Cartigram/ Cartilage assesment to be offered.
10 WORK STATION:	
a.	A Workstation from the Manufacturer with preferably the same user interface as of main console is required with the availability of all necessary software including:
	Basic post-processing software including MIP, MPR, surface reconstruction and volume rendering technique.
	Advanced post-processing offered application including perfusion quantification advanced diffusion and DTI, including perfusion analysis, processing of 2D/3D CSI data, with color metabolite mapping & Flow quantification.
b.	It should have at least 19 inch LCD TFT Color Monitor, with hard disk of at least 100 GB for at least 250,000 image storage in 256 matrix, and 4 GB RAM capacity or more, with self playing DVD/CD archiving facility.

c.	The Workstation should enable printing in Laser Film Camera and Color Printers.
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11 SAFETY FEATURES: The safety features are of paramount importance to us.	
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a.	The System should include an Emergency Ramp Down unit (ERDU) for fast reduction of the magnetic field with Ramp Down time below 3 minutes.
b.	The Magnet should have quench bands that contain the fringe fields to a specified value in the event of a magnet quench.
c.	Real time SAR calculation should be performed by software to ensure that RF power levels comply with Regulatory Guidelines and are displayed on each image.
d.	The system shall have manual override of the motor drive for quick removal of the patient from the Magnet Bore.
e.	Temperature sensor (built in) for magnet refrigeration efficiency must be provided.

12 DOCUMENTATION:	
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a.	DICOM compatible Dry Chemistry Laser Camera with integrated processor for filming from Main Console & Workstation.
b.	Printing on Films of 14"x 17 size with a resolution of 500 or more dpi. It should be possible to connect other Digital Imaging Modalities to the Printer.

13	
UPS:	
a.	The system should be provided with UPS for the complete System with at least 15 minute back up.
14	
SUITABLE RF ENCLOSURE:	
a.	RF Cabin: The system should be supplied with the imported RF Cabin with RF room shielding, RF Door Screen and interiors for the same should be carried out suitably.
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ACCESSORIES:	
a.	Hand held metal detectors – 1 No.
b.	Non-magnetic patient trolley & wheel chair– 2 Nos.
c.	X-ray LED View box – 4 film viewers – 4Nos.
d.	Color Laser Jet Printer – 1 No.