REQUEST FOR BUGETARY ESTIMATE

Ref.: HSCC/SJH/Med. Eqpt./01 Dated: 26.05.2022

HSCC (India) Ltd. intends to invite On-line bids from eligible bidders, in single stage two bid systems for supply, installation, testing, commissioning & handing-over for the following make in India items for Safdarjung Hospitals in Delhi:

Sr. No.	Name of Items	Qty. (Nos)	Departments
1	EBUS	01	Respiratory
2	Rigid Bronchoscope	04	Respiratory
3	Video Bronchoscope	02	Respiratory
4	Hemodialysis Machine SLED with Portable RO	01	Respiratory
5	Ultrasound Cum Echo Color Doppler	06	Anaesthesia& Respiratory
6	Defibrillator Monitor with Recorder	01	CTVS
7	Angiography System for Interventional & Hybrid Procedure Including TAVI	01	CTVS

As per Govt of India Notification, if any of the above items are exempted from " Make in India", then firm having items of foreign origin may also submit their offer

The Technical Specifications are attached at Annexure-I. The equipment should have 5years warrantee.

It is requested to submit the Budgetary Quotation in Company Letter Head, as per the single page format enclosed at Annexure-II, in both Hard & Soft Copy within 10 days of issue of this Notice at following address:

General Manager (Project)
HSCC (India) ltd.,
E-6(A), Sector-1,
NOIDA (U.P.) – 201 301.

Soft copy may also please be sent on following e-mail ID:

pk_bhatia @hsccltd.co.in
t_nath@ hsccltd.co.in
pc_jena@hsccltd.co.in

GM (Project), HSCC (I) Ltd

ANNEXURE-II

Ref.: HSCC/ SJH/Med. Eqpt./01 Dated: 26.05.2022

BUGETARY QUOTATION

1)	**Sr.**		
2)	**Name of Item:**		List as per attached Specifications at Annexure-I
3)	**Model No.:**		
4)	**Name of manufacturer**		
	Address:		
5)	**Contact Details of the Firm submitting**		
	Budgetary Quotation:		
6)	**Budgetary Cost of Equipment:**		
	The Budgetary Cost of Equipment includes the following:		
	1)	All Taxes & Duties on FOR India basis.	
	2)	Insurance till installation.	
	3)	Inclusive of 5 years Warranty.	
	4)	Delivery & Installation - within 60 days from the date of issue of Purchase Order	
	5)	Cost inclusive of 3rd Party Inspection by reputed Agencies	
	i.e. SGS / Llyod / TUV / Bureau Veritas		

NOTE:

1. Please enclose a copy of Last Purchase Order for the same Model (preferably from a Govt. Institute).

2. Copy of Catalogue / Brochure / Product Data Sheet etc to be submitted.

(Sign & Stamp of Firm)

SPECIFICATION OF ANGIOGRAPHY SYSTEM FOR INTERVENTIONAL & HYBRID PROCEDURE INCLUDING TAVI.

State of the Art, Single plane **Multidirectional Floor with articulated arm /Ceiling C-arm** with multiple parking positions with Z axis movement and embedded with Latest flat detector digital imaging system and dedicated OR table for various Interventional and Cardiac Hybrid procedures including TAVR, EVAR, TEVAR in Hybrid OR environment. The **Multidirectional Floor/Ceiling C- Arm should be able** to be park away to create the free space all around the table during Open cardiac surgery.

Any update launched prior to the installation of the equipment should be part of the supply, even if not quoted at the submitting the bid. The detailed specification that follows shall be understood to be minimum requirement. However, additional relevant technical features suitable for our requirement will be given due weightage

A) Multidirectional Floor/Ceiling C-Arm

1. All movements should be motorized with C-Arm angulations of minimum RAO/LAO+115 deg. /-105 deg. CRAN/CAUD + - 40 deg.
2. At Head End- Gantry Speed should be 20 deg/sec for LAO and RAO, and Angulation speed should be 15 deg/sec for Cranial and Caudal. These gantry Speed should be achieved from gantry side position as well.
3. The System should have user defined 50 or more programmed position.
4. Motorized parking of C-Arm to be away or left or right of the table during open surgery on table when C- Arm not in use.
5. The C-arm should have auto collision protection with patient and the table.
6. The C-arm should provide head to toe Coverage
7. C-arm must not interfere with laminar airflow during surgery and accommodate planer of min size of 2400 mm x2400 mm
8. OT lights on ceiling should be connected with long arm and focused on table at surgery site.
9. Pendants and OT lights should not Collides with C-arm movements.
10. System should have 2K imaging in acquisition and processing.

B) OR TABLE: - Dedicated OR Table

1. The Proposed OR Table should be One Float carbon fibre and universal operating table Top with Modular exchangeable table tops.
2. The modular exchangeable table top system should consist of a Floor Mounted Operating with connection for Network & hardware Signals, with electrically motorized adjustment of height, tilt, Trendelenburg/Anti-Trendelenburg.
3. The Column & Table top functions can be operated via the column Keypad or Optionally via Cable or Wireless remote control or Foot Control, Column Cladding should be made of Stainless Steel.
4. Table top sections should be powered for enabling c-arm access
5. Full length radio-translucent top.
6. Table top should be made of carbon fibre, easy to clean surface
7. Achieving zero level position by pressing single button from the handset.
8. Maximum speed of Transverse & Longitudinal slide should be min 150 mm/
9. Should have maintenance-free battery integrated in the column or Instant Cable connection with fixed column.
10. CPR should be possible on the extended position of OR table.
11. Shuttle for carrying the Table Top should have running gear with four electrically conductive swivel wheels, should made of Aluminum & capable of carrying a weigh 360kgs or more.
12. Table should be supplied with basic table top and universal table top. Basic Table top(Carbon Float line) should be capable to perform all diagnostic and Intervention procedures whereas Universal Top should be fully capable to perform cardiac and vascular Open surgery.

Technical specs of Carbon Float Line table top: In Hybrid OR

One Part Operating Table top made of Carbon Fibre, with Electrically Motorized adjustment of Longitudinal & Transverse Shift with coupling point at the head end for attaching head positioning accessories. It should be radiolucent on working area. Should be supplied with Viscous Elastic pad with Velcro.The Carbon Table Top should allow a free-floating motion in the longitudinal & Transverse Displacement with a control Unit.

Trendelenburg/Anti-Trendelenburg	± 15 Deg or Higher
Lateral Tilt	+-25° or Higher
Table Top: Longitudinal Float range	800mm or More
patient weight in all positions	150kg - 200kg or more
Patient weight in zero position	150kg -250kg or more
Width across side bars	500 - 600 mm or more
Minimum height without tabletop	490 - 550 mm or more
Maximum height without tabletop	1040 - 1090 mm or more
Length	2250mm-3000mm or more

Technical specs of Universal Table Top: Cardiac, Vascular and General Surgery

Two Part Operating table top with Hook coupling point & Electrically Motorized adjustment of Leg Sections Joint, back section & Longitudinal shift. Viscous Elastic pad with Velcro.

Trendelenburg/Anti-Trendelenburg	≥ ± 45°
Lateral Tilt	± 30° or more
Standard leg section up/down*	+ 80° (up), -90°(down)
Back section up/down	+ 90° / - 55°
Table Top: Longitudinal slide	230mm - 350mm or more
patient weight	250-380 kg
Length	2055-2200
Width across side bars	500 - 600 mm
Minimum height without tabletop	500- 535 mm
Maximum height without tabletop	1020 - 1090 mm or more
Head section adjustment	+36/-50° or more
Flexion	100° - 140°

Accessories for CTV surgery with additional / universal table to-

- All accessories should be included with both the tabletops for Minimally invasive and open Surgical procedures.
- Table top carbon float line with carbon components.
- It should be provided with 2 shuttle systems with control for each table top I.e. for universal table top and carbon float line table top.

C) **X-RAY GENERATOR:**

1. 100 KW or more compatible with high resolution imaging
2. High frequency X-ray generator with automatic regulation of radiation dose rate for all fluoro for cardiac and DSA and acquisition imaging.
3. The minimum power rating should be 100 KW OR more at 100 KV compatible with high resolution imaging.
4. Fluoroscopy exposure in mA and kV should be automatically controlled.
5. Anatomical programming radiography, Fluoroscopy, acquisition should be available.
6. System should have pulsed fluoroscopy at variable rates for reducing the x-ray dose to the patient during intervention procedure.

D) **X-RAY TUBE:**

1. The X-ray tube should have Anode heat storage capacity of at least 5.0 MHU or more to run continuously for **10-12** hours without shutting off.
2. Tube should have High dissipation. Please give figures of heat dissipation rate.

3 **X-ray tube should be with a minimum of two focal spots (small & Large), preferably three focal spots. The small focal spot should not be more than 0.4 mm and large focal spot should not be more than 1 mm. The large Focus power output should be 65kW or more. The pulse Fluoroscopy should be offered with pulse rate of 3.75 Frame/sec to 30 frames/sec.**

4 **Latest generation tube, fluoroscopic power shall be at least 3000 watts for noiseless operation to support long term interventional procedures and for better visibility in obese (BMI> 35 kg/m2) and deep angulations with minimal dose**

E) **RADIATION PROTECTION:**

1 The system should have integrated computer-controlled X-ray Beam filtering with automatic/ programmable copper filters of various sizes from 0.2 mm to 0.9 mm or better.
2 The system should have positioning of collimator blades without radiation.
3 The system should have monitoring and display of X-ray dose during the patient examination. It should be possible to create a DICOM based dose report of the patient.
4 System should meet all National & International safety standards and comply with BARC & AERB guidelines- AERB NOC or Type approval is mandatory
5 System should achieve the Lowest dose levels either with software and hardware
6. All vendors should quote the top of the line dose reduction features

F) **DIGITAL IMAGING SYSTEM:**

1. A Latest flat detector with a diagonal size of least 46 cm with 16-bit digitalization depth.
2. Digital system with acquisition and processing in 1024 x 1024 matrix at 25fps with12 bit digitization.
3. Image storage capacity of at least 50,000 images in 2K matrix at 10/12 bits on the main system disk and upgradeable further.
4. 2k Imaging should quote as standard.
5. System should have capability of ECG display on the live image monitor during the angiography.
6. System should have on-line & off-line validated cardiac and vascular analysis. The software should have Auto calibration facility for stenosis measurement with geometrical and densitometry calculations. The analysis should be possible from table side in the examination room and from the control room.
7. The full system should have table side control operation with touch screen / knobs for complete acquisition and post processing capabilities.
8. The system should have on-line DSA capabilities with acquisition frame rate of 1 frame/sec to 6 frames /sec or more.
9. The system should have facility for storage of fluoro loop scene of at least 10 seconds, preferably 20 secs.
10. System should be provided with all advanced 2D and 3D road mapping.
11. The latest complete software and hardware for visualizing stent from table side control & stent enhancement with relation to lumen (fade in and fade out).
12. Separate/**Integrated** 3D work station should be provided with at least 3 GB main memory for 3D reconstruction to free the main system for continuation of procedure immediately after displayed both in the control room as well as the examination room. It should be possible to recall & view images acquired in the rotational mode (subtracted &un subtracted) alongside the 3D images. Review of all images should be fast interactive & user friendly in both the rooms. Table side controls for 3D reconstruction and C-Arm positioning with respect to 3D image & selection of 3D image with respect to C-Arm positioning should be provided. The 3D reconstruction should be in true 512 matrix.

The 3D workstation should be capable of the following functions:

i) 3D reconstruction using SSD, VRT, MIP in true 512 matrix with color display in the control & examination room.
ii) All post-processing functions for images including fusion of CT, MR and angio images with 3D display & 3D volume measurement.
iii) Immediate background transfer of all images as soon as they are acquired, to CD/DVD recording station.
iv) It should be possible to have 3D of aortic root from the rotational angio data.
v) TAVR package should have auto marking feature of anatomical landmarks like coronary ostium. It should be possible to have overlay of live fluoro on this 3D

image for valve marking lines with landmarks for guidance in TAVI procedures. C Arm should position itself automatically go to projection view depending upon the reconstructed 3D image without additional fluoroscopy.

vi) 3D rotational Angiography should be performed from **three side positions** of C-arm (when head side is occupied with anesthetic).

vii) The system should have cross-sectional **CT like imaging / 3D rotational angio** for cardiac imaging. The 3D CT images should be of high resolution and high diagnostic quality for anatomies like aorta, Left atrium and Pulmonary veins etc.

viii) System should have software/hardware package for planning & guidance of valve implantation in TAVI procedure from rotational angiography data and pre acquired CT data.

ix) **System should have software/hardware package for guidance of Stent/Graft implantation in EVAR/TEVAR procedure from rotational angiographic data and CT/MR/3D fusion with fluoroscopy should be possible. Flow analysis and quantification pre and post procedure**

x) 2D and 3D Echo image Fusion with Live Fluoroscopy for Structural Heart Interventions should be possible

xi) System should have Automatic segmentation of the cardiac anatomy, aortic root and aorta after intraoperative 3D CT acquisition aligned /gated to the cardiac cycle.

G). MONITORS/DISPLAY:

1. Exam room should have Single large High-resolution Monitor- size of 55 inch or more to show Live, Reference, 3D, Hemodynamic, Roadmap and 2D workstation.
2. Control room should have multiple 19 inch or higher size monitors to show Live, Review, 3D and 2D workstation.
3. All Monitors in Exam and Control should be good quality high resolution monitors.

H). Hemodynamic Recorder specifications:

1. Dedicated hemodynamic system for cardiac catheterization for adult and pediatric patient.
2. Hemodynamic system should have four invasive pressures & ECG.
3. Should have all Hemodynamic analysis tools to calculate cardiac output, shunt area and Gradient measurements.
4. Should be able to store and print one-week angio-studies.
5. 12 lead ECG, 4 No.s invasive pressure connecting Leads and 10 Nos. Transducers and Domes should be supplied with system.
6. Network Printer for printing hemodynamic studies.

I). CONTROL CONSOLE:

1) All system movements of C-Arm, table, image display, image review, image post processing and quantification shall be controlled both by the operator at the table in the exam room and in console room.
2) The system should have facility for edge enhancement, Positive/negative image display, windowing, contrast/brightness, electronic shuttering, image/pixel shifting, vertical and horizontal image reversal, zoom functions. System should have facility to show roadmap and roadmap on acquired DSA Run.
3) The system should have fast and direct access to all series, single images, in both examination and control room.
4) System should have Quantitative Coronary analysis, distance measurement, Image labeling and patient positioning facilities.
5) All table side Modules should be available on Movable cart or pedestal.

J). DIGITAL ARCHIVING: -

1.System should be DICOM 3.0 ready.
2. Image transfer from digital system in background mode without affecting the system operation.
3. 20 personal dosimeters should be provided which will give real time reading of the radiation dose.
4. There should be a provision for display of time taken for interventional procedures in the operating room the dosimeter should have wired or wireless connectivity to the dose monitoring system for according the dosages and archiving

K) Training

Training to be provided to five doctors of the department for operation of the equipment for two weeks at any International site.

L) UPS: -

Suitable online UPS of at least 160 KVA capacities with 30 min. battery backup for complete Cath Lab including cine and fluoroscopy. Emergency lighting should also be on UPS.

M) ESSENTIAL ACCESSORIES TO BE SUPPLIED:

1. TWO state of the art High Pressure injector (one ceiling mounted and another mobile) of reputed make should be supplied, coupled with DSA system.
   (a) Ceiling mounted Injector-It should not interfere with movement of C-arm/L-arm. System should have programmed flow rate, volume, with variable pressure limits for all type of angiographies with disposable high-pressure syringes. It should be supplied with 500 Syringes (syringes to be supplied in staggered fashion as per departmental requirement). Unit price of each 50-syringe pack should be quoted in the bid and this will be valid for subsequent 10 years
2. Mobile injector- System should have programmed flow rate, volume, with variable pressure limits for all type of angiographies with disposable high-pressure syringes. The details of the make of the mobile injector must be provided. It should be Medrad Mark V Provis injector (or equivalent) with 150 ml syringe. It should be supplied with 500 Syringes (syringes to be supplied in staggered fashion as per departmental requirement). Unit price of each 50-syringe pack should be quoted in the bid and this will be valid for subsequent 10 years Lead glass at least 100 x 120 cm for console room to have complete view of the patient.
3. Ceiling suspended radiation protection-1 no. (as per international radiation protection system) and table side protection system
4. Over and under the couch mobile dockable lead shield system (MAVIG)
5. Ten zero lead aprons (wrap around skirt type) with integrated thyroid shields, Ten universal lead eye glasses, 10 lead caps, mid tall mobile x-ray barrier (2 No.), short mobile x-ray barrier (2 No.) and wall mounted aprons racks (6 apron)
6. Table mounted radiation protection -1 no. (as per international radiation protection system)
7. Integrated two-way communication system between control room and examination room.
8. A 6-channel monitor for ECG, Blood pressure, respiration, Sp02, and NIBP pulse oximeter. (Adult & Pediatric B.P cuffs) in the DSA room. One additional display unit should be available in the central console room for reviewing of all the vitals without entering the DSA room.
9. One laser Network Printer of high resolution (at least 1200 dots per inch) with minimum 128 MB memory and 1200 dpi
10. Dicom workstation for storing the patient data and recording data on CD and DVD.
11. Accessories for the table should include:
    i) Head fixing aids (n=2)
    ii) Chin support (n=2)
    iii) Carbon fibre radiolucent arm support (n=4)
    iv) Body straps (n=2) 47
    v) Shoulder harness (n=2)
    vi) Ankle restrainer (n=2)
    vii) Soft mattress (n=2)
    viii) Drip stands (n=2)
    ix) Peripheral filter set, catheterization arm support (n=2)
    x) Table top which can be positioned over patients legs for keeping procedure materials.

N) Site Modification (Layout attached)

1. Hybrid OT Area under the scope of the site modification is :-
   - Examination Room
   - Console Room
   - UPS cum Cabinet room
2. Examination room should be in line with AERB requirements.

3. Examination room to be extended Upon corridor area.
4. Point Deleted.
5. Point Deleted.
6. Lead Glass window and lead door to be provided on console and examination room common wall. Second lead lined door to be provided in the examination room for patient entrance.
7. Modification in OT room shall be allowed and done by vendor to make site feasible and fixing of Lead window frame and doors and other accessories etc.
8. PVC Flooring, trenches and cable trays to be provided.
9. Separate Air-conditioning of 3 x 2 TR (Split AC) to be provided in the UPS cum cabinet room & Console room.
10. Total load of the equipment along with the accessories to be mentioned by the vendor
11. Hospital authorities to provide electrical cable upto electrical panel in the UPS room
12. LT panel should be Supplied & installed by the vendor
13. All general lighting, electrical fittings and fixtures to be provided by vendor
14fire extinguisher for composite Hybrid OR The fire protection system must include high sensitivity smoke detectors and a fire panel.
15. Partition to be provided between UPS and Batteries in the UPS room
16. All civil works related to successful installation of the machine as per the layout and should be carried out by the vendor
17. Wall finishes in console and UPS room - POP and plastic emulsion paint up to the false ceiling.
18.Existing OT finishes to be retained even if few modification are required.
19. Filling of all joints and cavities with metallic epoxy filler and sander flush to provide a joint less finish and them sprayed with water based anti-Bacterial, Self-sterilizing point to a depth of 300 microns with primer.
20. Flooring seamless with perfectly curved flash-coving, resistance to mechanical stress and dynamic loads and having ESD /EMI protection characteristics, 2 mm thick, washable
21. Tile based and membrane type control panel, mounted flush in the theatre wall, comprising of the following:
    - 1 No. Day Time Clock
    - 1 No. Lapse Time Clock
    - 1 Set Dimmer for peripheral/plainer lights
    - 1 No. Hands Free telephone
    - 1 No medical gas status/ alarm
    - 1 Set indicator only for temperature and humidity display

22. Twin Plate X-ray viewing screen designed to provide a high level of control luminance without flicker. It will be equipped with eight spring-loaded clips to secure the X-ray negative when in use. The X-ray viewing screen illumination shall be high frequency fluorescent lamps, controlled by dimming ballast.
23. Supplying and fixing operating writing board size 840 x 640 mm complete with writing pens Scrubbing Pad etc. As reqd.
24. Recess mounted IP54 Protocol, non-hygroscopic peripheral lights having LED and sigma-digital ballast.
25. Return Air Grills
26. OT Electrical Internal Wiring and DB Box with MCCB for OT and 4 no's of 5/15 Amp electrical outlets on OT walls
27. Medical Gas Pipeline inside OT
28 Plain air Ceiling if required to be constructed out of 1.6 mm thick GI sheet of size 2400 X 2400 mm having 6 nos. of hepa filters. The hepa filter having dust spot efficiency of 99.99% 0.3 micron. Air & light diffuser made out of two layer of mono filament precision woven polyester for the plan air ceiling to give a "LAMINAR FLOW" of filtered air. Existing Air condition unit shall be used with required modifications.
29. Existing finishes of Laminar flow to be retained.
30. Sliding, hermetically sealing Motorized lead door of appropriate size having high density particle board cores high pressure laminated faced on both sides, viewing window 600 x 600 mm and for smooth effortless sliding, the doors run on nylon wheels within an aluminum extrusion track.
31. Storage cabinets to be provided inside the store room identified for Hybrid OR to store consumables
32 Storage cabinets to be provided inside the Hybrid OR

Furniture &Accessories:

a. Workstation table – 1 no.
b. Computer chairs on castors – 2 nos.
c. Providing fixing, supply and installation of SS storage unit of size (800 X 1900 X 300). The unit will be divided into 2 equal parts and each part will have individual glass doors with locking system. Each part will have glass rack to keep surgical medicines etc. -2 Nos.
d. Single Arm Anesthesia Ceiling Pendant – 1nos. if required after modification of OR

e. Surgical Single Arm Pendant. if required after modification of OR
f. Low Temperature H2O2 plasma sterilizer 90-100 L (according to usable volume)
   a) Plasma generation should be inside the chamber
   b) Cycle time between 45-75 minutes
   c) Should have recommendations (Instruction foe use) of reputed manufacture like Medtronic/St Jude etc.
   d) Sterilant cassette can be stored at room temperature with leak proof indicator
   e) Consumables, incubator and biological indicators for 100 cycles to be included
   f) Consumable should include sterilant, Tyvek packing material and chemical indicators
   g) Post-inserting the sterilant where should not be any time limit of use
   h) UPS of sterilizer must be supplied by the parent company
   i) Sealing machine should be supplied

g. Two No's Dual Dome High End OT light with long arm connector on ceiling. It should have:
   a) Both the domes should have 1,60,000 Lux each.
   b) It should have color temperature on min 4300 kelvin.
   c) The light dome should be SMPS unit
   d) Light should be fully equipped for Open Cardiac surgery.

SPECIFICATION FOR DEFIBRILLATOR MONITOR WITH RECORDER

1. Should be a Low Energy Biphasic defibrillator, monitor with Recorder, having capability to arrest all arrhythmias within a maximum energy of 200 Joules.
2. Should work on Manual and Automatic external defibrillation (AED) mode.
3. Should monitor ECG through paddles, pads and monitoring electrodes.
4. Should defibrillate through pads and paddles.
5. Should compensate for body impedance for a range of 25 to 250ohms.
6. Should be capable of doing syncronised cardioversion through pads.
7. Should also be capable of doing syncronised cardioversion through paddles.
8. Should have a built in 50mm strip printer.
9. Should have charging time of less than 7 seconds for maximum energy.
10. Should have liquid crystal display of min. 8 inches for viewing messages and ECG waveform of 5 seconds.
11. Should have external paddles with paddles contact indicator - for good paddle contact.
12. Should have Internal Paddles with shock button on Paddles.
13. It should have ability to measure chest compression Rate, chest compression Depth, Chest recoil, Idle Time for adult as well as pediatric with both visual and audible prompts.
14. It should have ability to filter out CPR artifacts and allowing clinician to see organized filtered rhythms without interrupting chest compressions.
15. The device should be supplied with integrated reusable electrodes/ pads with CPR sensor for CPR monitoring, defibrillation, ECG & external pacing capability.
16. Should have event summary facility for recording and printing at least 250 events and 50 waveforms.
17. Should have Configurable shock protocol, set up mode and auto self test.
18. Should have Configurable heart rate alarm limits for selection of on of the following limits: 30 to 100; 60 to 140; 90 to 160 and 120 to 200 bpm.
19. Should have facility to store patient data on data card typically more than 90 minutes of patient ECG & events.
20. Should have voice prompts on AED mode.
21. Should have sealed lead acid battery capable of usage for at least 150minutes or 100 discharges.
22. Should be capable of printing Reports on Event summary, configuration, self test, battery capacity etc.
23. Should have facility for self test/check before usage and set up function.
24. Should have facility for measuring SpO2.
25. Should have facility for Transcutaneous Demand & fixed mode non invasive pacing.
26. Should have future upgradeable to NIBP & EtCO2 monitoring.
27. Should be supplied with the following accessories:
    - Adult with Built in Paediatrics paddle - one pair
    - 3 lead ECG cable
    - Adult SpO2 Probe
    - Reusable Adult Pads or Disposable Adult Pads which can use for minimum 100 procedure.
    - Internal paddles Adult – One Pair
    - Internal Paddles Paed. – One Pair
    - Paper Rolls – 10 Rolls.

28. Remarks
    05 years warranty with 05 years CMC.
    Pre-bid meeting is required.

SPECIFICATIONS OF RIGID BRONCHOSCOPY

I. Type

a. The tracheal and bronchoscope tubes should be made of high quality stainless steel
b. The tracheoscope and bronchoscope tubes should be with/without a distal fiber optic light carrier
c. The tracheobronchoscope tubes should be of use with proximally insertable telescopes
d. The bronchoscopes should be durable and should be able to be cleaned with commonly used sterilizing solutions without affecting the surface of the scope
e. A dedicated trolley with heavy duty castor wheels with locking system with adequate shelf to keep the system and accessories for carrying the entire system and recording equipment should be provided
f. Operating voltage - Power 220 V, 50 Hz, AC

II. Accessories To Be Provided Along With Equipment

a. Zero degree straight forward viewing telescope with integrated fiberoptic light transmission,(4.5 mm diameter), and working length 500 mm, - 2 Nos

III. Tracheoscope

a. Tracheoscope tube size, 14 mm diameter, and working length 330 mm – 2 Nos

IV. Bronchoscope

a. Bronchoscope tube size,(14 mm diameter), 430 mm working length) - 2 Nos

V. Optical Forceps

a. Optical forceps, alligator,(2Nos)
b. Optical forceps, cupped jaws for biopsy,(2Nos)
c. Optical forceps, universal,(2Nos)
d. Optical forceps for removal of coins and flat foreign body, (2Nos)

VI. Manual Forceps

a. Manual forceps alligator, (2.5 mm diameter) (2Nos)& 50 mm working length) - (2Nos)
b. Manual forceps round cupped jaws for biopsy, 2.5 mm diameter & 50 mm working length – 2 Nos
c. Manual forceps universal, 2.5 mm diameter & 50 mm working length – 2 Nos
d. Manual forceps for peanuts and soft foreign bodies at least 50 cm length,(2Nos)
e. Foreign body basket with handle > 50 cm length,(2Nos)
f. Sponge holder forceps,(2Nos)
g. Cotton applicator forceps,(2Nos)
h. Insulated coagulation tube with connector for unipolar coagulation, (2Nos)
i. The system should be provided with a laptop PC (Windows 7 OS, 750 GB Hard disc drive, 8 GB RAM, Core i-7 processor)
j. Prismatic Light Deflector, (5 Pieces)
k. Glass window plug, (10 Pieces)
l. Movable adaptor with sealing cap, (5 Pieces)
m. Injection cannula for positive pressure ventilation, (5 Pieces)
n. Adaptor for respirator, (10 Pieces)
o. Instrument guide, (10 Pieces)
p. Rubber tipped suction catheter (4 mm) of at least 50 cm length with adaptor,(10 Nos)
q. Flexible suction catheters,(100 Nos)
r. Cleaning brushes, (5 Nos)
s. Carrying case for equipment, tubes and forceps -01 number each
t. Anti fog solution -30 ml-bottle, (15 Nos)

u. The bronchoscope should have a side port facility for ventilating the patient using standard anaesthesia circuit
v. All the accessories should be compatible with the sheath
w. All metallic instruments and accessories should be easy to clean and sterlize
x. The system should include accessories like, UPS, power cables, fiber optic cables connectors etc to make the unit fully functional

VII. The equipment should **(a)** be conform to the standards laid down by the Bureau of Indian Standards (BIS) and if not then device shall **(b)** conform to the standard laid down by the International Organization for Standardization (ISO) or the International Electro Technical Commission (IEC), or by any other pharmacopoeial standards and if not (a) or (b) then **(c)** the device shall conform to the validated manufacturer's standards.

VIII. **Additional Parameters details**

1. 4K Resolution Camera System should be provided : 4K resolution camera system capable of producing resolution of 3840 x 2160 pixels with 31 inch or more 4K resolution offering visualization modes by shifting colour spectrum like BLUE & GREEN light for tissue differentiation & picture-in-picture mode, LED 175 light source with lamp life of at least 30,000 hours, with facility to record 4K UHD still images & Full HD videos on external USB drive or medical grade recorder from the same manufacturer controllable with camera head
2. 12mm tracheoscope (33cm length) is acceptable instead of the 2nd 14mm tracheoscope.
3. Additional bronchoscopes (1 unit each) in sizes 12mm (43cm), 11mm (43cm), 9.2 mm (43cm)
4. Dilation Tracheoscope (12mm diameter, 33cm length) should be provided from same manufacturer with telescope with 4mm diameter & length 30cm for dilation tracheoscope is acceptable instead of 2nd 50cm telescope.
5. Silicon stent placement kit capable of placing stent of diameter 8 to 20 mm straight and Y shaped alongwith introducing tube, plunger stent loader and optical forceps for repositioning and removal of silicon stent for use with full lumen bronchoscopes.

IX. Demonstration, if required has to be given.

X. Five years of warranty followed by five years of CMC

XI. List of consumables to be given along with rates which will be freezed for five years

SPECIFICATION OF ENDOBRONCHIAL ULTRASOUND SYSTEM (EBUS)

1. **System includes**
   - I. Ultrasonic Broncho fibre Videoscope (for EBUS-TBNA)
   - II. Video processor and light source
   - III. Ultrasound Processor with Colour Doppler function

2. **Specifications:**

I. Ultrasonic Broncho fibre Videoscope (for EBUS-TBNA)

1) Field of view at least 80° (atleast 10° forward oblique)
2) Depth of field: Approximately 2-50 mm
3) Tip deflection: Up atleast 120° or more; down atleast 90° or less
4) Distal end outer diameter: atleast 6.6 mm
5) Insertion tube outer diameter: Atleast 6.2 mm
6) Instrument channel width: At least 2 mm
7) Working length: At least 600 mm
8) Acoustic frequencies: 5-12 MHZ switchable
9) Scan Direction: Longitudinal
10) Scan system: Convex
11) Scan Angle: 60° or more

II. Digital Ultrasound Scanner/ colour Doppler

1) Compatible with the above EBUS puncture scope
2) Hi support-automatically optimize the B mode, Pulse Doppler, High resolution flow, tissue Harmonic imaging, Elastrography
3) Picture in picture for both ultrasound and endoscopic image simultaneously
4) High resolution imaging
5) Ergonomic operation keyboard
6) User programmable calculation package
7) Annotation, arrow mark and point display
8) The whole system should function on 50Hz/ 220 VAC

III. Video processor and light source

1) 300 watts' xenon light source
2) Atleast one spare bulb should be supplied
3) Output to be HDMI/DVI/HD – HDI/ HD-SDI (any two available)

IV. Full HD Monitor

1) 24 inchs or more High Definition Monitor of Medical Grade. It should be mountable on trolley

V. Computer with Software

1) Should be supplied with suitable computer system with facility for recording images and video

VI. Trolley

1) Suitable trolley to mount monitor, scopes, light source and all accessories.

VII. Accessories

1) Supplied with 19 gauge TBNA needle (20 qty) which is certified to be compatible with the above mentioned scope
2) Supplied with 21 gauge TBNA needle (20 qty) which is certified to be compatible with the above mentioned scope
3) Balloons (50 qty)
4) USB with power backup of atleast 30 minutes

VIII. The equipment should **(a)** be conform to the standards laid down by the Bureau of Indian Standards (BIS) and if not then device shall **(b)** conform to the standard laid down by the International Organization for Standardization (ISO) or the International Electro Technical Commission (IEC), or by any other pharmacopoeial standards and if not (a) or (b) then **(c)** the device shall conform to the validated manufacturer's standards.

IX. Demonstration, if required has to be given.

X. Five years of warranty followed by five years of CMC

XI. List of consumables to be given alongwith rates which will be freezed for five years.

SPECIFICATION OF FLEXIBLE FIBER OPTIC VIDEO BRONCHOSCOPE SYSTEM FOR ADULT AND PAEDIATRIC

A. **Video Bronchoscope System**

B. **The flexible Fibre optic Bronchoscope should be supplied complete with light source and trolley and 21' medical grade Monitor**

C. **Adult Scope:**
   1. Field of View should be 120 degree or more
   2. Depth of field should be 3 – 100 mm or better
   3. Distal end diameter should be 6 mm or less
   4. Insertion tube diameter should be 6 mm or less
   5. Channel diameter should be 2.0 mm or more
   6. Working length should be 600 mm or more
   7. Total length should be 600 mm or more
   8. UP and DOWN Angulations should be 180 degree and 130 degree or better
   9. Can be fully immersed in disinfectant solution and water

D. **Paediatric Scope:**
   A. Field of View should be 100° degree or more
   B. Depth of field should be 2-50 mm or better
   C. Distal end diameter should be 3.8 mm or less
   D. Insertion tube diameter should be 3.1 mm or less
   E. Channel diameter should be 1.2 mm or more
   F. Should be light weight and easy to use
   G. Working length should be 600 mm or more
   H. Total length should be 600 mm or more
   I. UP and DOWN Angulations should be 180 degree and 130 degree or better
   J. Can be fully immersed in disinfectant solution and water

E. **FULL HD Video Processor & Light source**
   A. Outputs - RGB, Y/C, VBS Composite, XGA & DV simultaneous
   B. It should have structure and edge enhancement option for better image quality
   C. It should have various iris control option for better light distribution
   D. Unit should be compact and light weight.
   E. Air pump - Inbuilt air pump with minimum two variable air flow control.
   F. Lamp can be turned on/off without turning off the equipment.
   G. Capacity to store patient date (atleast 40 patients)
   H. Digital to digital recording provision for still and moving images

F. **Light source**
   A. Powerful 300 watt Xenon lamp
   B. Spare lamp atleast 5 to be provided
   C. Automatically light adjustment intensity to achieve ideal illumination

G. **Compatible with diagnostic and therapeutic high frequency treatment devices like electrosurgical procedure**

H. The equipment should **(a)** be conform to the standards laid down by the Bureau of Indian Standards (BIS) and if not then device shall **(b)** conform to the standard laid down by the International Organization for Standardization (ISO) or the International Electro Technical Commission (IEC), or by any other pharmacopoeial standards and if not (a) or (b) then **(c)** the device shall conform to the validated manufacturer's standards.

I. Demonstration, if required has to be given.

J. Five years of warranty followed by five years of CMC

K. List of consumables to be given alongwith rates which will be freezed for five years.

L. Should be accompanied with

A. Cytology brush – Qty 5
B. Dormia Basket – Qty 1
C. Alligator forceps - Qty 5
D. Cupped forceps - Qty 5
E. Grasping forceps - Qty 5
F. TBNA needles- Qty 5
G. Insertion channel caps – Qty 5

SPECIFICATIONS OF ULTRASOUND CUM ECHO COLOUR DOPPLER

1. It should be suitable for vascular access (CVC placement, PICC, DVT) anaesthesia related procedures like Nerve Blocks, E-FAST examination, AAA Exam, Small parts, applications in adults and also suitable for echocardiography intervention, Chest ultrasonography for critically sick having acute respiratory distress syndrome or cardiogenic pulmonary edema.
2. The system should be state of the art with the facility of B-mode, M-Mode, Colour Doppler Imaging (CDI), Tissue Doppler Imaging (TDI), Pulsed wave (PW) Doppler, and Continuous Wave (CW) Doppler
3. Transducers should include:
    a. Broadband Convex Transducer: 2-5 – MHz (±2)
    b. Broadbase cardiac: 1-5 MHz (±0.5)
    c. Linear Array Transducer: 6-13 MHz (±2)
4. System should have dynamic range of 20`280 dB
5. System should be offered with a 10-inch or more Medical Grade Display monitor with facility for position adjustments.
6. System should have atleast three universal active probe ports with electronic switching facility from keyboard.
7. Probes should be of broad band type B mode & colour-flow images should be simultaneously available side by side in real time.
8. Digital zoom facility for region of interest in real time and frozen images should be available
9. Auto trace and measurement should be available
10. Image storage facility on inbuilt hard disc or MOD/CD/DVD-RW facility should be available
11. Inbuilt hard disk or external storage with minimum capacity of 500 GB or more
12. Should have Real Time Compound Imaging Technology with Multiple transmitted lines of sight in convex, and linear probes.
13. System should be capable of scanning upto depth of 30 cm or more
14. System should be offered with a 2D frame rate of atleast 500 frames/ second
15. Frame rate in colour mode should at least be 40 frames per/seconds
16. Battery backup for minimum of 60 minutes or more
17. Trolley should be accompanied with the instrument
18. Should provide five years' onsite warranty and another five years CMC
19. The equipment should **(a)** be conform to the standards laid down by the Bureau of Indian Standards (BIS) and if not then device shall **(b)** conform to the standard laid down by the International Organization for Standardization (ISO) or the International Electro Technical Commission (IEC), or by any other pharmacopoeial standards and if not (a) or (b) then **(c)** the device shall conform to the validated manufacturer's standards
20. Demonstration, if required has to be given.
21. Five years of warranty followed by five years of CMC
22. List of consumables to be given alongwith rates which will be freezed for five years.

Additional Technical specification for Ultrasound Cum Echo-Colour Doppler (Portable), Qty – 06 Nos

1. The Unit must be compact, portable and Light weighting less than 5 kg Appox.
2. System should support Hockey stick shape probe also.
3. System should possess software for Enhanced Needle Visualization to track the needle clearly at steep angles during the procedures while managing striking imaging quality of the target structures and the surrounding anatomy with simple on/off functionality. This facility should be available on all probes for superficial as well as deeper blocks.

TECHNICAL SPECIFICATION HAEMODIALYSIS MACHINE WITH SLED WITH PORTABLE RO PLANT

1. Machine should be capable of performing HD, SLED and HDF
2. Bicarbonate dialysis with dry bicarbonate facility.
3. Variable Bicarbonate, sodium and ultra-filtration profiling.
4. High flux dialysis should be possible.
5. Programmable auto start option and auto self-testing completely software driven
6. Heparin pump flow rate from 0.5ml to 10 ml per hour. It should work with syringe of different volumes.
7. Automatic recalibration whenever machine is switched on.
8. Blood pump rate from 50 to 600 ml/min.
9. Dialysate fluid flow rate 100 to 700 ml/min.
10. Volumetric ultra-filtration for every accurate UF to the accuracy of plus minus 1%. Volume controlled via Balance Chamber with separate UF pump.
11. Disinfection – chemical and thermal, automatic with both short & long disinfection program with Day-Night, Weekly schedules.
12. Should have longer stand by time to save the acid concentrate and the R/O water
13. Should have large colour TFT touch screen/touchpad monitor and display.
14. Should be able to monitor pulse rate and Blood Pressure.
15. Sequential Ultra-filtration & Haemodialysis should be possible.
16. Built-in device for measurement and monitor of urea clearance (K) dialysis dose (Kt/V), and automatically during treatment.
17. The measurement of urea clearance (K), dialysis dose (kt/V and shall be performed in non-invasive mode without additional disposable required during treatment.
18. Audio-Visual alarms. It should store alarms in the machine during dialysis so that they could be retrieved later on.
19. There should be conductivity, temperature blood leak, air leak, trans- membrane pressure alarm, end of dis-infection alarm, along with bypass facility and bloodpump stop alarm
20. Pressure monitor – arterial, venous.
21. All important data be pre-settled so that machine can be used without feeding data every time
22. Integrated Patient Data Management System should be available
23. There should be facility of generation of online replacement fluid by the machine
24. Battery back-up for 15-20 minutes should be provided
25. 2 sets of Endotoxin filters should be provided
26. Accessories:
    a. Tubing's – 20 Qty
    b. Dialyzer filter – 20 Qty
    c. Bicarbonate powder – 20 Qty
    d. Bicarbonate solution– 20 Qty
    e. Endo toxin filter– 20 Qty
    f. Disinfectant solution– 20 Qty
    g. Double lumen dialysis catheter – 20 Qty
27. The equipment should **(a)** be conform to the standards laid down by the Bureau of Indian Standards (BIS) and if not then device shall **(b)** conform to the standard laid down by the International Organization for Standardization (ISO) or the International Electro Technical Commission (IEC), or by any other pharmacopoeial standards and if not (a) or (b) then **(c)** the device shall conform to the validated manufacturer's standards

Portable RO plant

1. Should be of compact design on wheels for easy movement.
2. Should be able to produce approx 125 Liter/Hour of permeate.
3. The system must be Microprocessor based.

4. In build capabilities to show on display for Permeate (Supply in liter/min, temperature) & for Raw Water (Consumption in Liters/min & Pressure)
5. Should have built in dual column softener with fully automated brine, fill and clean cycles, also have a brine tank incorporated in the system.
6. Should have built in cartridge type Charcoal Filter.
7. Should have fully automatic disinfection system in place.
8. Should have built in cartridge filter of 10 Micron and 5 Micron.
9. Should have programmable fully automated Rinse cycle for membranes wash.
10. There should be a provision of OFF line mode and ONLINE mode of Permeate Supply, in case permeate supply is to be used to run dialysis machines directly without collecting permeate to tank it should be possible.
11. There should be a water saving system in place which adjusts the Tender for Hemodialysis Machine with Portable RO Machine output to the number of machines in use and control yield accordingly.
12. Should not have noise level more than 65 dB
13. Should deliver the water quality as per AAMI standard.
14. Yield setting should be between 50 to 70 %.
15. The equipment should **(a)** be conform to the standards laid down by the Bureau of Indian Standards (BIS) and if not then device shall **(b)** conform to the standard laid down by the International Organization for Standardization (ISO) or the International Electro Technical Commission (IEC), or by any other pharmacopoeial standards and if not (a) or (b) then **(c)** the device shall conform to the validated manufacturer's standards
16. Provision of U-V lamp before RO membrane.
17. Online UPS with 30 minute battery backup (Price to be quoted separately)
18. Accessories
    a. Salt tablet
    b. RO filters – 5, 10, 15 microns
    c. Disinfectants
19. Demonstration, if required has to be given.
20. Five years of warranty followed by five years of CMC
21. List of consumables to be given alongwith rates which will be freezed for five years.