



महावीर वात्सल्य अस्पताल

(महावीर मंदिर, पटना द्वारा संचालित)
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दूरभाष : 0612-2275657 / 2277529

Tender Notice

Mahavir Vaatsalya Aspatal, near L.C.T. Ghat, Mainpura, Patna, a hospital conducted by Mahavir Mandir Mandir, Patna invites sealed tender for supply of various medical equipments from reputed supplier / manufacturer/ dealer / firm/ company etc. as per terms and conditions as indicated below:-

Important Dates:-

Last date of submission of sealed tenders : 27.09.2015

A. Technical Specifications for High End 4D (Live 3D) Echocardiography System

Description

Latest generation high end & Technologically advanced Digital Live 3D Echocardiography system for all adult, pediatric, fetal and TEE cardiac applications

System should have: X Matrix probes suitable for both 2D and 3D in the same probe.

System should have minimum 40 lakh digitally scalable channels for simultaneous formation, acquisition and processing of multiple ultrasound beams and has a system architecture to process an entire bandwidth of frequencies from 1 MHz to 15 MHz System should support pulse coding and pulse shaping technologies.

Please mention number of digital channels in technical bid and highlight same in specification sheet.

System should have a dynamic range of minimum 280 DB so that variety of patient sizes can be handled without compromise. Please mention dynamic range in the technical bid with supporting specification sheet.

System should have high Resolution 2D Imaging, Colour Flow Imaging, M Mode, PW Doppler, CW Doppler, and Duplex & Triplex Modes. The probe must support a minimum of 2200 elements for exceptional 4D (Live 3D) image quality with all softwares.

System should have good Tissue Harmonic Imaging for improved Image quality.

System should have the state of the art Transmit Real Time Compound Imaging Technology with Multiple transmitted lines of sight, wherein Images from different viewing angles are obtained and combined into a single compound Image at real-time frame rates for improved visualization & better Image quality in Vascular Imaging & to virtually clean up the Image of artifacts.

System should have advanced Image Processing algorithms to analyse between targets and artifacts so as to sharpen target anatomy and reduce the speckle & artifacts for improved Image quality.

System should have extended field of view imaging of structures, by continuously scanning & moving the Probe over the area of Interest.

System should have advanced Tissue Doppler Imaging with high frame rate acquisition of more than 300 frames per second.

System should be able to perform advanced quantification measurements like Strain & Strain Rate Quantification. Speckled tracing (2 D / 3D) and capable of doing dyssynchrony study. Complete contrast ECHO package and all available advanced feature with option of upgradation in future.

Should measure the myocardial velocity and derives the strain rate and strain along user defined M-lines, Capable of drawing up to 3 M-lines at a time, Capable of sub-dividing each m-line into 8 sub-regions or according to user-defined sub-region sizes, Point of Interest tool obtains value from any point on the M-mode display.

2D based directional strain feature, providing the ability to define unlimited directional chords, track any area of the image and compute the percent of the wall deformation for each corresponding chord. It should be an easy, quick and accurate Strain method- Off line.

System should have great ergonomic design, with touch control panel, which is comfortable and convenient to avoid user muscle strain & stress injuries. Preferably a lightweight system should have a minimum of 17 inch & above Monitor, preferably a Flat Panel type.

Should have on-board workstation for storage and review of all exams, 2D, 3D Images, loops, etc. One offline workstation with similar capabilities of on-board analysis and quantification of 2D should be offered.

System should have DICOM 3.0 print and store features. Images (including cine loops) should be in standard DICOM format, which is compatible for transfer and review in existing workstation.

System should have inbuilt Image Management facility with facility for direct storage of Images and loops in the Hard Disk Drive and also thumbnail review to view & edit Images, loops and also reports.

System should have storage facility of images, loops in the hard disk drive of 160 GB or more.

System should be able to transfer Images & clips to CD & DVD media (cine loop, one at a time as desired).

System should Support 4D Strain, Mass and EF.

System should support Bulls eye Strain in Ectopic and AFIB Patients also.

Automated cutting and cropping should be available.

Offline M Mode with 360 Degree of Rotation should be possible.

System should support Live 3D, X- Plane and Live 3D colour capable of supporting Live 3D matrix Transducer (adult and Adult TEE).

All customized quantification and analysis package for M mode, 2 D, Doppler, Tissue Doppler, Strain imaging, Speckle tracking and 3D distance, volume etc. Should be offered with the following:

Adult 2D Echo Doppler Transducer with frequency ranging from 1-5 MHz

Live 3D X matrix probe preferably 1 to 5 MHz for both 2D and 3D application on same probe.

Pediatric Echo Transducer with frequency ranging from 3- 8 MHz

Live 3D Echo Matrix Transducer for TEE 2D, Live 3D, Live X Plane, Full Volume and 3D Colour (One Probe) applications with frequency range from 2-7MHz.

Linear probe for vascular applications with frequency range 5-12 MHz

Fetal echo curved linear probe 1-6 MHz

Integrated Stress Echo.

Latest Pentium PC (off-line workstation: 1 no) with software for analyzing and quantification of 2D data sets, (Strain, Strain rate, Colour Kinesis etc) CD writer with Image Management Software and colour laser Printer. PC should be offered with a flat panel display monitor.

2MHz continuous wave Doppler probe

Complete myocardial contrast perfusion and imaging software.

Complete myocardial contrast echo package (Myocardial perfusion & LV vol. Assessment)

TEE probe stand

Note: Any equivalent technology of validated, approved and proven quality will be considered any equivalent feature of proven quality, validated for clinical application will be considered.

ECHO Machine Must be US FDA and CE approved.

B. EQUIPMENTS FOR CATH LAB:

- Cath Lab Console with all accessories (monitor, table, C-arm)
- IVUS 1
- FFR 1
- IABP 1
- Cardiac monitor with all accessories 1
- Defibrillator 1
- Syringe pumps 2

- Dual chamber pacemaker 2
- Crash cart trolley with accessories 1
- ACT Machine 1 (cath lab/ ccu)
- Portable echo/ usg machine for cath lab, ccu, inside hospital 1

CATH LAB SHOULD BE

- Flat panel in type
- With Digital Subtraction Angiography and road map (suitable for neuro and peripheral intervention)
- With Fluro store
- With Stent boost or equivalent
- With Vessel Quantification Analysis
- With reduced radiation dose/ safety
- With good image quality
- With heart sweep or equivalent software
- With hemodynamic monitoring
- From reputed companies (US-FDA approved e.g.-GE, Seimens, Philips etc)
- Electrophysiology upgradable
- With C Arm for angulation and head to toe coverage of patient without position change
- Patient table with motorized movement and rotating facility
- CD/DVD archiving facility should be available
- Additional DICOM workstation for image review and storage, CD/DVD burning to be provided

Essential accessories:

1. Full backup UPS
2. Injector
3. Hemodynamic monitor
4. Laser printer
5. Lead glass
6. Lead apron and thyroid shield 8 each

Tender Technical Specifications of Single Plane Cath Lab

Expected function of the System - Dedicated flat panel detector angiography system with DSA for all angiographies and interventional procedures (cardiac/peripheral). The system should be the state of the art model to be quoted with feature equivalent to the latest model launched .

Floor/Ceiling mounted single plane Flat Panel Complete cardiac Angiography Machine with at least 25 minutes complete system UPS back-up.

Features: The system should be a fully integrated imaging system

The system should have a wide range of clinical application for interventional and diagnostic imaging with excellent image quality, extensive real-time processing, and innovative dose management, ease of positioning, improved workflow and image management for excellent clinical versatility without compromise

Technical Specifications

1. Gantry

- i) The system should have floor mounted/ceiling suspended gantry.
- ii) It is desirable to have full body coverage. (head to toe)
- iii) It should be possible to pre-programme the gantry for multiple examinations positions.
- iv) All movements of the gantry including collimator should be motorized and controlled from the table side.
- v) The system should have adequate collision protection for the safety of the patient.
- vi) Gantry should have fast speed for angulations and positioning have a speed at least 15- 20 degree/sec or more.
- vii) Gantry angulations should be freely user selectable to satisfy clinical imaging needs. Gantry should have automatic positioning capability dependent on the reference imaging being selected. RAO/LAO Angle should be for at least +/- 110 degrees. Cranio/Caudal movement should be at least +/- 45 degrees. Isocentre to floor distance for frontal C arm should be at least 105 cm.
- viii) Variable focal spot-to-detector between 90cm and 120cm. Distance and speed up to 9cm/s or more.

2. PATIENT ANGIOGRAPHY TABLE

- Floating/Floor mounted with carbon fiber tabletop with easy patient transport capability for all Angiographic Examinations and Interventions.
- Table Length- 280cm or more.
- Table Width- 46cm (18") or more.
- Horizontal Floor Movement- Eight Ways.
- Longitudinal Travel- 100cm or more.
- Fluoroscopic Coverage- 123cm or more (head to toe).
- Facility for bolus chase must be there.
- Transverse Travel- ± 14 cm.
- Vertical Travel- 30cm.
- Table Top Rotation- $\pm 180^\circ$.
- Table Load- At least 200kg of patient weight or more.
- Vertical Speed: 2cm/s@50Hz.
- Accessories for the table should include head fixing aids, mattress, four radiolucent carbon fiber arm supports, drip stand, peripheral filter set and catheterisation arm support for radial procedures.

3. X-RAY GENERATOR

- Generator should be microprocessor controlled multi pulse/high frequency for constant output with automatic dose rate control for radiography and fluoroscopy.
- Max power at least 100 KW. Maximum KVp at least 125 KVp.
- Radiographic KVp range to be 40-125 KVp or more. Fluoroscopy KVp range to be 60-120 KVp or more. Output at 100 KVP to be 1000 mA or more.
- Should have automatic exposure control device for radiographic fluoroscopy and angio mode.
- Should have an overloading protection.

4. X-RAY TUBES:

Tubes should be supplied with preferably liquid bearing tube technology or other performance proven tube technology like Grid Switched tube for silent efficient and long lasting function.

- i) The focal spot should have the following size:
 - a) 1mm or less with load 75KW or more
 - b) 0.6mm or less with load 30KW or more
- ii) Anode heat dissipation should be 5500W or more
- iii) X-ray tube should have secondary grid switching to reduce the soft X-ray to patient and Cardiologist/Operator.
- iv) At least 3 selectable programmable cu filters for reducing the dose to the patient
- v) Anode heat storage capacity should be 2.4 MHU or more having liquid bearing technology or metal lubricant or equivalent performance. The system should have adequate cooling facility for the X-ray tubes for uninterrupted performance during procedure.
- vi) Tube must have very high heat dissipation rate and effective filtration to reduce patient dose significantly. Models having Highest heat dissipation to be offered.

5. COLLIMATOR:

Collimator should have facility for copper Pre filtration for reducing the X-ray dose. Facility for asymmetric collimation will be an added advantage and will be preferred. The collimator leads should have IRIS type arrangement. The collimator should have the facility for dose measurement chamber in order to display the skin dose on the monitor in the lab.

6. FLAT PANEL DETECTOR FD 20x20

Equivalent to minimum 10 inch diagonal

- i) Flat detector should be made of Cesium Iodide Amorphous silicon photo diode scintillator or similar material, ideal for excellent High-resolution 1024x1024 image matrix or more to achieve a resolution of 2.5lp/mm or higher in routine use.
- ii) High speed fiber optic connection to the imaging system.
- iii) Integrated temperature stabilizer.
- iv) Integrated collision protection with removable grid.
- v) Detector rotation landscape/portrait selection with vertical display.
- vi) Pixel size 200 microns or less.
- vii) Detector size should be 24cm diagonally or more with at least 3 zoom fields, the smallest being 11 cm or less.
- viii) Maximum acquisition speed from 05 up to 30 images/sec or more.
- ix) Digitalization depth 14 bit or more.
- x) Spatial resolution of the detector 2.5LP/mm or more.
- xi) Detector quantum efficiency (DQE)>70% (at 0LP/mm) or more.
- xii) Control room should have antiglare provision with high resolution display in the control room.

xiii) Stent visualization software: The software and hardware for visualizing stent (stent enhancement capability) with extra high-resolution from table side control.

7. IMAGE DISPLAY MONITORS

- i) Two LCD/TFT flat 19 inch Monochrome Monitors with wide -viewing angle, high luminance, high contrast, flicker free, distortion-free: one for live image & one for reference.
- ii) 1 display monitor for Live/Ref Display – monochrome in console
- iii) One additional color monitor for displaying 3D electro anatomic mapping (CARTO/onsite) images or other external devices like 3D rotational angiography, IVUS, Echo display etc.
- iv) One additional color monitor for hemo dynamic display.

Total of 4 Monitors in Examination room.

Monitors in the examination room should be ceiling-suspended with height adjustment and longitudinal travel to either side of table & Swivel capabilities. All monitors may be incorporated into a single suspension frame. Monitor brightness should be at least 600 cd/m². Any additional feature to switch various video signals from various sources in a single monitor should be offered as standard.

OR

- In the Examination room- monitor should be ceiling suspended and it should be a single high resolution monitor of at least 56" and 8 megapixel resolution with PIP facility to display live and reference image from each plane, hemodynamic monitoring, 3D image and CT imaging, IVUS and OCT imaging. One medical grade backup monitor to be provided in exam room, console room and review station(outside lab)
- Ceiling suspension to allow free positioning at any location. Height adjustment should be possible.
- Control room: 2 high resolution LCD/TFT monitors of 17" or more for data and image viewing and to display 3D image. These monitors should have the facility for all review post processing and quantification of coronary and ventricular function for training and teaching.

8. ROTATIONAL ANGIOGRAPHY

- i) Rotational Angiograph for coronary & pediatric angiography
- ii) Rotational speed 30 degree/s or more
- iii) Rotational angle 90 degree or more
- iv) Frame speed 12.5, 15/25, 30 FPS.

9. DIGITAL IMAGE PROCESSING SYSTEM & WORK STATION

- i) Cine loop & image hold during fluoroscopy, pulsed fluoroscopy with frame rates of 15/30 images at 1024x1024 matrix/12 bit resolution.
- ii) Advanced image processing for real time edge enhancement, real-time harmonization & noise reduction.
- iii) Digital system with acquisition & processing in 1K matrix at 25/30 FPS.
- iv) Minimum storage capacity of 50,000 images or more in 1024x1024/12 bit resolution. Specify max capacity for hard disk.
- v) Background transfer of images from cath lab to digital storage/CD archiving without interruption of

cathlab procedure. (preferably automatic)

vi) Ability to display images back to cath lab.

vii) Image processing features like zoom, post processing.

viii) Both on line & off line coronary analysis & ventricular analysis from table side & console room.

ix) True on line Digital Subtraction facility at selectable frame speeds. Specify system capability for on line DSA and frame rate per second.

x) Facility to measure & display X-ray dose delivery during procedure.

xi) DICOM 3.0 or more based CD/DVD recording; CD have embedded software for instant review in any PC. Should have ability to run DSA run on CD. Facility to achieve multiple patient angiograms on single CD

xii) Clinically validated QCA for control & exam room.

xiii) Desirable: Storage and display of dynamic fluoro sequences: Eg. 10 sec at 30 p/s.

xiv) Desirable: Digital Subtraction Angiography in real time at variable frame rate specify.

xv) Latest stent visualization features like stent boost.

xvi) Image inversion facility for live procedures.

xvii) Desirable: heart sweep or equivalent for low dye angio in renal dysfunction.

xviii) Road mapping and landscaping facility should be available. It should have software for 3D image reconstruction of vascular structure, left atrium and aortic arch. The softwares for simultaneous display of 2D/3D ECHO and CT fusion over live angiographic images should be available.

xix) Complete cardiovascular computation software package. This should include clinically validated coronary, ventricular quantification software packages (QCA, LVA).

10. HEMO-DYNAMIC RECORDER

i) 12 channel EKG waveform display.

ii) 2or more invasive pressure display and necessary transducers, connectors.

iii) dP/dT waveform display.

iv) Spo2, Noninvasive BP display and necessary equipment.

v) Storage of ECG/pressure recording on CD.

vi) Storage on hard disk: specify storage capacity.

vii) One LCD/TFT monitor in examination room with ceiling suspension and one in console.

viii) Desirable: Conversion of homodynamic reports into DICOM3 Compatible image data format.

11. ACCESSORIES:

i) Lead window 150x100 cms 1 (imported good quality).

ii) UPS with 30 Min back up for the whole system.

iii) Focused ceiling mounted cool light of high quality with a handle for positioning the light. This handle should be removable.

iv) Console room chairs 4 and tables (as per user).

v) Console room and review station in the cath lab with computer and DVD/CD writing facility and DICOM print output.

vi) Wireless remote communication with operators from outside.

vii) Foot switch for fluoroscopy and acquisition to be provided.

viii) State of the art Pressure injector with precise flow injection with 200 sets of consumables.

ix) Ceiling suspended radiation shield.

- x) Lead aprons: of standard state of the art make, light weight, with a lead equivalent of 0.5 mm. Should be double sided, 8 such aprons to be provided 2 of which should be two piece and 6 should be single piece. Design should be wrap around. Lead glass of 200 x 200 cm to be supplied(As per international radiation protection standard).
- xi) Thyroid guards: 4 to be provided.
- xii) Lead Spectacles: 2 to be provided.
- xiii) Lead lined gloves: 1 pair to be provided.
- xiv) Laser printer.
- xv) Upper and lower body radiation protection – 1 each.
- xvi) Arm rest – 1 pair.
- xvii) Computer Work station to cut CD for giving to the Patient – 1 no.

NB: Should have US FDA/ Euro CE approved & AERB NOC
Suitable servo voltage & frequency stabilizer for whole system

Warranty for the full system: Minimum 1 years from the date of installation commissioning and handing over of the equipment to purchaser

C. ECHO Portable

One light weight portable USG machine/ color doppler/ ECHO for cath lab, CCU and all indoor purpose with one adult cardiac one convex and one vascular probe suitable for cardiac, abdominal, gynaecological, paediatric and neonatal use.

D. TECHNICAL SPECIFICATIONS for IVUS

IVUS	
S. No	System Technical Specifications
1	The system should be the latest generation of Intra-vascular ultrasound for 360° image evaluation of coronary lumen
2	Should be a Windows based system capable of accepting phased array and/ or mechanical transducer technology
3	Should be DICOM-3 compatible
4	Should have DICOM storage to CD-R and hospitable network compatible Compatibility with 20 MHz and 45 MHz catheters for coronary procedures
5	Should be accompanied with Flat Panel LCD $\geq 17/ 19$ " high quality monitor with keyboard, trackball and mouse or with touch pad
6	Data entry should be possible by keyboard and/or touch screen Hard disk storage space should be sufficient to store at least 20 clinical case studies
7	Should have ECG input on screen
8	Multiple image screen format
9	Availability of automatic and manual measurement of all essential parameters like diameter and areas. Multi-screen format for comparison with prior measurements

10	Should have digital video loop storage with still frames (JPEG) with full editing capabilities including offline editing.
11	Digital Video loop storage: upto 8 minutes with still frames (Jpeg) with full editing capabilities including offline editing
12	Should have automatic border detection, both lumen and vessel
13	Should have on-line 2D longitudinal display and measurements (seen as longitudinal cut section of the artery) as well as cross-sectional imaging
14	Should be capable of incorporating coronary angiographic system (i.e. Co-registration)
15	Should be capable of fully integrating within the Cath-lab systems
16	Should have advanced features like Virtual Histology; Chromaflo or equivalent etc.
17	Should be capable of being upgraded to advanced features such as FFR in future, within the same system
18	Input power: 200 – 240 VAC; and 50/60 Hz
19	Accessories: Printer color (01 No.) CD/DVD Writer Built-in IVUS catheters - 5 Nos. 0.014 guidewire compatible Reusable pull-back device
20	Optional: Clear visualization of blood flow, improved detection of blood flow; dissections, stent apposition etc. Color distinctions for plaque composition or colored tissue map. Should have up gradable software and network connectivity Compatibility with Coronary, Peripheral and Intra Cardiac Catheters.
21	Prices of all accessories like pull back device; IVUS catheters etc.to be quoted separately for future purchase
22	Training of the departmental staff on-site will be required
23	System should be US FDA approved

E. FFR (Fractional Flow Reserve) measurement system specification for Console

FFR	
S. No	System Technical Specifications
1	Should be accompanied with Flat Panel LCD $\geq 17''$ high quality monitor with keyboard, trackball and mouse or with touch pad
2	Data entry should be possible by keyboard and/or touch screen
3	Hard disk storage space should be sufficient to store at least 20 clinical case studies
4	Should have ECG input on screen

5	Multiple image screen format
6	Optional: Capable of being upgraded to iFR (Instantaneous wave-free ratio) technology in future - FFR correlated ratio without the need to inject hyperemic agent “Adenosine”.
7	Should be able to do FFR, iFR with the same equipment and wire.
8	Capable of incorporating IVUS within the same system as FFR
9	Capable of being upgraded to iFR Scout within the same system, to measure multiple lesions within a single vessel to assess the significant stenosis to treat.
10	Should be compatible with high quality photo printer, DVD, USB memory stick and DICOM networking
11	Should be able to asses distal Pressure through device.
12	Display both real time pressure and mean pressure values.
13	Should give Graphical presentation of pressure waves.
14	Should be operator friendly, guide steps to follow for procedure.
15	Should have memory to save and record the data
16	Allows analysis of recorded data through software.
17	System should be US FDA approved
18	Training of department staff on-site will be required
19	Should assess FFR, IMR and CFR with the same equipment
22	Training of the departmental staff on-site will be required
23	System should be US FDA approved
24	Accessories: Printer color (01 No.) CD/DVD Writer Built-in FFR WIRE -10 Nos.

NB: COMBO SYSTEM WITH FFR/IFR AND IVUS CAN BE QUOTED