

All India Institute of Medical Sciences

Veerbhadrha Marg, Pashulok,
Rishikesh-249203



Tender document for Establishment of Simulation Lab
at AIIMS, Rishikesh

Tender fees (Rs.1000 +GST@18.0% Rs.180)Rs.1180****

EMD: Rs, 48,00,000/- (Forty Eight Lakh Only)

Date of Pre-bid Conference: 13-12-2017 at 3.00 PM

Last date of submission of bid: 29-12-2017 till 3.00 PM

Date and time of opening of Bid: 29-12-2017 at 03:30 PM

TENDER NOTICE

Establishment of Simulation Lab
AIIMS, Rishikesh, Virbhadra Marg, Rishikesh, Dehradun
Dated:05-12-2017

1. Sealed tenders on turnkey basis in Two Bids (Technical & Financial) are invited on behalf of the Director, All India Institute of Medical Sciences, Rishikesh from interested and eligible manufacturer or their authorised distributors, for establishment of Simulation Lab at AIIMS **Rishikesh**.
2. The interested agencies, manufacturer or their authorised dealers/ distributors are required to submit the technical and financial bid separately. The bids in Sealed Cover-I containing “Technical Bid” and Sealed Cover-II containing “Financial Bid” should be placed in one sealed cover envelop super scribed “**Tender For establishment of simulation lab**” and should reach at the office of “**The Administrative Officer, AIIMS, Rishikesh, Virbhadra, Marg Rishikesh (Dehradun) - 249201**”, before 03.00 PM on or before dated **29-12-2017**. The bid received after due date and time will not be entertained whatsoever may be the reason. The technical bids shall be opened on the same day at 03.00 PM at Tender Opening Room, AIIMS, Rishikesh in presence of persons representing the prospective bidders. In the event of any of the above mentioned date being declared as a holiday / closed day, the tenders will be opened on the next working day at the appointed time. The date for opening of financial bid of technically qualified agencies will be announced later.
3. The tender document containing of Seven Chapters, where technical bid form, financial bid form, technical description/specification & item and terms & conditions can be purchased from the office of Administrative Officer - AIIMS, Rishikesh from **05-12-2017 to 29-12-2017** between 10.00 AM and 02.00 PM on non-refundable payment of Rs.1180.00 (Rupees one thousand one hundred eighty only) or can be downloaded from website www.aiimsrishikesh.edu.in. Those who download the tender document from website should enclose DD/Pay Order for Rs.1180.00 (Rupees one thousand one hundred eighty only) (*non-refundable*) in favour of “AIIMS, Rishikesh”, payable at Rishikesh, not later the date of dated **28-12-2017** along with their technical bid in the Cover-I “Technical Bid”. The bid security (EMD) for **establishment of establishment of simulation lab** as given in table-1 below tender documents should be paid in the form of demand draft/FD/TD/CD from any Nationalised/Schedule bank duly pledged in favour of “AIIMS, Rishikesh” payable at Rishikesh and will be placed in Cover-1 with technical bid. The Tender Documents are not transferable.
4. Any enquiry about this tender document may be addressed to the Administrative Officer, for their timely resolution. Any future clarification and/or corrigendum(s) shall be communicated through Administrative Officer on the AIIMS, Rishikesh website: www.aiimsrishikesh.edu.in. and other Central Government Procurement Websites (*subject to its access of AIIMS Rishikesh*).The bidders are required to regularly check the website to know about any/all such corrigendum(s) as only these bids, taking care of such corrigendum(s) shall be considered for finalisation of the tender.
5. Bidder should necessarily enclose a covering letter mentioning a summary of applied document with proper numbering. Secondly, bid should also attach a compliance sheet as per specification mentioning that they are complying to all specification or have any variation.

Administrative Officer
AIIMS, Rishikesh
0135-2462915

TENDER DOCUMENT**Chapter-I****(Instructions to bidder & conditions of contract)****(A) General Information and Conditions relating to Submission of Bids**

1. The tender document containing eligibility criteria, scope of work, terms & conditions and draft agreement can be purchased from AIIMS, Rishikesh on any working day from **05-12-2017 to 29-12-2017** between 10.00 AM to 02.00 PM on payment of non-refundable charges of Rs 1180/- (Rupees one thousand one hundred eighty only) or can be downloaded from website www.aiimsrishikesh.edu.in. Those who download the tender document from Website should enclose a Demand Draft/Pay Order for Rs 1180/-(Rupees one thousand one hundred eighty only) in favour of “**AIIMS, Rishikesh**”, payable at Rishikesh, not later the date of **28-12-2017**, along with their bid in the **Cover-I** containing “Technical Bid”.

2. The interested firms/suppliers are required to submit the Technical and Financial Bids separately in the format enclosed and they have to observe highest standard of ethics while bidding for this tender. The bids in sealed Cover-I containing “**Technical Bid**” and sealed Cover-II containing “**Financial Bid**” should be placed in a third sealed cover super scribed “**establishment of simulation lab**” should reach AIIMS, Rishikesh by or before 03.00 PM on **29-12-2017** The Technical bids shall be opened on same day at **03.00 PM** at AIIMS, Rishikesh in presence of the bidders or their authorized representatives (Authorization letter required to be submitted) who choose to remain present. The Tender received after due date & time will not be considered and no claim shall be entertained whatsoever may be the reason.

3. The pre bid conference would be held on **13-12-2017 at 03.00 PM** in the office of Tender Opening Room, AIIMS, Rishikesh. All firm’s representative who are attending the pre bid meeting, shall produce an authorization letter from their firm on the firm’s letter head. They are required to put their query in writing before the committee and submit the same in writing on its letter head.

4. All the duly filled/completed pages of the tender should be given serial /page number on each page and signed by the owner of the firm or his Authorized signatory. In case the tenders are signed by the Authorized signatory, a copy of the power of attorney/authorization may be enclosed along with tender. A copy of the terms & conditions shall be signed on each page and submitted with the technical bid as token of acceptance of terms & conditions. Tender with unsigned pages/incomplete/partial/part of tender if submitted will be rejected out rightly.

5. All entries in the tender form should be typed or written by pens legible and filled clearly. If the space for furnishing information is insufficient, a separate sheet duly signed by the authorized signatory may be attached. No overwriting or cutting is permitted in the Technical Bid as well as Financial Bid unless authenticated by full signature of bidder. Any omission in filling the columns of Financial Bid form (Schedule of Rates) shall debar a tender from being considered. Rates should be filled up carefully by the tenderer. All corrections in this schedule must be duly attested by full signature of the tenderers. The corrections made by using fluid and overwriting will not be accepted and tender would be rejected.

6.(i) **Bid Security:** -The bidder shall pay the respective amount of Bid Security (EMD) as mentioned in table-I along with the Technical Bid by way of demand draft/FD/TD/CD in favour of “**AIIMS, Rishikesh**” drawn on any Nationalized Bank/ Scheduled Bank and payable at Rishikesh and must be valid for (6) six month. Bids received without tender fees and Earnest Money deposit (EMD) shall stand rejected and thus shall not be considered for evaluation etc. at any stage. The original EMD will be put in cover-I containing with Technical bid.

- a) The Public Sector Undertaking of the Central/State Govt./MSEs/MSME/Registered with Central Purchase Organization are exempted from furnishing Earnest Money along with tender, **subject to submission of its valid proof.**
- b) The firms Registered with DGS & D/SSI and any approved source of Centre/States Govt. are not exempted from furnishing Earnest Money in so far as this institute is concerned.

- c) Earnest Money deposited with AIIMS, Rishikesh in connection with any other tender enquiry even if for same/similar material / Stores by the tenderer will not be considered against this tender.
- (ii) EMD is required to protect the purchaser against the risk of Bidders conduct. The EMD will be forfeited if the bidder withdraws or amends its tender or impairs or derogates from the tender in any respect within the period of validity of its tender or if it comes to the notice that the information/ documents furnished in its tender is incorrect or false.
7. The bid security (EMD) without interest shall be returned to the unsuccessful bidders after finalization of contract with successful bidder.
8. Bidders are not allowed to submit more than one bid anytime during the tendering process for the same/similar tendered item else all his bids shall be cancelled thereby making him disqualified in addition to the forfeiture of the EMD.
9. The successful bidders have to execute a contract on Indian non judicial stamp paper of Rs.100/- (Rupees one hundred only) within twenty-one (21) days from the date of award of this tender in his favour and also required to furnish the **Security Deposit @ 10%** of contract value in the form of FD/BG/TD/CD for **three months extra of the contract period** from any Nationalised/Schedule bank duly pledged in favour of AIIMS, Rishikesh & payable at Rishikesh only. The EMD deposited by successful bidder may be adjusted towards Security Deposit as demanded above after its validation for the required period. If the successful bidder fails to furnish the full security deposit or difference amount between Security Deposit and EMD within 21 (twenty-one) days after the issue of **Letter of Award** of Work, his bid security (EMD) shall be forfeited and award of tender in suppliers favour automatically stands terminated at his cost & liability, unless time extension has been granted by AIIMS, Rishikesh.
10. The EMD/PBG shall be forfeited if successful bidder fails to supply the goods/equipment in stipulated time or fails to comply with any of the terms & conditions of the contract or fail to sign the contract.
11. The bid shall be valid and open for acceptance by the competent authority of AIIMS Rishikesh for a period of 180 (one hundred eighty) days from the published date of opening of the tenders and no request for any variation in quoted rates and / withdrawal of tender on any ground by bidders shall be entertained. The unilateral withdraw at any stage will cause forfeiture of EMD in addition to any remedy that the purchaser may have under the law.
12. To assist in the analysis, evaluation and computation of the bids, the Competent Authority, may ask bidders individually for clarification of their bids. The request for Clarification and the response shall be in writing but no change in the price or substance of the bid offered shall be permitted.
13. After evaluation, the work shall be awarded normally to the Agency fulfilling all the conditions of the contract and who has quoted the lowest rate as per financial bid after complying with the all the Acts / provisions stated / referred to for adherence in the tender.
14. The name of such successful bidder will be displayed on the website of the institute www.aiimsrishikesh.edu.in within 7 (seven) days from the date of execution of this tender contract by him.
15. The competent authority of AIIMS, Rishikesh reserves all rights to accept or reject any/ all tender(s) without assigning any reason. It can also impose/relax any administrative term and condition/specifications of the tender enquiry after due discussion in pre-bid conference. This will be communicated and shown over the website of the Institute. No representation will be considered after pre-bid meeting and **bidders may ensure its queries only in pre-bid meeting.** AIIMS, Rishikesh also reserves the right to reject any bid which in his opinion is non-responsive or violating any of the conditions/specifications without any liability to any loss whatsoever it may cause to the bidder in the process.
16. Tender must be submitted on the prescribed Tender Form otherwise tender will be cancelled straightway.

17. The tender form is not transferable.
18. Canvassing in any form is strictly prohibited and the tenderers who are found canvassing are liable to have their tenders rejected out rightly.
19. It is required by all concerned, namely the Bidders/Suppliers, as the case may be to observe highest standard of ethics during the procurement and execution of this Tender.
20. Installation at consignee's site should be free of cost immediately on arrival of equipment at consignee's site.
21. In case the quality of goods supplied are not in conformity with the standard given in tender and as per the samples supplied or the supplies are found defective at any stage these goods shall immediately will be taken back by the supplier and will be replaced with the tender quality goods, without any delay. The competent authority reserves all rights to reject the goods if the same are not found in accordance with the required description / specifications and liquidates damages shall be charged in addition to the cost of re- tender. The supplier is required to provide the demonstration of equipment at AIIMS premises to the AIIMS representatives for its evaluation as per the specification & desired functionality standard. However, a submission of videography displaying functionality as per tender specification may also be considered by the AIIMS, representative.
22. In case the bidder on whom the supply order has been placed, fails to establish complete simulation lab within the time schedule and the Institute has to resort risk of completion, the Institute (AIIMS, Rishikesh) may recover from the tender the difference between the cost calculated on the basis of risk purchase price and that calculated on the basis of rates quoted by tenderer. In case of repeated failure in supplying/establishing complete simulation lab the required goods/work the work order may be cancelled and bid security deposit will be forfeited.
23. Deviation in work/equipments: - Where the specifications are as per tenderer's range of products the tenderer's offer should mention that the item meets all specifications as per the tender enquiry and if there are improvements/deviations the same should be brought out on separate Letter Head of the firm. It would be discretion of the competent authority of the institute to accept or reject such deviations which are not in accordance with our required specifications as given below the financial bid.
24. It must be mentioned clearly whether bidder is a manufacturer/sole distributor/ sole agent for the items for which he is quoting.
 - a. **Manufacturer** must add a certificate that item(s) is manufactured by them as per range of products.
 - b. **Sole Manufacturers** must add a certificate that they are the sole manufacturer of the Item for which they are quoting in this tender enquiry & item is /are their proprietary Item in India. The rate certificate is also required from the sole manufactures that the Rates quoted are the same as they quote to other State/Centre Govt./reputed Private Organisation and DGS&D rate for the similar item(s) and these are not higher than those quoted by them.
 - c. **Authorized agents** must add authority letter from their Manufacturer/Principals on the letter head of the manufacturer/principals signed by a competent person and comes in proforma given in attach must duly supported by a notarised affidavit on Indian Non Judicial Stamp Paper of Rs.10/- (Rupees ten only) that they are quoting Rates on behalf of them. The authorization letter must give/mention the purpose for which it is allowed. The validity period of the authorization letter must be mentioned in the authority letter otherwise tender will be liable to rejection.
25. The bidders should have furnished a copy of GST/S.T. /C.S.T./VAT registration number, the State / U.T. of registration and the date of such registration. Tenders not complying with this condition will be rejected.

26. **Turnover provisions:** - (i) The tenderers should submit along with the tender, a photo state copy of the last three years Annual Accounts with Audit certificate by Chartered Accountant, Income Tax returns and a copy of current valid income tax clearance certificate (IT CC), otherwise bidder will not be considered for administrative evaluation (in evaluation of Technical bid) and will be declared **disqualified** in technical evaluation.
- (ii) In case of bidder falls under Section 44AD/44ADA/44AE of Income Tax shall be required to submit turnover certificate verified by Chartered Accountant with his Registration number issued by Institute of Chartered Accountants of India.
- (iii) In case of supplier is an Indian Agent, the firm can submit copies of purchase orders issued in favour of firm (*As the payment is made through LC directly to foreign manufacturer and equipment payment does not exist in the book of account of the supplier*) in support to its turnover whatever amount is getting short.
- (iv) There will be relaxation on turnover on *case to case* basis for **Start-up firms** registered by Government of India under Start-ups scheme as per orders of Ministry of Commerce, Government of India.
27. **Sample/demonstration:** - In case, the item required prior submission of sample/ performing demonstration, tenderer will have to submit sample/perform demonstration of the equipment/item to the competent authority of the institute, the bidder will have to born all the expenses for the same. Non submission of sample/non performing demonstration will **disqualify** the bidder in the technical bidding process and financial bid of the bidder will not be opened.
28. The tenderer hereby guarantees that the equipment supplied to the Institute (purchaser) under the Contract shall be of the best quality/latest version and workmanship and new in all respects and shall be strictly in accordance with the specification and particulars contained/ mentioned in the Tender Document. The date of manufacturing of the equipment/goods supplied will not be more than 3 (Three months) old. The tenderer will have further guarantees that the said equipment would continue to conform to the description and quality aforesaid for a period of five (5) years guarantee period (As per MoH&FW guidelines), from the date of installation of the said equipment to the purchaser and notwithstanding the fact that the Purchaser (Inspector) may have inspected and /or approved the said equipment, if during the aforesaid period of five years the said equipment be discovered not to conform to the description and quality as required as per specification or not giving satisfactory performance or have deteriorated, the decision of the Purchaser in that behalf shall be final and binding on the tenderer and the Purchaser shall be entitled to call upon the tenderer to rectify the equipment or such portion thereof as is found to be defective by the purchaser within a reasonable period or such specified period as may be allowed by the purchaser in his discretion on/an application made thereof by the tenderer and in such an event, the above mentioned warranty period shall apply to the equipment replaced from the date of replacement thereof. In case of failure of the tenderer to rectify or replace the equipment, within specified time, the purchaser shall be entitled to recover the cost with all expenses from the tenderer for such defective equipment.
29. Full description & specifications, make/brand and name of the manufacturing firm must be clearly mentioned in the tender, failing which, the tender will not be considered. The tenderer must also mention whether the goods are imported / indigenous. Descriptive literature / catalogues must be attached with the tender in original, failing which, tender may be disqualified.
30. **Force Majeure:** Any failure or omission to carryout of the provisions of this supply by the supplier shall not give rightfor any claim by supplier and purchaser to one against the other, if such failure or omission arise from an act of God which shall include all acts of natural calamities from civil strikes compliance with any statistics and or requisitions of the Government lockout and Strikes, riots, embargoes or from any political or other reasons beyond the suppliers control including war (whether declared or not) civil war or state of incarceration provided that notice of the occurrence of any event by either party to the other shall be within two weeks from the date of occurrence of such an event which could be attributed to force majeure. Any delay due to Force Majeure will not be attributable to the either of the parties.

31. The equipment installed should be up for 95% of the total warranty time. If the equipment is down for more than 5% suitable action shall be taken against the supplier including imposition of penalty as deemed fit.
32. If there is a close system the tenderer shall ensure and will have to submit an affidavit on Indian Non Judicial stamp paper of Rs.10/- along with technical bid that spare parts and consumables for these equipment's/instruments/item will be available at reasonable fixed rates for next 10 (ten) years, such rates should not be more than the rates supplied to institutes of national importance.
33. The successful Bidder shall at all times agree to indemnify and keep indemnified the purchaser against all losses, damages which may arise in respect of action/inactions of such Bidder or breach of any term of this tender by such Bidder. All claims regarding indemnity shall survive the termination of the contract with such Bidder.
34. In case the vendor fails to complete the work of complete simulation lab and supply of its the spare parts or fails to provide the agreed maintenance during the prescribed period, as per the terms of contract, the purchaser is automatically entitled to procure the required parts and hire services from the market at the risk and cost of the vendor, such inability of bidder will entail forfeiture the security deposit. The purchaser also reserves the right to terminate the contract on immediate notice, if the vendor fails to comply with this clause for more than one instance.
35. **Liquidated damage/demerge:** - The time fixed for completion of Establishing of complete simulation lab stipulated in work order shall be deemed to be the essence of the contract and if the bidder fails to complete the aforesaid CCU within the period prescribed for establishment of simulation lab in work order, penalty/liquidated damages may be deducted from the bill @ 0.5% per week subject to maximum of 10% of the value of the delayed goods or services under the contract. The competent authority of the institute may also cancel the work at the cost & liability of the bidder. In such a case, bid security of the bidder shall stand forfeited. The supply of equipment must be in single consignment, inclusive of all parts & accessories in adherence to the specification so as to make it fully functional simulation lab. No work completion Report shall be signed in case of absence of any part as per the specification.
36. **Legal Jurisdiction:** -The Courts at Rishikesh/ Dehradun alone and no other Court will have the jurisdiction to try the matter, dispute or reference between the parties arising out of this tender/supply Order/contract.

Applicable Law:

37. The contract shall be governed by the laws and procedures established by Govt. of India, within the framework of applicable legislation and enactment made from time to time concerning such Commercial dealings / processing.
38. Any disputes are subject to exclusive jurisdiction of Competent Court and Forum in Rishikesh/Dehradun, Uttarakhand India only.

39. Except as otherwise provided under this Contract for immediate termination of the Contract, in the event of a disputes which may be arising out of the execution of the tender contract, the matter will be referred to the Deputy Director (Administration). Appeal against the decision of the DDA will lie to the Director, AIIMS Rishikesh and his decision shall be final and binding upon both the parties.

I / We hereby accept the terms and Conditions given in the tender

(Signature & Stamp of the bidder)

Note- Please sign each page of document including terms & conditions & tender

(B) Financial terms and conditions

1. Rates are strictly required to be offered/quoted on the prescribed **“Financial Bid format”**. Financial bid submitted without prescribed format may not be considered and will be deemed improper subject to the condition that there is a requirement to mention other item which are not mentioned in the said format.
2. Rates quoted should be inclusive of all applicable taxes, packing, forwarding, postage and transportation charges at for AIIMS Rishikesh (Site of installation/Use). To sum up the rates should be quoted for establishment of complete simulation lab. Rates should be mentioned both in figures and in words. The offer should be typed or written in Ink Pen/ Ball Pen without any correction. Offers in pencil will be cancelled. Telegraphic/ Telex/ Fax offers will not be considered and cancelled straightway.
3. The supplier has to submit a notarised affidavit on Indian Non Judicial Stamp Paper of Rs.10/- that the bidder has not quoted the price higher than previously supplied to any government Institute/Organisation/reputed Private Organisation or DGS&D rate in recent past. Therefore, if at any stage it has been found that the supplier has quoted lower rates than those quoted in this tender; the Institute (the purchaser) would be given the benefit of lower rates by the Supplier and any excess payment if any, will become immediately payable to the AIIMS, Rishikesh. If such affidavit is not submitted, tender will be out rightly rejected.*(Part of technical bid)*
4. If the price of the contracted articles is/ are controlled by the Government, in no circumstances the payment will be higher than the controlled rate.
5. Tender will be regarded as constituting an offer open to acceptance in whole or in part at the discretion of the competent authority of the institute for a period of 180 days (6 months) valid from the date of opening of the tender by the committee.
6. The corrections made by using fluid and overwriting will not be accepted and tender would be rejected.
7. Tenderer shall have to provide complete warranty for all equipment's for 5 (five) years & followed by CMC for 5 (five) years of the equipment's and other items installed in the CCU. Financial bid should be quoted accordingly. In this regard, the tenderer shall submit a notarised affidavit on Indian Non Judicial Stamp Paper of Rs.10/- that bidder will provide complete warranty for entire equipment's installed in the Cath Lab for 5 (five) years & CMC for 5 (five) years of the entire items and equipment's.
7. **Tender Currencies:**
 - a. The bidder supplying indigenous goods or already imported goods shall quote only in Indian Rupees. Further, imported goods to be imported and supplied by the bidder are also required to be quoted in Indian Rupees.
 - b. For imported goods, if supplied directly from abroad, prices shall be quoted in any freely convertible currency say US Dollar, Euro, GBP or Yen. As regards price(s) for allied services, if any, required with the goods, the same shall be quoted in Indian Rupees only, if such services are to be performed /undertaken in India.
 - c. Tenders, where prices are quoted in any other way shall be treated as non -responsive and rejected.
8. **Tender Prices:** While filling up the columns of the Financial Bid, the following aspects should be noted for compliance: -
 - I- *For domestic goods or goods of foreign origin located within India, the prices in the corresponding Financial Bid shall be entered separately in the following manner: -*

- a. The price of the goods, quoted ex-factory/ ex-showroom/ ex-warehouse/ off-the-shelf, as applicable, including all taxes and duties like sales tax, GST/CST/ VAT, CENVAT, Custom Duty, Excise Duty etc. already paid or payable on the components and raw material used in the manufacture or assembly of the goods quoted ex-factory etc. or on the previously imported goods of foreign origin quoted ex-showroom etc.;
- b. Any sales tax or other taxes and any duties including excise duty, which will be payable on the goods in India if the contract is awarded;
- c. Charges towards Packing & Forwarding, Inland Transportation, Insurance, Loading/Unloading and other local costs incidental to delivery of the goods to their final destination as specified in the List of Requirements and Financial Bid;
- d. The price of Incidental Services, as mentioned in List of Requirements and Financial Bid;
- e. The prices of Turnkey (if any), as mentioned in List of Requirements, Technical Specification and Financial Bid; and
- f. The price of CMC **after warranty period**, as mentioned in List of Requirements, Technical Specification and Financial Bid.

II- For goods offered from abroad, the prices in the corresponding Financial Bid shall be entered separately in the following manner: -

- a. The price of goods quoted FOB port of shipment, as indicated in the List of Requirements and Financial Bid;
 - b. The price of goods quoted CIF port of entry in India as indicated in the List of Requirements and Financial Bid;
 - c. The price of goods quoted for delivery at AIIMS, Rishikesh as indicated in the List of Requirements, Financial Bid and Consignee List;
 - d. Wherever applicable, the amount of custom duty with CDEC applicable on CIF value on the goods to be imported;
 - e. The charges for Loading/Unloading, Inland transportation, Insurance and other local costs, Incidental cost to delivery of the goods from the port of entry in India to AIIMS, Rishikesh, as specified in the List of Requirements and Financial Bid;
 - f. The charges for Incidental Services, as in the List of Requirements and Financial Bid;
 - g. The prices of Turnkey (if any), as mentioned in List of Requirements, Technical Specification and Financial Bid; and
 - h. The price of annual CMC,after warranty period as mentioned in List of Requirements, Technical Specification and Financial Bid.
9. Additional information and instruction on Duties and Taxes: If the Bidder desires to ask for excise duty, sales tax/GST/CST / VAT/ CENVAT, Custom Duty, Service Tax, Works Contract Tax etc. to be paid extra, the same must be specifically stated. In the absence of any such stipulation the price will be taken inclusive of such duties and taxes and no claim for the same will be entertained later.

10. Excise Duty:

- a. If reimbursement of excise duty is intended as extra over the quoted prices, the supplier must specifically say so also indicating the rate, quantum and nature of the duty applicable. In the absence

of any such stipulation it will be presumed that the prices quoted are full and final and no claim on account of excise duty will be entertained after the opening of tenders.

b. If a Bidder chooses to quote a price inclusive of excise duty and also desires to be reimbursed for variation, if any, in the excise duty during the time of supply, the Bidder must clearly mention the same and also indicate the rate and quantum of excise duty included in its price. Failure to indicate all such details in clear terms may result in rejection of that tender.

c. Subject to sub clauses (i) & (ii) above, any change in excise duty upward/downward as a result of any statutory variation in excise duty taking place within contract terms shall be allowed to the extent of actual quantum of excise duty paid by the supplier. In case of downward revision in excise duty, the actual quantum of reduction of excise duty shall be reimbursed to the AIIMS Rishikesh by the supplier. All such adjustments shall include all reliefs, exemptions, rebates, concession etc. if any obtained by the supplier.

11. **Sales Tax:** - If a bidder asks for sales tax/GST/CST / VAT/CENVAT, Service Tax and Works Contract Tax to be paid extra, the rate and nature of sales tax applicable should be shown separately. The GST/CST / VAT/CENVAT, Service Tax and Works Contract Tax will be paid as per the rate at which it is liable to be assessed or has actually been assessed provided the transaction of sale is legally liable to sales tax/ GST/CST / VAT/CENVAT, Service Tax and Works Contract Tax and is payable as per the terms of the contract.

12. **Octroi Duty and Local Duties & Taxes:** - Normally, goods to be supplied to Government departments against Government contracts are exempted from levy of town duty, Octroi duty, terminal tax and other levies of local bodies. However, on some occasions, the local bodies (like town body, municipal body etc.) as per their regulations allow such exemptions only on production of certificate to this effect from the concerned Government department. Keeping this in view, the supplier shall ensure that the goods to be supplied by the supplier against the contract placed by the AIIMS, Rishikesh are exempted from levy of any such duty or tax and, wherever necessary, obtain the exemption certificate from the AIIMS, Rishikesh. However, if a local body still insists upon payment of such local duties and taxes, the same should be paid by the supplier to the local body to avoid delay in supplies and possible demurrage charges and obtain a receipt for the same. The supplier should forward the receipt obtained for such payment to the AIIMS, Rishikesh to enable the AIIMS, Rishikesh reimburse the supplier and take other necessary action in the matter.

13. **Customs Duty:** In respect of imported goods offered from abroad, the bidder shall specify the rate as well as the total amount of customs duty payable with Custom Duty Exemption Certificate, if applicable, on the quoted goods in the Financial Bid. The bidder shall also indicate the corresponding Indian Customs Tariff Number applicable for the goods.

a. For transportation of imported goods offered from abroad, relevant instructions as incorporated shall be followed.

b. For insurance of goods to be supplied, relevant instructions as provided shall be followed.

c. Unless otherwise specifically indicated in this NIT document, the terms FCA, FOB, FAS, CIF, CIP etc. for imported goods offered from abroad, shall be governed by the rules & regulations prescribed in the current edition of INCOTERMS, published by the International Chamber of Commerce, Paris.

d. The need for indication of all such price components by the bidders, as required in this clause is for the purpose of comparison of the tenders by the purchaser and will no way restrict the AIIMS, Rishikesh right to award the contract on the selected bidder on any of the terms offered.

14. **Indian Agent:** - If a foreign bidder has engaged an agent in India in connection with its bid, the foreign bidder, in addition to indicating Indian agent's commission, if any, shall also furnish the following information:

a. The complete name and address of the Indian Agent and its Permanent Account Number as allotted by the Indian Income Tax authority.

- b. The details of the services to be rendered by the agent for the subject requirement.
- c. Details of Service outlets in India, nearest to the AIIMS, Rishikesh to render services during Warranty and CMC period.

Firm Price:-

- a. Unless otherwise specified in the NIT, prices quoted by the bidder shall remain firm and fixed during the currency of the contract and not subject to variation on any account.
- b. However, as regards taxes and duties, if any, chargeable on the goods and payable, the conditions stipulated will apply.

15. **Conversion of tender currencies to Indian Rupees:** - In case the bid document permits the bidders to quote their prices in different currencies, all such quoted prices of the responsive bidders will be converted to a single currency viz., Indian Rupees for the purpose of equitable comparison and evaluation, as per the closing exchange rates established by the Reserve Bank of India for similar transactions, as on the date of 'Opening Date of Financial Bid'.

16. **Payment terms:** -If the supplier supplied the requisite item within stipulated time and installation is pending on the part of AIIMS Rishikesh on various reasons, up to 90 *per cent* payment against supply can be made by the AIIMS Rishikesh on the case wise only, but will not be considered as precedence in all cases.

(A)Payment Term for Imported goods: For imported goods payment shall be made in the following manner:

- a) On shipment: 75 % payment of the contract price shall be paid 60 days after presentation of shipping documents {goods shipped shall be paid through irrevocable, non-transferable Letter of Credit (LC) opened in favour of the supplier in a bank in his country} and upon the submission of the following documents: -
 - i. Four copies of Supplier's invoice showing contract number, goods description, quantity, unit price and total amount;
 - ii. Original and four copies of the clean, on-board Bill of Lading/ Airway bill, marked freight prepaid and four copies of non-negotiable Bill of Lading/Airway bill.
 - iii. Insurance Certificate;
 - iv. Certificate of origin by the chamber of commerce of the concerned country;
 - v. Certificate of country of origin;
 - vi. Manufacture's / Supplier's warranty certificate;
 - vii. Manufacturer's own factory inspection report.
- b) On Acceptance: 25 % payment would be made after satisfactory installation, commissioning, demonstration and training, if required on issuance of Inspection certificate by the AIIMS, Rishikesh.

B) PAYMENT TERMS FOR INLAND GOODS

(Seventy-five) 75% Payment of the contract price shall be paid on receipt of goods condition and upon the submission of the following documents: -.

- (i) One Original and Four Copies of supplier's invoice showing contract number, goods description, quantity, unit price and total amount.
- (ii) Final Acceptance as per Inspection report issued by faculty.
- (iii) Two copies of packing list identifying contents of each package.
- (iv) Inspection Certificate issued by the user concerned department.
- (v) Final Acceptance Certificate issued by the Institute

On Acceptance: -

- (i) Balance Twenty-Five (25) % payment would be made against 'Final Acceptance Certificate' as per Para (B) (i) &(v) of goods to be issued by the consignee's subject to recoveries, if any, either on account of non-rectification of defects/deficiencies not attended by the Supplier or otherwise.

17. **Guarantee / Warrantee Period:** The Tenderers must quote for 5 years' comprehensive warranty (Including all Spares, Accessories software application, if any and Labour) from the date of completion of the satisfactory installation. The warranty charges shall not be quoted separately otherwise the offer shall be summarily rejected. Also the bidders are requested to submit their quote (Rates) for subsequent 5 years Comprehensive Maintenance Contract (CMC) (Including All Spares, Accessories software application, if any and Labour). Failure to comply this condition will entail the rejection of the bids. The price comparison shall be taken into account on basic price and post warranty CMC.

18. **Custom Clearance:** For the Goods to be imported and supplied, the Institute will provide Custom Duty Exemption Certificate (CDEC) to successful bidder for availing concessional rate of duty as per prevailing Custom Tariff. In case, the bidder requires CDEC certificate, then the same should be specifically mentioned in the bid. The supplier is solely responsible for getting the material clearance from customs. Institute will provide all custom documents for custom clearance on the demand of supplier. The supplier undertakes to fully co-operate to avoid any fine, demurrage or other charges and shall indemnify AIIMS Rishikesh in case of any such failure. Transportation of goods up to AIIMS, Rishikesh and its successful installation and commissioning demonstration (and training, if required) is also the responsibility of the supplier. All charges/ expenses incurred in this process will be borne by the supplier and after submission of deposit slips of custom clearance and transportation charges will be reimbursed to the supplier if said provisions are to be shown separately in the financial bid..

NO DEMURRAGE / WHARFAGE CHARGES WILL BE PAYABLE BY THE INSTITUTE UNDER ANY CIRCUMSTANCES. NO ADVANCE PAYMENT WILL BE PAYABLE FOR CUSTOM CLEARANCE/ FREIGHT/INSURANCE ETC

Note: In case of any dispute regarding award of tender, decision of AIIMS Administration would be final.

I / We hereby accept the terms and Conditions given in the tender

(Signature & Stamp of the bidder)

Note- Please sign each page of document including terms & conditions & tender

Establishment of simulation lab at AIIMS, Rishikesh

TECHNICAL BID

(In separate sealed Cover-I super scribed as “Technical Bid”)

1. Name & Address of the manufacturer and their authorised dealers/ distributors/Agency with phone number, email, name and telephone/mobile	
2. Specify your firm/company is a manufacturer/ authorised dealer/ distributor/ Agency	
3. Whether the signature on each page has been made by the of bidder or not.	
4. Name, Address & designation of the authorized person (Sole proprietor/partner /Director)	
5. Have you previously executed CCU/ICU works to any government/ reputed private organization? If yes, attach the relevant poof thereof.	
6. Please provide a notarised affidavit on Indian Non Judicial stamp paper of Rs. 10/- that you have not quoted the price higher than previously supplied to any government Institute/Organisation/reputed Private Organisation or DGS&D rate in last one year. If you don't fulfil this criteria, your tender will be out rightly rejected.	
7. Please attach copy of last three years' of Income Tax Return	
8. Turnover a. Please attach balance sheet (duly certified by Chartered Accountant) for last three (3) years (Attach copy of average minimum turnover for three years should not be less than 30 crores duly certified by the Chartered Accountant) b. The bidder falls under Section 44AD/44ADA/44AE of Income Tax Act shall be required to submit turnover certificate verified by Chartered Accountant with his Registration number issued by Institute of Chartered Accountants of India. c. Indian Agent can submit its copy of POs of LC cases, in support of its amount getting short in required turnover. d. Start-ups may submit its Start-up Registration for consideration (<i>Relaxation in turnover can be considered as the case may be, subject to fulfilment of other conditions. However, it will not mandatory</i>)	
9. PAN No. (Please attach copy)	
10. GST/VAT/Service Tax Registration Number. (Please attach copy)	
11. Acceptance of terms & conditions attached (Yes/No). Please sign each page of terms and conditions as token of acceptance and submit as part of tender document with technical bid. Otherwise your tender will be rejected.	
12. Power of Attorney/authorization for signing the bid documents (Not required in case of sole-proprietorship.)	
13. Please submit a notarised affidavit on Indian Non judicial stamp paper of Rs. 10/- that no case is pending with the police against the Proprietor/firm/partner or the Company (Agency). Indicate any convictions in the past against the Company/firm/partner.	
14. Please declare that proprietor/firm/company has never been black listed/debarred by any organization. An oath certificate to this effect may be enclosed on Rs.10 notarised stamp paper.	
15. Please submit a notarised affidavit on Indian Non Judicial Stamp Paper of Rs.10/- that they will provide complete warranty for all equipment's/items for 5 (five) years followed by CMC for further 5 (five) years of these equipment's/items.	
16. Please furnished a notarised affidavit on Indian Non judicial stamp paper of Rs.10/- that they will supply spare parts for next 10 years at reasonable price by submission of suitable benchmarks.	
17. Please submit two performance certificate from your two different customers to whom you have supplied such type of equipment in previous 3 years	
18. Details of the FD/DD/TD/CD of bid security (EMD) FD/DD/TD/CD No: Date: Payable at-	Detail of cost of Tender for Rs. 1180/- (if downloaded from website) DD No. Date: Payable at-

Undertaking

1. I/We have read and understood the contents of the Tender and agree to abide by the terms and conditions of this Tender.
2. I/We shall supply the items of requisite quality and quantity at given rate in timely manner.
3. I/We also confirm that in the event of my/our tender being accepted, I/we hereby undertake to furnish within 15 days, Bank Guarantee/ Performance Security after the issue of Purchase Order, as applicable, in the format to be provided by AIIMS Rishikesh in addition to execution of a Contract as pre-condition for obtaining the supply orders.
4. I/We further undertake that none of the Proprietor/Partners/Directors of the firm was or is Proprietor or Partner or Director of any firm with whom the Government have banned /suspended business dealings. I/We further undertake to report to the AIIMS Rishikesh immediately after we are informed but in any case not later 15 days, if any firm in which Proprietor/Partners/Directors are Proprietor or Partner or Director of such a firm which is banned/suspended in future during the currency of the Contract with you.
5. I/We undertake that the information given in this tender are true and correct in all respect and I/We hold the responsibility for the same.

(Signature of the Bidder)

Name:

Designation with Seal of the Firm:

“Establishment of simulation lab”

AIIMS, Rishikesh

Chapter-II (Schedule of requirements& EMD)

Table-I

Details of items & their tentative quantity and EMD

The following work of Establishment of complete Simulation Lab on turnkey basis manufactured by Indian/International firms/agencies of repute are required.

S.No.	Item	Quantity	EMD
1	establishment of simulation lab	01 Nos.	INR 48,00,000/-

AIIMS Rishikesh tender Enquiry No. F.No 24/Lab/277/2017-RISH (ADMN)

“Establishment of Simulation Lab”**Financial Bid****A) FINANCIAL BID FOR DOMESTIC GOODS OR GOODS OF FOREIGN ORIGIN LOCATED WITHIN INDIA OR GOODS TO BE IMPORTED AND SUPPLIED AGAINST PAYMENT IN INDIAN RUPEES**

1 Schedule	2 Brief Description of Goods	3 Country of Origin	4 Quantity (Nos.)	5 Price per unit (Rs.)						6 Total Price (at AIIMS-Rishikesh) basis (Rs.) = {4 x 5(h)}
				Ex - factory/ Ex-warehouse /Ex-showroom /Off-the shelf (a)	Excise Duty(if any) [%age & value] (b)	Sales Tax/ GST/VAT(i f any) [%age & value] (c)	Packing and Forwarding charges (d)	Inland Transportation , Insurance, loading/ unloading and Incidental costs till AIIMS-Rishikesh (e)	Incidental Services (including Installation & Commissioning, Supervision, Demonstration and Training) at the AIIMS-Rishikesh (f)	

Note: -

- If there is a discrepancy between the unit price and total price THE UNIT PRICE shall prevail. In case of calculation error, lower cost will be accepted between actual cost & error cost.
 - The unit cost including five (5) years guarantee/warrantee should be mentioned as per table-1. The above quote should include all applicable taxes and F.O.R AIIMS Rishikesh. L1 will be decided on the basis of unit cost in addition to CMC value of 5 years and turnkey cost, where applicable including all applicable taxes at time of financial bid evaluation of individual equipment.*
 - The Bidder must quote price for “GOODS TO BE IMPORTED AND SUPPLIED AGAINST PAYMENT IN INDIAN RUPEES” after having taken in to account, the provision of Custom Duty Exemption Certificate (CDEC) by the Purchaser, as per Customs Tariff Act.
- Declaration by the Bidder:** - (i) *This is to certify that I/We before signing this tender have read and fully understood the Tender document viz terms & condition of the contract, rules regarding purchase of equipment for Department of Cardiology. I/We agree to abide them.*
- (ii) *No other charges would be payable by purchaser and there would be no increase in rates during the contract period.*

Place:

Date:

Name:

Business Address:

Signature of Bidder:

Seal of the Bidder:

AIIMS Rishikesh tender Enquiry No. F.No 24/Lab/277/2017-RISH (ADMN)

Financial Bid**B) FINANCIAL BID FOR GOODS TO BE IMPORTED FROM ABROAD**

1 Schedule	2 Brief Description of Goods	3 Country of Origin	4 Quantity (Nos.)	5 Price per unit (Rs.)					6 Total price on Destination + Insurance (local transportation and storage) = {4X 5 (e)}
				FOB price at port/ airport of Lading (a)	Carriage / Insurance (port of loading to port of entry) and other Incidental costs** (b)	Incidental Services (including Installation & Commissioning, Supervision, Demonstration and Training) at the AIIMS-Rishikesh ** (c)	Unit Price CMC for 5 years if applicable (d)	Unit Price on DDP AIIMS-Rishikesh + Extended Insurance (local transportation and storage) (e) = a+b+c+d	

Indian Agent: Indian Agency Commission - ____% of FOB

** To be paid in Indian Currency (Rs.)

Total Tender price in foreign currency: _____

In words: _____

Note: -

1. If there is a discrepancy between the unit price and total price THE UNIT PRICE shall prevail. In case of calculation error, lower cost will be accepted between actual cost & error cost.

2. *The unit cost including five (5) years guarantee/warranty should be mentioned as per table-1. The above quote should include all applicable taxes and F.O.R AIIMS Rishikesh. L1 will be decided on the basis of unit cost in addition to CMC value of 5 years and turnkey cost, where applicable including all applicable taxes at time of financial bid evaluation of individual equipment.*

3. The Bidder will be fully responsible for the safe arrival of the goods AIIMS-Rishikesh in good condition as per terms of DDP as per INCOTERMS, if applicable.

4. Custom Duty/clearance charges/transportation charges from Airport or Shipyard to Rishikesh will be reimbursed to the bidder and can be recouped later by the Institute by presenting all original documents/bills of such authorities.

Declaration by the Bidder: - (i) This is to certify that I/We before signing this tender have read and fully understood the Tender documents viz terms & condition of the contract, rules regarding purchase of equipment's for Department of Cardiology. I/We agree to abide them.

(ii) No other charges would be payable by purchaser and there would be no increase in rates during the contract period.

Place:

Date:

Name:

Business Address:

Signature of Bidder:

Seal of the Bidder:

AIIMS Rishikesh tender Enquiry No. F.No 24/Lab/277/2017-RISH (ADMN)

Financial Bid
B) FINANCIAL BID FOR TURNKEY WORK

S.No	Items	Preferred Makers	Financial Quote for Entire Work (In Rupee)	Financial Quote for Entire Work (In Rupee)
A	FLOORING VITRIFIED TILES	Somany, Kajaria , H&R Johnson, RAK India		
B	PAINT	Dulux, Asian Paints , Nerolac		
C	PLUMBING	Kohler, Jaguar , Grohe , Roca		
D	SANITARY ITEMS	CERA, Hindware, Parryware		
E	ELECTRICAL:			
1	CABLES	Finolex, Havells , V-Guard		
2	SWITCHES	Legrand, L&T, Crabtree , Roma		
3	DISTRIBUTION BOX, MCB	Legrand, L&T, Siemens, Havels		
4	LIGHT FITTINGS	LED only Philips / Crompton / Syska/Wipro		
F	AIR CONDINTIONING	Carrier, Hitachi, Voltas		
G	FURNITURE	Hermen Miller , Godrej , Geeken		
Total of turnkey project				

Note: -

1. If there is a discrepancy between the unit price and total price THE UNIT PRICE shall prevail. In case of calculation error, lower cost will be accepted between actual cost & error cost.

Declaration by the Bidder: - (i) This is to certify that I/We before signing this tender have read and fully understood the Tender documents viz terms & condition of the contract, rules regarding purchase of equipment's for Department of Cardiology. I/We agree to abide them.

(ii) No other charges would be payable by purchaser and there would be no increase in rates during the contract period.

Place:

Date:

Name:

Business Address:

Signature of Bidder:

Seal of the Bidder:

MANUFACTURER's / PRINCIPAL's AUTHORIZATION FORM

(Clause 11 (c) of **other terms and conditions** of the tender)

To

The Administrative Officer,
All India Institute of Medical Sciences
Rishikesh

Dear Sir,

TENDER: _____.

we, _____, who are established and reputable manufacturers of _____, having factories at _____ and _____, hereby authorize Messrs. _____ (*name and address of agents*) to bid, negotiate and conclude the contract with you against Tender No. _____ for the above goods manufactured by us.

We hereby extend our full guarantee and warranty as per the conditions of tender contract for the goods offered for supply against this tender by the above firm.

The authorization is valid up to _____

Yours faithfully,

(Name)

For and on behalf of Messrs. _____
(*Name of manufacturers*)/Principal.

AIIMS Rishikesh tender Enquiry No. F.No 24/Simulation Lab/277/2017-RISH (ADMN)
BANK GUARANTEE FORM FOR PERFORMANCE SECURITY/ CMC
SECURITY

To

The Administrative Officer

All India Institute of Medical Sciences
Rishikesh,
Virbhadra Marg,
Rishikesh-249201

WHEREAS _____ (Name and address of the supplier) (Hereinafter called “the supplier”) has undertaken, in pursuance of contract no _____ dated _____ to supply (description of goods and services) (herein after called “the contract”). AND WHEREAS it has been stipulated by you in the said contract that the supplier shall furnish you with a bank guarantee by a scheduled commercial bank recognised by you for the sum specified therein as security for compliance with its obligations in accordance with the contract; AND WHEREAS we have agreed to give the supplier such a irrevocable bank guarantee;

NOW THEREFORE we hereby affirm that we are guarantors and responsible to you unconditionally, on behalf of the supplier, up to a total of. _____ (Amount of the guarantee in words and figures), and we undertake to pay you, upon your first written demand declaring the supplier to be in default under the contract and without cavil or argument, any sum or sums within the limits of (amount of guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

We hereby waive the necessity of you to first demanding the said amount of guarantee from the supplier before raising the demand with us. You may directly raise the demand with us, without asking the supplier for the same.

We further agree that no change or addition to or other modification of the terms of the contract to be performed there under or of any of the contract documents which may be made between you and the supplier shall in any way release us from any liability under this guarantee and we hereby waive notice of any such change, addition or modification.

This guarantee will not be changed due to change in the constitution of the bank or the supplier.

This guarantee shall be valid up to 65 months from the date of satisfactory installation of the equipment i.e. up to --
----- (indicate date).

.....
(Signature with date of the authorized officer of the Bank)

.....
Name and designation of the officer

.....
Seal, name & address of the Bank and address of the Branch

SPECIFICATION FOR SIMULATION LAB ON TURNKEY BASIS

1. The turnkey simulation lab must consist of following simulators.
 - a. Human Patient Simulation including Adult Male and Pediatric mannequin as per Annexure 1
 - b. Wireless Trauma Care and Anesthesia Management Simulator (Adult Male) as per Annexure 2
 - c. Wireless Trauma Care and Anesthesia Management Simulator (Adult Female) as per Annexure 3
 - d. Maternal and Fetal Simulator As per annexure 4
 - e. Laparoscopic Simulator As per annexure 5
 - f. Ultrasound Simulator As per annexure 6
 - g. Baby Simulator As per annexure 7
 - h. Various task trainer As per annexure 8
 - i. Centralized Class Management System As per annexure 9
2. Single vendor should quote all the above systems.
3. The bidder shall be responsible for designing & creating the setup. Institute shall provide space with roof and floor only. Partitions & Floorings have to be done by the bidder.
4. Bidders can visit and inspect the site for simulation centre design before quoting the tender.
5. Bidder will be responsible for integration of centralized classroom management system with simulators.
6. The bidder should have experience in installing at least 3 simulation centers in the country.
7. Bidder has to provide a training program with a faculty trained on simulation initially for atleast 10 working days at AIIMS Rishikesh during installation. (The faculty shall be responsible for training the trainer). Bidder have to train the faculty thrice during the warranty period as per requirement.
8. The simulators should be in functional (95% upworking time). In any case if any repair is needed it should be attend within 48 hours or AIIMS Rishikesh will penalize as per the tender clause .
9. Warranty: 5 years (with spares) & CMC for next 5 years (with spares)
10. A necessary three visit per year of company engineer is mandatory in warranty period apart from repair call for calibration. The visit has to be registered in institute Log book, verified by Central store incharge.

11. Firm must quote cost of CMC for further 5 years .Bidder will be responsible to inform the institute at least 6months earlier for CMC
12. Any software upgradation on any of simulators has be to done free of cost during the warranty period
13. An undertaking has to be given by supplier that the quoted simulator is of latest technology.
14. Firm must quote cost of consumables (if any) separately valid for 5 years.
15. Bidder should be Indian agent of the manufacturers for last 03 years and should submit order copy executed by the bidder for the quoted manufacturer/ principal in last three years.

SPECIFICATION FOR HUMAN PATIENT SIMULATION INCLUDING ADULT MALE AND PAEDIATRIC MANNEQUIN

SPECIFICATIONS	
1.	Human Patient Simulator for Training & Education of undergraduates, Post graduate students & Health professionals in routine and special clinical situations in adult as well as pediatric.
2.	It Should offer sophisticated validated mathematical models of human physiology and pharmacology and capable of determining automatically the patients response to user actions and interventions.
3.	Human Patient Simulation System should comprise the following: It Should be supplied with two following mannequins :- i). Adult Mannequin should represent the physical characteristic of an adult male / female patient with interchangeable genitalia ii) Pediatric mannequin should represent the physical characteristic of an adult male / female patient with interchangeable genitalia.
4.	It should be fully operational in supine, Lateral & Prone position and can be placed on O. T. Table, ICU Beds, patient trolley.
5.	It should react to intravenous drugs, CPR, defibrillation, intubations ventilation, anesthetic agents, catheterizations & other procedures.
6.	Should physically demonstrate of various clinical signs (i.e. heart, breath sounds, palpable pulses, chest excursion, airway patency etc.) which should be dynamically coupled with the validated mathematical models of human physiology and pharmacology. Should respond automatically as per human physiology and should have facility for manual intervention by instructor.
7.	The mannequin shall be able to transmit voice sounds. -The instructor shall be able to simulate patient voice and phrases via microphone
8.	<u>COMPUTERISED SYSTEM CONTROLLER</u> i Simulation system should be supplied complete with PC console and a hand held Laptop for instructor to control all aspects of simulator from bedside of the patient. ii The system should have facility to be connected to gases (through cylinders or hospital central gas pipeline) namely oxygen,CO2 , Air , N2O, nitrogen . The mannequin should not use gas cartridges. iii The firm must supply one cylinder each for oxygen,CO2 , nitrogen and N2O and must supply air compressor .
9.	<u>UTILITY SOFTWARE</u> : Simulation system should be supplied complete with software for:

<ul style="list-style-type: none"> i Modification of preconfigured scenarios & patient profiles or creating new scenarios & profiles. The system shall be capable of operating automatically as per the patient physiology changes because of action taken by the student on the mannequin which permits the simulation to proceed without instructor interaction. In scenarios as well. ii Recording of patients physiology and intervention by student, instructor or central software iii should be able to model drugs using software template. iv Modification of pharmacokinetics & pharmacodynamics parameters of selected drugs.
<p>10. <u>PATIENT MONITOR</u> : Mannequin should have facility to be connected to a real clinical patient monitor for monitoring following parameters :</p> <ul style="list-style-type: none"> i) 5 Lead ECG ii) NIBP iii) IBP (2ch) iv) SPO2 v) Cardiac Output vi) ST. Segment & Arrhythmia Analysis vii) ETCO2 viii) Anesthetic agents (sevoflurane, Halothane, Isoflurane, enflurane)
<p>11. <u>ANAESTHESIA MACHINE:</u> (Should be compatible with Mannequin)</p>
<ul style="list-style-type: none"> i Should be supplied complete with flow meters for Air, Oxygen, and Nitrous Oxide with low flow range and hypoxia guard. ii Electronic anesthesia ventilator for Paed. & Adult usage. iii Breathing circuit (02 nos. each) for adult & paed. Patient. iv 2 Vaporizers (Halothane, Isoflurane) v Circle Absorber.
<p>12. <u>DEFIBRILLATOR</u> with ECG Monitoring, integrated adult & paed. paddles.</p>
<p>13. <u>ICU Ventilator</u> for adult & paed. Applications with modules e.g. SIMV, APRV, CPAP & PEEP etc</p>
<p>14. The system shall be supplied with stethoscope, laryngoscope, LMA, Combitubes, trolley and bed suitable for CPR with IV stand, Resuscitation cart, Resuscitator, torch, and nerve stimulator</p>
<p>15. <u>AIRWAY SYSTEM</u> for both adult and paediatric mannequin</p>
<ul style="list-style-type: none"> i Mannequins should provide automatically realistic oropharynx, naso-pharynx and larynx representing adult and paediatric patient
<ul style="list-style-type: none"> ii Should allow direct laryngoscope, oral and nasal tracheal intubation.

iii	Should support mainstream endobronchial intubation, esophageal intubation.
iv	Should allow for activation of laryngospasm activator & airway occluder to create "cannot ventilate, cannot intubate" crisis scenario in both adult and pediatric.
v	Should allow instructor to activate tongue swelling of varying degrees.
vi	Should support the use of Combitubes, lighted stylets and fiber optic intubation tubes.
vii	Should be able to perform following airway skills
viii	<p>Controllable open / closed airway, automatically or manually controlled</p> <p>a Suctioning (Oral and Nasopharyngeal)</p> <p>b Bag mask ventilation</p> <p>c Orotracheal intubation</p> <p>d Nasotracheal intubation</p> <p>e Combitubplacement</p> <p>f LMA placement</p> <p>g Right Mainstream intubation</p> <p>h Endotracheal tube intubation</p> <p>i Retrograde intubation</p> <p>j First grade fiber-optic intubation</p> <p>k Transtracheal jet ventilation</p> <p>l Light wand intubation</p> <p>m Needle cricothyrotomy</p> <p>n Surgical cricothyrotomy</p>
ix	Variable lungs compliance according to physiological condition and should be stepless
x	Variable airway resistance according to physiological condition and should be stepless
xi	Stomach distention shall be possible-
16. PULMONARY SYSTEM for both adult and paediatric mannequin	
i	The patient should breathe spontaneously with a self regulated rate and tidal volume sufficient to maintain a target arterial carbon dioxide which can be adjusted by the instructor. Normal and abnormal breath sounds shall be present
ii	Oxygen Saturation and plethysmogram shall be displayed on the clinical patient monitor
iii	Should have pre-cut for Bilateral chest tube insertion for saving skin replacement ,

iv	chest tube insertion with fluid output and automatic resolution of physiology .
v	Should be capable of simulating events such as atelectasis,pneumothorax,asthma, COPD etc.
vi	The mannequin's lungs should physically consume O ₂ ,produce CO ₂ and uptake or excrete N ₂ O,sevflurane, isoflurane, and halothane and should be displayed on a clinical monitor .
vii	Independent control of left & right lung to model airway resistance, lung compliance, as well as control of chest wall compliance. Bilateral and unilateral chest rise and fall shall be possible
viii	The lungs should be realistically modeled with respect to the range of tidal volumes & functional residual capacity.
ix	Should have facility to superimpose modes of ventilation (spontaneous, assisted & mechanical) one on another and respiratory system should be capable of triggering a ventilator.
x	Ventilation should result in appropriate production of expired CO ₂ , which registers correctly on external capnograph.
xi	Should give appropriate & dose dependent pulmonary response to intravenously injected drugs.
xii	Should have facility to continuously Calculate patients arterial blood gas & PH
xiii	Should have modeled hemodynamics to automatically reflect patient physiology , pathology and student interventions.
<u>17. CARDIO VASCULAR SYSTEM for both adult and paediatric mannequin</u>	
i	Should simulate heart sound synchronized to QRS complex of ECG, generate 5 lead ECG from appropriate positions on the patients chest and Should be able to simulate associated abnormalities such as myocardial ischemia, sinus tachycardia &bradycardia, ventricular fibrillation &asystole.
ii	An extensive ECG library shall be available and should change automatically according to physiological response of patients
iii	12 lead dynamic ECG display shall be possible on a simulated monitor and printout of the same should be possible
iv	Should have palpable carotid, radial, brachial, femoral pedal pulses synchronous to ECG.
v	Should have independent control of left & right radial, brachial, femoral & pedal pulses.
vi	Should simulate hypovolemia& hypervolemia and right and / or left heart failure.
vii	Should be able to simulate patients blood pressure that can be measured with cuff of NIBP Monitor, and provide monitoring of haemodynamic parameters.
viii	Blood pressure shall be measurable manually by auscultation of Korotkoff'ssound and automatically through clinical monitor (left arm)
ix	Pulse strength shall be related to blood pressure

18 METABOLIC SYSTEM for both adult and paediatric mannequin	
i	Should physiologically model Actual blood gases including pH, Pco ₂ , Po ₂ accurately corresponding to alveolar concentration of CO ₂ & O ₂ .
ii	Should allow instructor to adjust ABG pH level to simulate Metabolic Acidosis and alkalosis
19 GENITO URINARY SYSTEM: for both adult and paediatric mannequin	
i	Mannequin should allow insertion of urinary catheters, & offer instructor controlled or automatic scenario controlled excretion of urine and its flow rate.
ii	Bowel sound shall be available via speakers
iii	Should have interchangeable genitalia
20 NEUROLOGIC SYSTEM:	
i	Adult and paediatric mannequin should model cardio vascular & respiratory responses to sympathetic & para sympathetic activities.
ii	Adult mannequin should have electrode attachment for peripheral nerve stimulator.
iii	Adult mannequin should automatically detect PNS stimulus pattern and generate appropriate thumb twitch response.
21. ADVANCED CARDIAC LIFE SUPPORT SYSTEM for both adult and paediatric mannequin	
i	Should display alveolar & arterial gas concentrations appropriately reflecting efficacy of ventilatory technique employed.
ii	Should display artificial circulation, cardiac output, Central & peripheral blood pressure, palpable pulses & CO ₂ return as a result of effective chest compression.
iii	Should have facility to select & maintain desired cardiac Arrhythmia and central patients response to clinical intervention.
iv	Should have facility to apply conventional & automatic external defibrillators to the patient and should trigger appropriate patient response and should be viewable on a clinical monitor
v	Should have provision to apply transcutaneous pacemakers and pacing & capture should be possible
vi	Should support all drug required by ACLS algorithm.
22. TRAUMA FEATURES: for both adult and paediatric mannequin	
i	Should simulate constriction & dilation of pupils of each eye in response to changing light stimuli.
ii	Eyes shall include blinking include slow, normal and fast
iii	Eye movement shall be electronically controlled causing sensors to enter movement information into an event log
iv	Pupil shall be synchronous and asynchronous

v	The manikin should have facility of secreting real fluids from eyes, ears and mouth.
vi	Should have provision to perform needle decompression of Tension Pneumothorax, & chest tube placement and management.
vii	Vital signs shall automatically respond to bleeding and therapy events
viii	Should have facility to perform subxyphoid needle peri-cardiocentesis to resolve acute cardiac tamponade.
ix	Right arm shall have IV access
x	IO access shall be possible via tibia and sternum
<u>23. PHARMACOLOGY & DRUG RECOGNITION SYSTEM; for both adult and paediatric mannequin</u>	
i	Should have preprogrammed pharmacokinetic and pharmacodynamic parameter for over 50 (fifty) intravenous medications.
ii	Should incorporate various intravenous access points such as antecubital, right internal jugular and femoral veins in the mannequin.
iii	Should have facility to administer injection & intravenous infusions from main PC console or instructors hand held remote control.
iv	Mannequin should appropriately & automatically respond to incorrect medications.
v	Should have drug recognition system to identify drug, its concentration & quantity of dosage given.
vi	Should have facility to modify/edit pharmacodynamics & pharmacokinetic models of existing drugs & to add new drugs.
<u>24. Anesthesia and Scavenging</u>	
i	Ability to administer anesthetic agents and medical gases
ii	Lungs should consume oxygen and produce carbon dioxide
iii	Uptake and distribution of nitrous oxide and volatile anesthetics
iv	Direct gas exchange within the lungs
v	Mechanical ventilation fully supported with automatic responses to CPAP, PSV, PEEP, SIMV, assist control modes and weaning protocols
vi	Simulator should flow trigger or pressure trigger a ventilator to cycle
vii	Simulator should be configured to fight the ventilator
viii	Expired carbon dioxide should be automatically based on patient condition and interventions
<u>25. PATIENT PROFILES & SCENARIOS</u>	
i	Should have at least 25 pre-configured profiles of patients of various ages, medical history, gender & physiological parameter

ii	Should have facility to change existing patient profiles and to create new patient profiles.
iii	It should be possible to capture the current state of patient at any part of simulation session & to use it as new patient.
iv	Simulator should have at least 50 pre-configured scenarios of events & crises.
v	Should have facility to change existing scenarios and to create new scenarios of events & crises.
26	Simulator Should be supplied complete with Web-based Digital Video & Audio Management System for Recording, Debriefing, Assessment and Evaluation
i	Web based digital video and audio management system for integration and synchronization of simulation exercise including physiological data logs, event logs, pharmacology data logs and patient monitoring data from multi simulators providing complete record for debriefing assessment and evaluation.
ii	Should provide observation of simulation exercise and Ability to visualize and control the system from a central location.
iii	The system shall permit X-Rays to be inserted into simulations via stimulated patient monitor
iv	Should provide of capturing and control of simulation sessions and monitor and control playback in sync with any simulation event, data point or instructor's annotation during debriefing session or when a simulation is taking place
v	The system should include:
vi	Support for real-time video and audio streams
vii	Record and replay the entire simulation for facilitated debriefing and after-action review
viii	Broadcast simulation to internal and external locations
ix	Place-shift and time-shift the simulation recording
x	Room-centric recording to follow action in a specific location
xi	Observe and switch between multiple camera views (real-time, time-shifted) with zoom in/out capability
xii	Supplied complete with control console, camera, Ethernet network cables, digital audio video recording system.
xiii	Software Specifications
1.	It should have the facility for Live broadcasts in any browser with as little as half a second of latency.
2.	Should have Up to 4 concurrently displayed and synchronized camera streams or 3 cameras and 1 simulator in each room.
3.	Should Simultaneously view up to 25 live streams (one from each room) on a center overview screen
4.	Should have facility for Widescreen HD video broadcast and recording, full screen mode.
5.	On-screen PTZ controls: click on image to pan and tilt, drag image to zoom in and out from multi or single room views. View any configured room securely using SSL certificates
6.	It should be able to Connect any simulated or real patient monitor for capturing and broadcasting HD screen image

7. Optical character recognition to turn the video signal from monitor into real-time data streams for visual trend charts and searchable physiological data
8. Use predefined layouts or define your own for identifying key captured values on the connected screen Supports remote site configuration
9. Define pre-set camera angles, which can be jumped to instantly during live action Pause live or recorded view and continue where you stopped (“time shifted live view”)
10. Manually start/stop recording or set recording to occur based on a schedule or on user actions
11. Access and control all recorded videos on one page (debriefing, deleting, downloading, renaming or reassigning videos)
12. Generate and export custom reports covering both group and individual performance, or use one of the many predefined report options
13. Give learners access to their reports at home or on campus
14. Export data from server to work outside of system
15. Review faculty and standardized patient performance reports for quality assurance and consistency
16. Track the use of simulation center resources (Rooms, Simulators, Personnel, etc.) by client. Generate reports
17. quarterly/by semester/yearly
18. Allow faculty to submit booking requests for specific rooms/resources within the simulation center, to be managed by center administration
19. Follow Learner progress in key skill areas throughout their career within your program

27. Adult Simulator must include minimum of the following preconfigured Scenarios.

A. ANAESTHESIA

- i Aortic Cross Clamping
- ii Anaphylaxis in Awake Patient
- iii Cannot Intubate, Cannot Ventilate
- iv Cardiac Tamponade
- v Emergence Apnea
- vi Emergence Hypertension
- vii Emergence with Laryngospasm
- vii Emergence with Negative Pressure Pulmonary Edema
- ix Total Spinal Anesthesia
- x Local Anesthetic Toxicity During IV Epidural Injection
- xi Sympathectomy due to Epidural Anesthesia
- xii Hypoxia due to Bronchospasm During Induction of Anesthesia
- xiii Hypoxia due to Atelectasis in the Obese Patient During Laparoscopy
- xiv Malignant Hyperthermia Under General Anesthesia
- xv Tension Pneumothorax
- xvi Peripheral Nerve Block Complications
- xvii Anesthesia Machine Failure

- xviii Anaphylaxis Under General Anesthesia
- xix Awareness During Caesarean Section
- xx Perioperative Anterior Myocardial Infarction

B. OBSTETRIC

- i. Amniotic Fluid Embolism
- ii. Epidural Analgesia
- iii. Pulmonary Aspiration
- iv. Supine Hypotension Syndrome
- v. Obstetrics Venous Air Embolism
- vi. Pre-Eclampsia

C. Allied Health

- i. Angina with Cardiac Arrest
- ii. Asthmatic with Pneumothorax
- iii. Chronic Obstructive Pulmonary Disease (COPD) with Respiratory Failure
- iv. Heart Failure with Pulmonary Edema
- v. Inferior Myocardial Infarction
- vi. Organophosphate Exposure
- vii. Pneumonia with Septic Shock
- viii. Severe Young Asthmatic
- ix. Splenic Rupture with Pneumothorax
- x. Stab Wound to the Chest
- xi. Subdural Hematoma
- xii. Anaphylaxis
- xiii. Anterior Myocardial Infarction
- xiv. Tension Pneumothorax

D. Advanced Cardiac Life Support (ACLS)

- i. ACLS Acute Coronary Syndrome
- ii. ACLS Acute Stroke
- iii. ACLS Asystole
- iv. ACLS Bradycardia and Heart Blocks
- v. ACLS Pulseless Electrical Activity
- vi. ACLS Pulseless Ventricular Tachycardia and Ventricular Fibrillation
- vii. ACLS Respiratory Arrest
- viii. ACLS Supraventricular Tachycardia
- ix. ACLS Ventricular Fibrillation AED
- x. ACLS Ventricular Tachycardia

E. Advanced Life Support (ALS)

- i. ALS Acute Coronary Syndrome
- ii. ALS Acute Stroke
- iii. ALS Asystole
- iv. ALS Bradycardia and Heart Blocks
- v. ALS Pulseless Electrical Activity
- vi. ALS Pulseless Ventricular Tachycardia and Ventricular Fibrillation
- vii. ALS Respiratory Arrest
- viii. ALS Supraventricular Tachycardia
- ix. ALS Ventricular Fibrillation
- x. ALS Ventricular Tachycardia

F. Pediatric Human Patient Simulator must be includes the following preconfigured Scenarios.

1. Allied Health

- i. Electrocutation
- ii. Accidental Overdose
- iii. Closed Head Injury
- iv. Diabetic Ketoacidosis with Hypoxemia
- v. Obstructed Airway
- vi. Trauma with Pneumothorax

2. Anesthesia

- i. Cannot Intubate Cannot Ventilate
- ii. Epidural High Spinal
- iii. Foreign Body Aspiration
- iv. Hypertension and Tachycardia
- v. Spontaneous Tension Pneumothorax
- vi. Upper Airway Obstruction
- vii. Paediatric Advanced Life Support (PALS)
- viii. Asthma Attack
- ix. Asystole
- x. Bradycardia
- xi. Ingestion
- xii. Motor Vehicle Crash
- xiii. Pulseless Electrical Activity
- xiv. Septic Shock
- xv. Shock
- xvi. Supraventricular and Ventricular Tachycardia
- xvii. Ventricular Fibrillation

28. The firm must have atleast 3 installation of the same equipment in India and their performance report has to be submitted

29. Warranty 5 years and CMC for further 5 years must be quoted

SPECIFICATION FOR WIRELESS TRAUMA CARE AND ANAESTHESIA MANAGEMENT SIMULATOR (ADULT MALE)

The human patient simulator should comprise of a life like adult male mannequin, integrated with CPR analysis which must be compliant with atleast American Heart Association's 2015 guidelines with correct hand placement, depth, and rate of compressions being captured with following specifications:-.

1. It should employ multiple models of validated human physiology including cardiovascular system, pulmonary system, neuromuscular system, and central nervous system. The models should allow the patient to exhibit clinical signs (e.g., spontaneous breathing, eyelid blinking) and monitored parameters (e.g., electrocardiogram, blood pressure) and should automatically respond to therapeutic intervention without any/ minimal input from the instructor.
2. The mannequin should be controlled completely wirelessly and should not be connected to any control system/instructor computer through wires/hoses.
3. The mannequin should have a realistic skeletal structure, providing true-to-life articulated motion.
4. The simulator should have facilities to teach the following skills
 - a. Intravenous cannulation
 - b. Head tilt-chin lift, Jaw thrust methods
 - c. Airway skills
 - i. Controllable open / closed airway, automatically or manually controlled
 - ii. Suctioning (Oral and Nasopharyngeal)
 - iii. Bag-Valve mask ventilation
 - iv. Orotracheal intubation
 - v. Nasotracheal intubation
 - vi. Combitube placement
 - vii. LMA placement
 - viii. Endotracheal tube intubation
 - ix. Right Mainstream
 - x. Retrograde intubation
 - xi. First grade fiber-optic intubation
 - xii. Light wand intubation
 - xiii. Needle cricothyrotomy
 - xiv. Surgical cricothyrotomy
 - d. External pacing
5. The patient simulator should have a cardiovascular system that automatically calculates dependent variables (e.g., blood pressure, heart rate) in response to changing cardiovascular system status (e.g., bleeding, intravenous fluid administration), including the following:
 - A. A baroreceptor reflex that compensates both centrally (e.g., heart rate, cardiac contractility) and peripherally (e.g. systemic vascular resistance, venous capacitance) to maintain circulation and perfusion.
 - B. A myocardial oxygen supply (e.g., diastolic blood pressure, arterial oxygen partial pressure) and demand (e.g., cardiac contractility, heart rate) that yields appropriate cardiac response (e.g., cardiac rhythm, cardiac contractility) to myocardial ischemia. Untreated myocardial ischemia should automatically result in cardiovascular decompensation with accompanying cardiac rhythms (e.g., ST- segment depression, ventricular tachycardia, ventricular fibrillation, asystole) and ultimately, cardiovascular collapse.

- C. Arterial blood gases (e.g., PaO₂, PaCO₂, and pH) and mixed venous gases (e.g., PvO₂, PvCO₂) that realistically change.
- D. Hematocrit should be automatically calculated to reflect oxyhemoglobin saturation and administration of a variety of intravenous fluids, such as whole blood, packed red cells, colloids, and crystalloids.
- E. A complete hemodynamic monitoring package that includes the capability to measure and monitor the following:
 ABP, Left ventricular blood pressure, CVP, Right atrial pressure, Pulmonary artery pressure, Pulmonary artery occlusion (wedge) pressure, cardiac output.
6. The patient simulator should have a pulmonary system that automatically calculates alveolar and arterial gas partial pressures in response to ventilation, fraction of inspired oxygen, intrapulmonary shunt fraction, and metabolic gas exchange (For example, apnea or hypoventilation should automatically result in hypercarbia, hypoxemia, decreasing oxyhemoglobin saturation and tachycardia)
- A. During spontaneous ventilation, the patient mannequin should breathe with a spontaneously controlled respiratory rate and tidal volume to maintain normocarbida and adequate oxygenation.
- B. Positive pressure ventilation or return of spontaneous ventilation should automatically reverse apnea with the response appropriate to the rate and tidal volume or ventilation.
- C. The Patient Simulator should automatically responds to the fraction of inspired oxygen present, such as with smoke inhalation or supplemental oxygen.
- D. Should have pre-cut for Bilateral chest tube insertion for saving skin replacement .
- E. Chest tube insertion with fluid output and automatic resolution of physiology .
7. The patient simulator should have a pharmacology system model with automatic calculation of pharmacokinetics and pharmacodynamics for all commonly used intravenous and inhaled medications, yielding appropriate changes in patient clinical signs and monitored parameters. All patient responses to drug administration should be automatic, dose dependent, and follow an appropriate time course even in case of students errors.
8. Patient outcome should be solely based on patient physiology and the treatment administered (e.g., ventilation, oxygen therapy, drug therapy) and should not be influenced by subjective assessment of the operator thus providing objective evaluation of clinical performance and reducing risk of negative training transfer.
9. Patient simulator should be equipped with a simulated monitor capable of displaying all of the following parameters: ECG, Invasive Blood Pressures (ABP, CVP, PAP, Wedge Pressure), Cardiac Output, SpO₂, PR/HR, ETCO₂, Body and Blood Temperature, NIBP
- A. The simulated monitor should have configurable alarm limits with accompanying sounds for each parameter.
- B. The frequency of the pulse tone should be synchronized with the cardiac cycle and the pitch should correlate with the SpO₂ value.
10. The mannequin should have a realistic airway (mouth, oropharynx, larynx, esophagus, trachea, carina) resembling to that of an actual human patient.

- A. Depending on head positioning, choice of clinical tools, and other maneuvers, it should be possible to achieve anywhere from a Cormack Class I (e.g., easy intubation) to a Cormack Class IV (e.g., difficult intubation) airway.
 - B. The mannequin airway should allow use of airway adjuncts (e.g., combitube, laryngeal mask airway) as they are used in real patients, without any special adjustments by the instructor (e.g., activation of posterior swelling to seat the LMA).
 - C. The success or failure of airway management should be automatically reflected in the resulting ventilation, oxyhemoglobinsaturation, and overall cardiopulmonary stability.
11. The patient simulator should have trauma simulation capabilities, such as:
- A. Surgical cricothyroidotomy
 - B. Articulated mandible
 - C. Articulation in elbow, wrist, knees and elbows
 - D. Simultaneous bleeding at different sites linked to physiology
 - E. Secretions from eyes, ears, mouth.
 - F. Bi-lateral pneumothorax needle decompression at the clinically appropriate location
 - G. Bi-lateral chest tube insertion (with fluid return) at the clinically correct location.

Each trauma capability should require minimal instructor input and physiological consequences (e.g., improvement in blood pressure, ventilation, and oxyhemoglobin saturation) should be automatic.

12. The patient simulator should have fully independent left and right lungs.
- A. One-sided pneumothorax should result in chest distention on one side, with the other side rising and falling with spontaneous breathing.
 - B. The simulator should have independent breath sounds linked to ventilation of each lung for both spontaneous and mechanical ventilation.
 - C. One-lung ventilation should automatically result in appropriate breath sounds, chest excursion, and pulmonary gas exchange.
 - D. Independent bilateral trauma feature (needle decompression / chest tube)
13. The patient simulator should have independent blinking eyes and reactive pupils. Eye blinking should be automatic and dependent on the underlying patient physiology (i.e., level-of-consciousness, level of neuromuscular blockade). It should be possible to easily set the pupils to different settings (i.e., pinpoint, reactive, non reactive, blown).
14. The patient simulator should be capable of physically shaking, giving a visible clue of convulsions, tremors, or other similar conditions.
15. The patient simulator should have touch activated, bi-lateral palpable pulses in the following locations: Carotid, Brachial, Radial, Femoral, Popliteal, Pedal (dorsalis and tibialis)

16. The patient simulator should have an advanced cardiac life support system in which:
- A. Effective chest compressions automatically yield artificial circulation, cardiac output, central and peripheral blood pressures, palpable pulses, and exhaled CO₂.
 - B. Ineffective chest compressions yield inadequate cardiac output and circulation and an absence of exhaled CO₂.
 - C. Defibrillation energy is automatically identified, quantified, and logged
 - D. Pacing current is automatically identified, quantified, and logged, with appropriate physiological response.
17. The patient simulator should include independent simulations of patients (e.g., young healthymale, pregnant female, elderly patient with coronary artery disease) and injury/disease scenarios (e.g., anaphylactic shock, ruptured spleen, subdural hematoma.)
- A. It should be possible to combine any patient with any scenario, creating a wide variety of clinical care simulations.
 - B. It should be possible to run multiple conditions simultaneously to create multi-trauma care simulations.
 - C. It should be possible to run multiple injury/disease scenarios simultaneously on a particular patient to create multi-trauma simulations
- 18 Trauma kit must include:
- A. One Abdominal Evisceration, One Calf Avulsion, One Open Head Wound,
 - B. One Lacerated Thigh, One Compound Fracture (Arm), Three Bruising Patches,
 - C. Six Bullet Holes, Three Lacerations, Two Fire Burns, Three Electrical Burns,
 - D. One Spider Bite/Decubitus Ulcer, One Blood Pumping System, Simulated Blood and
 - E. One Set of Wound/Treatment Cards.
 - F. One partial and one fully amputated Arm.
 - G. One Partial and one Fully amputated leg.
19. Simulator must have the following in build learning Module Scenarios:
- A. Advanced Cardiac Life Support (ACLS)
 - i. Acute Coronary Syndrome
 - ii. Acute Stroke
 - iii. Asystole
 - iv. Bradycardia and Heart Blocks
 - v. Pulseless Electrical Activity (PEA)
 - vi. Pulseless Ventricular Tachycardia and Ventricular Fibrillation
 - vii. Respiratory Arrest
 - viii. Supraventricular Tachycardia
 - ix. Ventricular Fibrillation AED
 - x. Ventricular Tachycardia
 - B. Airway Management
 - i. Airway Hematoma
 - ii. Anaphylaxis
 - iii. Cervical Spine Fracture
 - iv. Failed Airway
 - v. Gunshot Wound
 - vi. Laryngospasm

vii. Postoperative Airway Emergency

viii. Rheumatoid Arthritis

C. CARDIOPULMONARY Critical Situations (CCS)

i. Acute Allergic Reaction

ii. Acute Asthma

iii. Burns with Airway Compromise

iv. Heroin Overdose

v. Inferior-Posterior Myocardial Infarction

vi. Ludwig's Angina

vii. Stab Wound to the Upper Neck

viii. Tricyclic Antidepressant Overdose

D. Emergency Medical Services (EMS)

i. Abdominal Aortic Aneurysm

ii. Alcohol Gastritis/Bleeding Ulcer/Esophageal Varices

iii. Chlorine Poisoning

iv. Cold Water Drowning and Hypothermia

v. Motorcycle Crash with Traumatic Evisceration

vi. Nerve Agent Organophosphate Poisoning

vii. Rattlesnake Bite

viii. Sickle Cell Crisis

ix. Spontaneous Abruption Placentae

x. Stoma Patient

SPECIFICATION FOR WIRELESS TRAUMA CARE AND ANAESTHESIA MANAGEMENT SIMULATOR (ADULT FEMALE)

1. High-fidelity, high quality aesthetically authentic, realistic and technologically-advanced female patient Simulator should look, feel and correct anatomy of the female body.
2. The Female patient simulator should integrate with CPR analysis which must comply with at least American Heart Association's latest guidelines.
3. It should employ multiple models of validated mathematical models of physiology..
4. The mannequin should be controlled completely wirelessly and should not be connected to any control system/instructor computer through wires/hoses.
5. The mannequin should have a realistic skeletal structure, providing true-to-life articulated motion.
6. Simulator eyes must be able to display patient symptoms and conditions including jaundice, hemorrhage, keyhole pupil, cataract, blood shot or droopy eyes.
7. Simulator must have the following capabilities.
8. **Airway and Breathing:**
 - i. Spontaneous breathing
 - ii. Neck articulation for sniffing position
 - iii. Articulated mandible for jaw thrust maneuver
 - iv. Should have Unilateral and bilateral chest excursions Synchronized with the ventilation (spontaneous And mechanical)
 - v. Laryngoscopy and oral intubation (LMAs, endotracheal tubes, Oropharyngeal airways)
 - vi. Bag-valve-mask ventilation
 - vii. Symmetric and asymmetric lung ventilation
 - viii. Mechanical ventilation with different ventilation Modes (CMV, SIMV)
 - ix. Ventilation efficacy should be reflected in the alveolar and arterial gas concentrations
9. **CPR :**
 - i. Correct hand placement detection
 - ii. CPR analysis (compression depth and rate, Chest recoil, compression fraction, ventilation Volume and rate)
 - iii. Compliant with at least 2015 AHA guidelines.
10. **Circulation:**
 - i. Bilateral pulses (carotid, brachial, radial, dorsalispedis) synchronous with the cardiac cycle.
 - ii. Pulse strength can be controlled
 - iii. Bilateral blood pressure measurement by both auscultation and palpation
 - iv. Pacing and defibrillation
 - v. 12-lead dynamic ECG display
 - vi. ECG monitoring posts and interfaces with real ECG monitor
 - vii. Bilateral IV access points
11. **Neurological:**
 - i. Reactive pupils with multiple settings
 - ii. Should have facility to change the colour according to condition of the patient like yellow for jaundice, red in case of blood clot
 - iii. Blinking and reactive eyes with multiple settings
 - iv. Seizures associated with rapid blinking and movement of the arms.
12. **Urinary:**
 - i. Urinary catheterization
 - ii. Urine output.
13. **Sounds:**
 - i. Pre-recorded sounds and speech, custom Vocalization recorded by the user, microphone
 - ii. Heart, bowel, and breath sounds (anterior and posterior) independently controlled (type and volume).
 - iii. Audible breathing sounds (wheezing and gasping).
14. **Simulator must be supplied with following inbuilt clinical scenarios.**
 - i. Chronic heart failure exacerbation
 - ii. Acute respiratory distress syndrome
 - iii. Sepsis with hypotension

- iv. Brain attack with thrombolytic therapy
- v. Motor vehicle collision with hypovolemic Shock.
- vi. Heart failure
- vii. Hypovolemic shock
- viii. Brain attack (CVA)
- ix. Diabetic ketoacidosis
- x. Ventricular fibrillation/cardiac arrest.

15. Learning Module :

- i. Acute Coronary Syndrome
- ii. Acute Respiratory Distress Syndrome Secondary to Postoperative Pneumonia
- iii. Anaphylactic Reaction to Blood Administration
- iv. Asthma Management of the Patient in the Home Care Setting
- v. Basic Assessment of the Adult Patient with Asthma
- vi. Basic Assessment of the Hip Replacement Patient
- vii. Basic Assessment of the Postoperative Gastrectomy Patient
- viii. Bioterrorism
- ix. Brain Attack with Thrombolytic Therapy on the Medical-Surgical Unit
- x. Cardiopulmonary Arrest
- xi. Chest Pain Management of the Postoperative Patient
- xii. Chest Tube Insertion and General Ongoing Care
- xiii. Chronic Diabetic
- xiv. Chronic Obstructive Pulmonary Disease Exacerbation
- xv. Diabetic Ketoacidosis
- xvi. Hyperemesis Gravidarum
- xvii. Intentional Overdose of a Hypnotic
- xviii. Postoperative Care of the Patient with a Ruptured Diverticulum
- xix. Postoperative Pulmonary Embolism
- xx. Preoperative Care of the Patient Scheduled for a Cholecystectomy

16. Complete system must be supplied with following:

- i. Wireless and tetherless Female Mannequin
- ii. Laptop with validated physiology software.
- iii. Simulated clinical Patient Monitor
- iv. Tablet with instructor control software

17. CLINICAL SUPPLIES: includes intubation lubricant, laryngoscope with appropriate blades, ET tubes, LMAs, combitube, bag valve mask, stethoscopes, distilled water.

SPECIFICATION FOR MATERNAL FETAL SIMULATOR

- 1 Maternal-Fetal Simulator complete with anatomically realistic mother and fetus for comprehensive training in prenatal care, labor and delivery, and postpartum care.
- 2 The Maternal Fetal Simulator should be wireless, high fidelity simulator with an automated delivery mechanism and maternal aesthetics like a real patient.
- 3 The birthing mechanism should be noiseless for realistic labour.
- 4 Should have validated integrated maternal-fetal physiological and pharmacological modeling.
- 5 All maneuvers & interventions should result in appropriate patient response automatically based on underline physiology of patient without any input from the instructor
- 6 Birthing simulator should includes a birthing fetus and a second fetus especially designed for Leopold's maneuvers without connection ports on the head or buttocks.
- 7 Should be fully wireless with on-board fluids, pneumatics, and electrical systems
- 8 Should include software licenses to support scenario writing and editing on any computer
- 9 Maternal fetal simulator should have voice linked to labour and should allow upload of voice files in any local language
- 10 Simulator should support full maternal code as a non-gravid patient and should be supplied with non-gravid abdomen and scenarios for the same.
- 11 **Simulation should have following features**
 - i. Should have realistic birth canal with vulva/perineum supporting accurate fetal descent and rotation
 - ii. Should provide Multiple Birthing Positions: lithotomy, sitting, and all-fours
 - iii. Should allow vaginal examinations for evaluation of the cervix, fetal station, and position
 - iv. Should have static cervices representing various stages of dilation (closed to 10cm); effacement from 0-100%
 - v. Should have palpable uterine contractions which can be detected by palpating the fundus
 - vi. Should have facility to allow Instructors to control the rate and duration of contractions
 - vii. Birthing fetus should not have any connection port at the head or buttocks for realistic presentation during both vertex and breech deliveries
 - viii. Fetus/baby should have open mouth for meconium removal & cyanosis treatment
 - ix. Should have a customized fetus for Leopold's Maneuvers with hard head and soft buttocks
 - x. Should support and detect McRoberts Maneuver
 - xi. Should have observable pelvic which should be registered in event log
 - xii. Should support and detect suprapubic pressure with palpable symphysis pubis
 - xiii. Obstetric maneuvers like McRoberts Maneuver, suprapubic pressure rotation of anterior and posterior shoulder should be detected and logged in event loop to debriefing purposes
 - xiv. Should simulate realistic shoulder dystocia due to realistic pelvic bone movement and it should be resolved once posterior arm is extracted
- 12 Internal rotations with detection
 - a Should support delivery of posterior arm during shoulder dystocia
 - b Should allow Zavanelli maneuver with detection and logging in event log
 - c Trendelenburg position with detection and logging in event log
 - d Left lateral tilt with detection and logging in event log
 - e Vertex and breech delivery with no exposed metal parts
- 13 Should have Fetal heart sounds – 4 locations based on fetal presentation
- 14 Should have Articulated fetal body neck (with lateral neck movement), shoulders, elbows, hips, and knees
- 15 Should have clinically accurate fetal size with tactile realism – 5th percentile on the WHO growth chart
- 16 Fetus with palpable fontanel and sagittal suture
- 17 Should allow Forceps application
- 18 Should allow Vacuum extraction without fetal cap

- 19 Should provide fetal neck traction graph to give real time feedback on force applied during vacuum or forcep delivery
- 20 Should allow Fetal airway suctioning
- 21 Fetus should have audible cry upon delivery
- 22 Should display predicted 1-minute and 5-minute APGAR scores based on integrated maternal-fetal physiology
- 23 Should simulate postpartum hemorrhaging, including Class III hemorrhage
- 24 Should allow for assessment of uterine atony (Contracted vs. Boggy Uterus)
- 25 Should have facility bimanual compression and uterine massage detection
- 26 Should exhibit
 - i. Uterine blood released upon massage
 - ii. Uterine massage should automatically decrease rate of blood flow
 - iii. Uterine massage compression effect
 - iv. Uterine reversion
- 27 Should support placing an Intrauterine balloon
- 28 Umbilical cord can be cut and clamped
- 29 Episiotomy should be possible
- 30 Should have Intact/fragmented placenta with realistic color, texture and flexibility, placenta can be delivered with gentle traction
- 31 Should have an epidural port for realistic infusion and aspiration
- 32 Should allow to recognize sign for emergency C-section for team training of C- Section.
- 33 **Mannequin should have following clinical features**
 - a. **Respiratory**
 - i. Manikin should have realistic upper airway with airway management
 - ii. Should have Advanced lungs with mechanical ventilation support
 - iii. Should allows use of airway devices such as LMA
 - iv. Should Support endotracheal tubes, nasal-pharyngeal and oropharyngeal airways
 - v. Should display spontaneous breathing
 - vi. Should have bag-valve-mask
 - vii. Should exhibit lung sounds: anterior and posterior
 - viii. Should have realistic chest excursion & Exhalation
 - ix. Should allow positive pressure ventilation
 - x. Should have advance CPR matrices
 - b. **Circulatory System**
 - i. Should support real 4-lead ECG that can be connected to simulator
 - ii. Should display 12-lead ECG simulated in software
 - iii. Should have bilateral pulses: carotid, radial, and dorsalispedis; with controllable pulse strength
 - c. **Cardiovascular**
 - i. Should allow Chest compressions resulting in appropriate physiological changes.
 - ii. Should have advanced CPR metrics to measure the consistency of compressions and ventilations, as well as coronary and cerebral perfusion. Hand placement, chest recoil, and left lateral tilt should be detected and logged by the operating system.
 - iii. Should support electrical therapy (defibrillation)
 - iv. Should allow Bilateral NIBP measurement
 - v. Should have realistic Heart sounds linked to the physiology of the patient.
 - d. **Nervous System**
 - i. Should simulate seizures with rhythmic movement of arms, rapid blinking, and jaw movement
 - ii. Should have Reactive pupils
 - iii. Should have facility to change the colour according to condition of the patient like yellow for jaundice, red in case of blood clot
 - iv. Should have Blinking eyes
 - v. Should have live and pre-recorded speech and should also have ability to import customized vocal sounds into system software

e. Fluids

- i. Should have inbuilt postpartum bleeding tank at-least (1,800 ml)
- ii. Should have Bilateral IV arms with realistic flashback
- iii. Should have Urinary catheterization

34 Patient Profiles & Scenarios

- a Should be supplied with preprogrammed patient profiles with system software to write patient profiles as per training needs
- b Should be supplied with pre programmed clinical scenarios (at least 20 nos.) with system software to modify existing scenario & write new scenarios as per training needs
- c Pre programmed clinical scenarios for gravid patient should include:
 - i. A normal delivery
 - ii. An instrumental vaginal delivery
 - iii. Fetal Tachycardia due to Maternal Pyrexia
 - iv. Maternal cardio-respiratory arrest
 - v. Fetal central nervous system depression by narcotics given to the mother
 - vi. Eclampsia
 - vii. Major post-partum hemorrhage due to uterine atony
 - viii. Breech delivery
 - ix. Shoulder dystocia
 - x. Umbilical cord prolapse

35. Urgent Obstetric simulated clinical Experiences (SCEs)

- i. Anaphylactoid Syndrome of Pregnancy
- ii. Chronic fetal Hypoxia Associated with Placental insufficiency
- iii. Oxytocin induced uterine tachysystole
- iv. Repetitive deceleration caused by umbilical cord compression
- v. Uncontrolled gestational diabetic
- vi. Fetal Heart rate signal loss
- vii. Inadvertent monitoring of maternal heart rate
- viii. Major placental abruption
- ix. Maternal hypotension follow Epidural Block
- x. Maternal Sepsis

36 Pre programmed clinical scenarios for non-gravid patient should include :

- i. a Chronic Heart failure exacerbation
- ii. b. Acute Respiratory Distress Syndrome
- iii. c Sepsis with Hypotension
- iv. d. Brain Attack with Thrombolytic Therapy
- v. e Motor Vehicle Collision with Hypovolemic Shock

37 Should be supplied complete with

- i. a Wireless maternal mannequin - 01 no.
- ii. b Software License - 04 nos.
- iii. c Fetus for Leopold's maneuvers - 01 no.
- iv. d Abdominal for labor - 01 no.
- v. e Abdominal for Post Labor - 01 no.
- vi. f Static cervices for vaginal examination - 01 set
- vii. g Instructor wireless laptop – 01 no.
- viii. h Simulated CTG Monitor – 01 no.
- ix. I Delivery Table- 01

SPECIFICATION FOR LAPAROSCOPIC SIMULATOR**1. Laparoscopy Simulator should have the following:**

- i An easily movable cart with Powered Adjustable height, it moves up or down based on the surgeons height preference.
- ii Simulator must have the facility to Adjustment Base Position.
- iii 24" flat panel monitor that can be tilted for ease of viewing.
- iv Comprehensive performance evaluation Matrix.
- v Two trocars instruments with 6 degrees of freedom and multiple tool selections.
- vi Original Haptic Device with 5 Degrees of freedom.
- vii An additional instrument the Camera: 0, 30 and 45 degree lens angles.

2. Should be supplied with following modules :-**A Essential Skill Module**

- i Camera Navigation
- ii Peg Transfer
- iii Cutting
- iv Clipping

B Procedural Skill Module

- i Adhesiolysis
- ii Running the Bowel Module

C Suturing and Knot Tying Module**1 Essential Skills****I) Needle Driving**

- a Multiple techniques for adjusting the needle orientation
- b Forehand and backhand as well as left hand and right hand driving skills
- c Adjust parameters to increase or decrease the degree of difficulty and to create own curricula using the model provided

2. Knot Tying

- I) Appropriate suture behavior and software that detects number and direction of wraps
- II) Extensive knot recognition algorithms
- III) Practice knot tying with a needle on or pulled off the suture

3. Procedural Skills

I) Simple Interrupted Stitch

II) Continuous Stitch

III) Horizontal Mattress Stitch

a. Allows the user to practice different stitches using a model that has an external and internal surface

b. Adjust the parameters to increase or decrease the tissue stiffness as well as tissue sensitivity to injury

c. Integrates the needle driving and knot tying skills and allows various techniques to close an enterotomy

4. Loop Ligation

I) Allows the user to practice the placement of a loop around a vessel

II) Adjust the parameters to increase / decrease blood flow from the vessel as well as adjust the orientation of the vessel

III) Markers and metrics can be adjusted to increase or decrease the level of accuracy to place the loop

D General Surgery Procedures Module

1. Laparoscopic Cholecystectomy

I) Realistic anatomical deviations

II) Multiple cases from easy to different level of difficulties'.

E. Complete procedure including total dissection

SPECIFICATION FOR ULTRASOUND SIMULATION

The ultrasound simulation lab should have following specification

1. Diagnostic Ultrasound Simulator must have the following Basic Equipments:

- i. Mannequins - One male torso for Abdominal & Lung scanning and one female torso for Abdominal (With baby template) & Transvaginal scanning
- ii. Computer - Including keyboard, mouse, cable and screen
- iii. 21" TFT monitor
- iv. CPU
- v. Transducers - Curvilinear Abdominal/Lung for male torso & Curvilinear & Transvaginal for female torso

2. Should be supplied with following Training Modules:

- i. Pleural module (Lung and pleural module includes animated lung respiration and respiratory variation in the IVC)
- ii. Abdominal and FAST (focus assessment with sonography for trauma) module to see the fluid around several organs in the abdomen includes the perihepatic space, the perisplenic space, the pericardium and the pelvis.
- iii. Obstetrics & Gynecology abdominal module with baby template for 1st and 2nd trimester.
- iv. Endovaginal module to perform Obstetrics & Gynecology ultrasound examination

3. Should be supplied with two Mannequins:

- a) Male mannequin: realistic tactile features, depressible abdomen, palpable ribs and sternum, depressible interspaces.
- b) Female mannequin with realistic tactile features for abdominal & transvaginal examination.

4. The System should have the following specification for male ultrasound scanning

- i. 3D animated augmented reality feature which shows ultrasound beam and target structures.
- ii. Split screen display with corresponding 2D image.
- iii. Realistic scanning environment (Apart from heart it should render the liver, pancreas, spleen, ribs, sternum, superior and inferior vena cava, aorta, lungs and vertebral bodies).
- iv. Surrounding anatomical structures (i.e. liver, lungs, and sternum artifacts) should be displayed and may be toggled on and off depending on learner's level of comfort.
- v. Software should include tutorial features to help users identify anatomical structures on augmented reality display.
- vi. Possibility of heart rate modification in real time should be there.
- vii. Should include single lead ECG tracing.
- viii. Target cut plane feature allowing visualization of correct probe positioning.
- ix. Matrix for evaluation of sonographer's performance.
- x. 3D view including animated display of organ being scanned, surrounding structures, and 360° view
- xi. Lung and rib artifacts toggling on/off features.
- xii. Ability to load pathologies in stealth mode to hide the name of the pathology from learners
- xiii. Software should include tutorial feature to help users identify anatomical structures
- xiv. Software should include supporting content for pathologies such as case presentations, medical references.
- xv. Intuitive instructional content menu with self directed learning exercises including probe movement should be provided
- xvi. Feature of exporting metrics, reports, images, and video captures to a USB storage device
- xvii. Mannequins should have ability to be placed in the tilted left lateral decubitus position.

5. The System must have the following features for Obstetrics &Gynecology scanning:

- i. Ability to date a pregnancy, estimates the amount of amniotic fluid, and detects structural abnormalities (birth defects).
- ii. Ability to load pathologies in stealth mode to hide the name of the pathology from learners
- iii. Augmented reality display should include interactive, animated 3D anatomical depiction of organs, structures and abnormalities.
- iv. Ability to view high resolution, real-time ultrasound images simultaneously with 3D anatomical images in split screen mode.
- v. Visual display of surrounding anatomical structures: fetus veins and arteries, mother's bladder, mother's bones, mother's intestine, umbilical cord, placenta, uterus and skin should be possible.
- vi. Ability to toggle on/off structures from the augmented reality display.
- vii. Ability to change the position of the fetus.
- viii. Target cut planes feature allowing visualization of correct probe positioning.
- ix. Metrics to assess competency and for research purposes.
- x. Feature of exporting metrics, reports, images, and video captured to a USB storage device.

6. System must have following Lung and Pleural Pathologies:

- i. Bilateral Diaphragmatic Dysfunction
- ii. Bilateral Pulmonary Edema
- iii. Central Pneumonia
- iv. Gross Pleural Effusion
- v. Empyema
- vi. Pneumonia
- vii. Pneumothorax
- viii. Small Pleural Effusion
- ix. Unilateral Diaphragmatic Dysfunction

7. System must have following Abdominal Pathologies:

Normal Abdomen, Normal, Enhanced Heart and Lungs, Free Fluid - Hepato-Renal Reflection (Morrison's Pouch - Small), Free Fluid - Retro-Vesical Reflection (Large), Free Fluid - Splenal-Renal Reflection (Medium), Acute Cholecystitis, Angiomyolipoma, Bacterian Hepatic Abscess, Cholecystitis with Gallstone, Choledocolithiasis, Exophytic Renal Cyst, Hepatomegaly, Kidney Stones, Pancreatic Pseudocyst, Splenomegaly, Chronic Pancreatitis, Gallbladder Polyp, Hepatic Haemangioma, Hepatic Heterogeneous Metastases, Hepatic Homogeneous Metastases, Hepatic Steatosis, Large Gallbladder Polyp, Renal Cyst, Splenic Cyst, Splenic Haemangioma, Bochdalek Hernia - Left Side, Cholelithiasis, Gallstones, Hepatic Cirrhosis with Portal Hypertension, Liver Hepatoma, Heterogeneous Lesion, Pancreatitis, Pyelonephritis, Renal Abscess, Renal Cyst Rupture, Sclerosing Cholangitis, Adenocarcinoma of the Gallbladder, Bochdalek Hernia, Calcified Granulomas, Focal Nodular Hyperplasia, Hepatic Cirrhosis, Hepatic Cirrhosis with Ascites, Left Hydronephrosis, Liver Adenoma, Liver Hepatocellular Carcinoma Hyperechoic, Liver Hepatoma Hyperechoic Lesion (Large), AAA - Medium Suprarenal, AAA - Small Renal, AAA - Medium Renal, Left Iliac Artery Aneurysm, Each AAA pathology has the following modality options that can be turned on and off: Digestive system gas, Dissection, Free fluid, Mural Thrombus, Pericardial Fluid

8. System must have following Focussed Assessment with Sonography for Trauma (FAST) Pathologies:

Free Fluid - Retro-Vesical Reflection (Small) , Free Fluid - Retro-Vesical Reflection (Medium), Free Fluid - Splenal-Renal Reflection (Small) , Free Fluid - Supra-Splenal, Free Fluid - Above the Spleen

with Hemothorax, Free Fluid - Bilateral Renal Reflection (Small), Free Fluid - Hepato-Renal Reflection (Morrison's Pouch - Large), Left Lateral Trauma, Spleen Rupture, Small Pericardial Effusion

9. System must have following Pathologies for Curvilinear & Transvaginal Probe:

a Pathologies for 8- Week Fetus

Normal Fetus, Bicomuate Uterus, Blighted Ovum, Cesarean Scar, Dermoid, Ectopic Pregnancy, Enlarged Corpus luteum Cyst, Fetal Demise, Intrauterine growth retardation, Intrauterine Device, Molar Pregnancy, Subchorionic Hematoma, Twins Dichorionic-Diamniotic, Twins MonochorionicDiamniotic, Twins Monochorionic-Monoamniotic

b Pathologies for 12- Week Fetus

Normal Fetus, Nuchal Translucency 2.8 mm, Nuchal Translucency 3.2 mm, Nuchal Translucency 4.7 mm, Nuchal Translucency 5.5mm Hygroma, Nuchal Translucency 9.5 mm Hygroma

10. System must have Pathologies for Curvilinear Probe Only :

a Pathologies for 20- Week Fetus

Choroid Plexus Cyst – small, Choroid Plexus Cyst – large, Cleft Lip and Palate, Cleft Palate, Cloacal Bladder Extrophy, Dandy Walker Syndrome, Esophageal Atresia, Fetal Growth Retardation - Shortened Femurs, Gastroschisis, Renal Agenesis, Mega-Cisterna Magna, Multicystic Renal Dysplasia, Nasal Bone Absence, Nasal Hypoplasia, Oligohydramnios, Omphalocele, Polyhydramnios, Renal Pelvis Dilation, Unilateral Club Foot, Bilateral Club Foot

b Realistic Echo Environment:

Electronic callipers, Area measurements, Contour Measurement, Circumference Measurement, Gain and contrast settings, Depth of field adjustment, Angle Settings

c Downloadable Software upgrades:

- Capable of downloading automatic software updated from the central server.
- Must be upgradable to TTE&TEE Module.

11. Ultrasound based Interventional Simulation Models

- i. These should be compatible with ultrasound imaging system with appropriate transducers.
- ii. They should not require special storages.
- iii. They should not dehydrate or decompose over time.
- iv. Special storage case should be provided for all models.
- v. Refill solutions wherever required should be provided for atleast 1000 procedures unless otherwise specified.
- vi. All the interventional models should be compatible with any make of ultrasound machine.
- vii. Pricing for consumable must be quoted separately for future purchase.
- viii. Company must supply the sufficient fluid for interventional modules at least for 1000 procedures.
- ix. Company should have sufficient spares locally to maintain the up time.

12. Should be supplied with following interventional simulation models

1 Ultrasound central line training model

- i. Model should have ultra-durable tissue should be realistic in ultrasound imaging characteristics, feels and cannulates like real human tissue
- ii. Should be realistic central venous access ultrasound training model excellent for training radiologists in the psychomotor skills associated with ultrasound guided central venous access procedures
- iii. Should have ultra-durable self-healing tissue, extremely realistic in ultrasound imaging characteristics and feels like real human tissue
- iv. Should contain anatomically correct vascular anatomy of the right upper thorax and neck including internal jugular vein, brachiocephalic vein, subclavian vein, axillary vein, carotid artery, subclavian artery, and axillary artery as well as anatomical landmarks including the trachea clavicle the two head of the sternocleidomastoid muscle manubrium and the sterna notch
- v. Positive fluid flowing the vessels should provide users with immediate feedback when vessels are accessed
- vi. Simulated blood fluids in the arterial vessels should differ from the venous system allowing for user to easily verify successful venous access procedures
- vii. Tissues should match the acoustic characteristics of real human tissue.
- viii. Arterial pulsation are simulated using a provided integrated automated pumping system
- ix. Replacement part should be supplied for at least 1000 procedures.

2) Femoral Vascular Access Lower Torso Ultrasound Model with DVT Option

- i. Realistic and ultra durable femoral vascular access ultrasound training model excellent for radiologists in the psychomotor skills associated with ultrasound guided procedure
- ii. Superb ultrasound imaging characteristics
- iii. Ultra-durable self healing tissues which should be realistic in ultrasound imaging characteristics and feels like real human tissue
- iv. Anatomically correct vascular anatomy of the right lower torso including the femoral artery and vein should be provided.
- v. Anatomical landmarks of the lower torso should be there.
- vi. Ability to use traditional anatomical landmarks for blind insertion techniques, or ability to use ultrasound to obtain images of anatomical structures
- vii. Should allow full threading of guidewires and catheters
- viii. Venous and arterial fluids that are removed during central catheter insertions training should be easily refilled using quick fill ports
- ix. Arterial pulsations system should be simulated using an integrated automated pumping system
- x. Positive fluid flow in the vessels should be there.
- xi. Simulated blood fluids in the arterial vessels should be different from the venous system.
- xii. Tissues should match the acoustic characteristics of real human tissue.
- xiii. Deep Vein Thrombosis (DVT) option should be provided.
- xiv. Replacement part should be supplied for at least 1000 procedures.

3) Peripherally inserted central catheters (PICC) with Intravenous and Arterial Line Vascular Access Ultrasound Training model.

- i. Realistic and ultradurable central venous access ultrasound training model excellent for training radiologists in the psychomotor skills associated with ultrasound guided vascular access procedures
- ii. Ultra-durable self-healing tissue realistic in ultrasound imaging characteristics and feels cannulates like real human tissue
- iii. Contains the brachial and basilic veins, brachial artery, radial artery, ulnar artery medial cubital v, and the cephalic vein
- iv. Superb ultrasound imaging characteristics
- v. Positive fluid flowing the vessels to provide users with immediate feedback when vessels are accessed
- vi. Easy to refill simulated vessels
- vii. Tissues match the acoustic characteristics of real human tissue
- viii. Replacement part should be supplied for at least 1000 procedures.

4) Spinal Epidural, lumbar Puncture and Thoracic Epidural Training Model

- i. Model for training for lumbar puncture, lumbar epidural and thoracic epidural procedures.
- ii. Should be excellent for blind insertion techniques or using ultrasound for guided lumbar puncturedspinal epidural procedures
- iii. Needle access as well as the placement of catheters should be possible.
- iv. Ability to position in the upright or lateral decubitus position allowing users to accurately position the model for appropriate training scenarios
- v. External landmarks as the iliac crests should be there in the model to initially orient the user to the proper access points
- vi. Palpation of the spinous processes should be possible.
- vii. The accessory obese spinal insert should provide more adipose tissue disallowing the palpation of thespinal processes
- viii. Should be able to utilize for full procedural training including injecting local anaesthetics, intriduce the needle to the epidural space and/or subarachnoid space, thread catheters, infuse simulated anaesthetics, and obtain manometer measurements
- ix. Ultrasound can be used for identification of the optimal insertion points, angle of needle insertion, determination of the depth to the ligamentumflavumepidural space and spinal cistern
- x. Should have ultra durable self-healing tissue realistic in ultrasound imaging characteristics andfeels like real human tissue
- xi. Replacement part should besupplied for atleast 1000 procedures

5) Renal Biopsy Ultrasound Training Model

- i. Model for training radiologists in the psycho-motor skills associated withultrasound guide kidney biopsy procedure
- ii. Anatomically correctadult male torso with an ultrasound tissue module containing skin, ribs and right kidney with surrounding tissue
- iii. Ultrasound imagingcharacteristics should contain the renal cortex, renal medulla and major and minor calyces.
- iv. Superb ultrasoundimaging characteristics: extremely realistic in ultrasound imaging characteristics extremely realistic in ultrasound imaging characteristics and feels like real human tissue.
- v. Ultra-durable, self-healing tissue.
- vi. Ability to remove atleast 30 core biopsy samples before the kidney requires replacement
- vii. Easy to reposition or replace kidney as necessary after significant core biopsy use
- viii. Ultrasound tissue match the acoustic characteristics of real human tissue.
- ix. Replacement part should be supplied for atleast 200 procedures

6) BREAST ELASTOGRAPHY AND BIOPSY TRAINING MODEL (SEPARATE MODELS MAY BE PROVIDED, IF REQUIRED).

- i. Model should contain a broad range of elastic and available echogenecity masses including stiff, soft, as well as isoelastic lesions - all in the same model.
- ii. Different echo textures that are hypoechoic, isoechoic, as well as echogenic (hyperechoic) should be provided.
- iii. Variable sized masses, range in size upto 1 cm or more.
- iv. Should be for B-mode ultrasound imaging as well as elastography ultrasound imaging
- v. Self-healing tissue should be there.
- vi. Excellent for developing and refining the psychomotor skills associated with breast elastography ultrasoundprocedures
- vii. Ability to target both small and large masses. Breast lesions should be present in both the central breast tissue as well as the Tail of Spence
- viii. Ability to inject fluid into the model to verify needle tip location (automatically expelledFeels and biopsies like human tissue
- ix. Extremely durable, ability for repeated training
- x. Should be capable for atleast 1000 procedures

7) SOFT TISSUE BIOPSY ULTRASOUND TRAINING BLOCK MODEL

- i. Model for developing and refining the psychomotor skills associated with ultrasound guide soft tissue biopsy procedures
- ii. Contains a variety of masses that are hyperechoic, hypoechoic, and echolucent allowing users to gain experience utilizing a wide range of lesions as they would experience in the clinical environment
- iii. Contains more than 15 masses of varying sizes upto 1 cm or more allowing users to develop their skills starting with larger lesions and target smaller masses as their skills progress
- iv. Ultra-durable design.
- v. Self-healing tissue
- vi. Masses should be present randomly throughout the simulated human tissue
- vii. Ability to inject fluid into the model to verify needle tip location (automatically expelled)
- viii. Convex surface contour offering a scanning environment similar to human body habitus
- ix. Should be capable for atleast 1000 procedures

8) MIDSCAPULAR THORACENTESIS ULTRASOUND TRAINING MODELS

- i. Model for training radiologists in the psycho-motor skills associated with ultrasound thoracentesis procedures
- ii. Model should contain the chest wall superficial tissue, 6th, 7th, 8th, and 9th ribs intercostals spaces, pleural cavity with lung and atelectatic lung, diaphragm, and superior spleen.
- iii. Superb ultrasound imaging characteristics: extremely realistic in ultrasound imaging characteristics, should feel like real human tissue
- iv. Ultrasound tissue should ultra-durable with self-healing tissue
- v. Positive fluid flow should be there when pleural effusion fluid is being accessed.
- vi. Pleural fluid that is removed during thoracentesis procedural training should be easily refilled using a quick fill port - or automatically using I.V.
- vii. Replacement parts should be supplied for atleast 1000 procedures.

9) Peripheral Doppler ultrasound training models

- i. 2D and Doppler flow characteristics
- ii. Excellent for learning and teaching methodology of ultrasound for the assessment of peripheral arterial and venous blood flow
- iii. Compatible with any ultrasound system configured with Doppler ultrasound capability
- iv. Ability to utilize a variety of Doppler techniques to assess the vascular structures in the model including color Doppler (color power doppler, and continuous wave Doppler
- v. User defined pulsatile or continuous blood flow settings.
- vi. Contains the brachial and basilic vessels of the upper arm as well as the radial and ulnar arteries and the cephalic and median cubital veins of the lower arm
- vii. There should be a consistent and repeatable training environment
- viii. Ability to train user in ultrasound guided vascular access procedures
- ix. Ability to repeatedly cannulate all vessels and offers extremely realistic and durable performance
- x. Self healing tissue should be provided with atleast 1000 cannulations without replacement

10 Foreign body identification ultrasound training model

- i. Should be ultra-durable tissue and should be realistic in ultrasound imaging characteristics and feels like real human tissue
- ii. Ability to train radiologist to develop and practice ultrasound guided foreign body identification, targeting, and retrieval skills
- iii. Uncompromising image quality for multiple procedures.
- iv. Should have convex surface contour which offers a scanning environment similar to human body habitus
- v. Should contain a wide variety of foreign bodies dispersed throughout the model at different depth and positions include:
- vi. Metal projectile bullets / bodies
 - a. Metal shrapnel fragments
 - b. Wooden splinters

- c. Metal Needles
- d. Large Glass fragments

vii. Replacement part should be supplied for atleast 1000 procedures

11) Paediatric 4 vessel ultrasound training block model

- I. Model should be ultra- durable and realistic simulated human tissue should be provided
- II. Should contain four branched vessels ranging in size from 2mm to 6mm
- III. Should have overlapping blood vessels which are perfect for new users as well as for more advanced technique training
- IV. Model should be pre filled with red simulated blood refill solution
- V. Should have the ability to inject fluid into the model to verify needle tip location automatically expelled
- VI. Ability to acquire and interpret imaging of vessels used for venipuncture
- VII. Replacement part should be supplied for atleast 1000 procedures

12 Combination and IUP and ECTOPIC pregnancy transvaginal ultrasound training model

- i. Realistic real time ultrasound imaging model.
- ii. Ist trimester intrauterine and ectopic pregnancy endovaginal ultrasound training model for training radiologists in the psychomotor and imaging skills associated with transvaginal ultrasound procedures.
- iii. Should have realistic external anatomy.
- iv. Should have internal anatomy with sonographically accurate endovaginal canal, bladder with bladder wall, cervix, uterus with intrauterine pregnancy, extrauterine pregnancy, endometrium, left and right ovaries, ovarian follicles, corpus luteum cyst, broad ligaments, maternal bowel and colon, free fluid in cul-de-sac and accessory structures.
- v. Both intrauterine and ectopic pregnancies should be complete with amniotic sac and placenta.
- vi. Should have excellent ultrasound imaging characteristics.
- vii. Should accurately mimic the feel and imaging characteristics of an actual endovaginal ultrasound exam .
- viii. Should be easy to clean, though not routinely necessary.
- ix. No replacement parts should be necessary.
- x. Excellent for 3D and 4D ultrasound imaging and reconstruction.
- xi. Excellent for validating clinical competency.
- xii. Should include privacy skirt.

13) Amniocentesis Ultrasound Training Model

- i. Model for developing, practicing, and validating the skills associated with ultrasound-guided amniocentesis procedures.
- ii. Ultrasound guided amniocentesis training model should contain realistic pelvic anatomy including a gravid uterus with a fetus of 18 week gestational age, umbilical cord with both fetal and placental cord insertions, anterior/anterolateral placenta, cervix, a variety of fluid pockets enabling users to begin training utilizing larger fluid pockets and work to develop their skills allowing them to guide needles to smaller pockets of amniotic fluid.
- iii. Should simulate patient of moderately sized body habitus allowing for a full range of skill development.
- iv. Should have externally accurate fetal anatomy allowing for 3 D ultrasound training.
- v. Ability to target small , medium or large fluid collections.
- vi. Should have superb ultrasound imaging characteristics.
- vii. Should have ultra-durable self healing tissue and feels like real human tissue.
- viii. Ultra-durable design should ensure repeatable results for atleast 1000 procedures.
- ix. Adjustable amniotic fluid volumes should be there.
- x. Easy fill port should be there for continuous infusion of simulated amniotic fluids.
- xi. Ability to easily refill fluids removed during training.
- xii. Should contain anatomical landmarks for the most realistic simulation training.

SPECIFICATION OF BABY SIMULATOR

Baby Patient Simulator for Training & Education of undergraduates, Post graduate students & Health professionals in routine and special clinical situations.

It should offer sophisticated mathematical models of validated human physiology and pharmacology and capable of determining automatically the patient's response to user actions and interventions:

It should be fully operational in supine position and can be placed on O. T. Table, ICU Beds and on ground.

Features:

1. Patient simulator should provide independent simulation of 3-6 months old male / female patient with interchangeable genital
2. Patient simulator should have bulging fontanel capability.
3. Patient Simulator should employ sophisticated mathematical models of human physiology and pharmacology which automatically determine the patient's response to user actions and interventions. With dynamic coupling of the cardiovascular, pulmonary and pharmacological models along with the physical embodiment of the mannequin, PATIENT SIMULATOR should automatically respond to clinical interventions according to underlying physiology of the patient without any interventions from the instructor.
4. Should have cardiovascular system that automatically calculates dependent variables (e.g., blood pressure, heart rate) in response to changing cardiovascular system status (e.g., bleeding, intravenous fluid administration).
 - a. Should have baroreceptor reflex model which should automatically compensate both centrally (e.g., heart rate, cardiac contractility) and peripherally (e.g., systemic vascular resistance, venous capacitance) to maintain circulation and perfusion.
 - b. Arterial blood gases (e.g., PaO₂, PaCO₂, and pH) and mixed venous gases (e.g., PvO₂, PvCO₂) which are automatically calculated.
 - c. Hematocrit which is automatically calculated to reflect oxyhemoglobin saturation and administration of a variety of intravenous fluids, such as whole blood, packed red cells, colloids, and crystalloids.
 - d. Should have complete hemodynamic monitoring package which includes the capability to measure and monitor the following:
 - i. Arterial blood pressure
 - ii. Left ventricular blood pressure
 - iii. Central venous pressure
 - iv. Right atrial pressure
 - v. Right ventricular pressure
 - vi. Pulmonary artery pressure (including "floating" the catheter from atmosphere to the pulmonary artery)
 - vii. Pulmonary artery occlusion (wedge) pressure
 - viii. Continuous Cardiac Output
5. Should have pulmonary system that automatically calculates alveolar and arterial gas partial pressures in response to ventilation, fraction of inspired oxygen, intrapulmonary shunt fraction, and metabolic gas exchange.
6.
 - a. During spontaneous ventilation, the patient mannequin should breathe with a spontaneously controlled respiratory rate and tidal volume to maintain normocarbia and adequate oxygenation.

- b. Apnea or hypoventilation should automatically result in hypercarbia, hypoxemia, decreasing oxyhemoglobin saturation, and tachycardia.
 - c. Positive pressure ventilation or return of spontaneous ventilation should automatically reverse apnea with the response appropriate to the rate and tidal volume of ventilation.
 - d. Should automatically respond to the fraction of inspired oxygen present, such as with smoke inhalation or supplemental oxygen.
7. Should have pharmacology system that automatically calculates both the pharmacokinetics and pharmacodynamics for intravenous medications, yielding appropriate changes in patient clinical signs and monitored parameters.
 - a. For example, a patient receiving a muscle relaxant should automatically yield hypoventilation, eyelid closure, decreased oxyhemoglobin saturation, and bradycardia. Positive pressure ventilation should stabilize the patient until the drug is metabolized and eliminated, yielding a return to spontaneous ventilation and stabilized vital signs.
 - b. All patient responses to the drug dosage should be automatic, dose dependent, and follow an appropriate time course.
 8. Patient simulator should provide objective evaluation of clinical performance of the student and patient outcome should be based solely on patient physiology and the treatment administered (e.g., ventilation, oxygen therapy, drug therapy).
 9. Should have a simulated monitor capable of displaying all of the following parameters.
ECG Leads I, II, III, V, Arterial Blood Pressure, Pulmonary Artery Pressure, Pulmonary Capillary Wedge Pressure, Central Venous Pressure, Pulse Oximetry Plethysmogram, Pulse/Heart Rate, Mean Arterial Pressure, SpO₂, Continuous Cardiac Output, Blood Temperature, Body Temperature, Non-invasive Blood Pressure
 - a. Alarm limits with accompanying sounds should be configurable for each parameter.
 - b. pulse/heart rate beep should be synchronous with the cardiac cycle, as monitored by the ECG, arterial blood pressure, or SpO₂.
 - c. For SpO₂ monitoring the cardiac sound pitch should correlate with oxyhemoglobin saturation.
 10. Should have a realistic airway (mouth, oropharynx, larynx, esophagus, trachea, carina)
 - a. Direct laryngoscopy as well as oral and nasal tracheal intubation can be performed
 - b. Should support Airway adjuncts (e.g., combitube, laryngeal mask airway) like a real patient without any special adjustments by the instructor
 - c. Should allow objective assessment of success or failure of airway management with the resulting ventilation, oxyhemoglobin saturation, and overall cardiopulmonary stability.
 11. Should have full trauma simulation capabilities, including support for:
 - a. Pneumothorax needle decompression on the right side of the mid clavicular line of the second intercostal space
 - b. Chest tube insertion (with fluid return) at the mid-axillary line of the 5th intercostal space
 - c. Each trauma capability should require minimal instructor input.
 - d. Should have fully independent left and right lungs.
 - e. One-sided pneumothorax can be simulated with chest distention on one side, with the other side rising and falling with spontaneous breathing.
 - f. Breath sounds should be independent and linked to ventilation of each lung for both spontaneous and mechanical ventilation.

- g. One-lung ventilation should automatically result in appropriate breath sounds, chest excursion, and pulmonary gas exchange.
 - h. Intra osseous insertion facility.
12. Should have independent blinking eyes and adjustable pupils. Eye blinking should be automatic and dependent on the underlying patient physiology (i.e., level-of-consciousness, level of neuromuscular blockade).
13. Patient simulator should simulate tearing and secretions of fluids from ears, eyes and mouth.
14. Patient simulator should have bi-lateral palpable pulses in the following locations:
- a. Brachial
 - b. Femoral
15. Patient Simulator should have an advanced cardiac life support system in which:
- a. Effective chest compressions automatically yield artificial circulation, cardiac output, central and peripheral blood pressures, palpable pulses, and exhaled CO₂.
 - b. Ineffective chest compressions yield inadequate cardiac output and circulation and an absence of exhaled CO₂.
 - c. Defibrillation energy is automatically identified, quantified, and logged
 - d. Pacing current is automatically identified, quantified, and logged, with appropriate physiological response.
16. a. Should have facility to create any patient with any clinical scenario, creating a wide variety of clinical care simulations.
- b. should have facility to run multiple patients simultaneously to create multi-patient care simulations.
- c. Should have facility to run multiple injury/disease scenarios simultaneously on a particular patient to create multi-trauma simulations.
17. Should have educationally complete clinical simulations including:
- a. Clinical background and scene
 - b. Pre-hospital and emergency department learning objectives
 - c. Student critical actions
 - d. Simulation algorithm
 - e. Equipment required for the simulation
 - f. Instructor notes
18. Patient simulator should have wireless instruction laptop workstation for flexibility of use, to communicate from a distance upto 150 feet away from mannequin
19. Should have provision of main control software and the waveform display on a single instructor workstation laptop computer.
20. Delivery should include onsite training on fundamentals of setup and operation.
21. Should be supplied with Hospital Bed

SPECIFICATION FOR VARIOUS TASK TRAINERS**1. SPECIFICATION FOR ALL PURPOSE PATIENT CARE SIMULATOR**

A Should have following features:-

- a. With one normal eye and the other dilated;
- b. Face & hair cleaning; Oral hygiene;
- c. Oral and nasal intubation and suctioning; OG /NG tube insertion and lavage/gavage
- d. Tracheostomy care and suctioning;
- e. Heart, breath and bowel sounds;
- f. Blood pressure measurement skills;
- g. IV care and management; Realistic "pop" as needle enters vein;
- h. Should have highly lifelike adult arms with realistic skin. The needle can be fixed by transfusion plaster;
- i. Should have Intramuscular injection sites at arm, thigh, and buttock;
- j. Should have capability for Ostomy irrigation and care;
- k. Should have Interchangeable male/female pudendum;
- l. Should allow practice Catheterization skills; Enema administration;
- m. Should be supplied with bedsore care module (wearing type)
- n. Should allow various positions for Postmortem care; Changing hospital gowns; Perineal care; Cold and heat therapy;
- o. Should have true-to-life motion range of all joints allows for correct patient positioning and flexibility exercises.

B The Manikin's Articulations should Include:

- a. Trunk — rotation, hyperextension
- b. Shoulder — abduction, adduction, rotation, hyperextension
- c. Elbow — extension, flexion, pronation, supination
- d. Wrist — flexion, hyperextension, radial flexion, ulnar flexion
- e. Neck — rotation, hyperextension, lateral flexion
- f. Hip — abduction, adduction, rotation, hyperextension
- g. Knee — extension, flexion
- h. Ankle — eversion, inversion, dorsiflexion, plantarflexion
- i. Positioning variety of decubitus

C. Should be supplied with two Standardized Modules:

1. BP Module :

- a. Experience vivid blood pressure measuring training with real stethoscope and sphygmomanometer;
- b. Accuracy: 1mmHg;
- c. Adjustable range: 0~300mmHg;
- d. Digital Korotkoff's sound;
- e. Systolic and diastolic pressure can be adjusted respectively;
- f. Adjustable pulse rate and volume with clear sound;
- g. Systolic & diastolic pressure, volume and heart rate can be displayed on the LED screen simultaneously. There is also mercurial gauge denoting change of blood pressure;
- h. Low power consumption. Automatically shut down after ten minutes of non-operation.

2. AUDIO Module

- a. 54 normal and abnormal heart, breath and bowel sounds, as well as patient's voices for selection;
- b. User-friendly interface, very easy to operate;
- c. Five different kinds of sounds can be exported simultaneously, and the volume is adjustable;

d. All sounds can be heard by earphone or sound box.

D. Should be supplied with :-

- a. Standard All-purpose Patient Care Simulator 1
- b. BP module 1
- c. AUDIO module 1
- d. IV training arm 1
- e. Bedsore module 1
- f. Simulated bladder 2
- g. Simulated colon bag 2
- h. Simulated lungs 2
- i. 14 # Catheter 1
- j. anal tube 1 & Clothes 1

(2) SPECIFICATION OF ADVANCE NURSING SIMULATOR

1. Should have contemporary aesthetic, Easy to Use, true mobility, wireless and tether less manikin
2. Should have Two Platforms in one (Easy to convert from Female to Male) for teaching and training Nursing students.
3. Manikin must have the following Clinical Skills Features :-
 - i. Anatomically accurate landmarks for realistic clinical skills practice
 - ii. Realistic articulation to promote proper patient handling
 - iii. Eyes and ears accommodate irrigation procedures or medication administration with Real fluids
 - iv. Open pliable nares allowing for nasal packing, insertion of nasopharyngeal airways, Nasal cannula and NGT placement
 - v. Open mouth allows for realistic oral and denture care, placement, securing and care of oral airways, endotracheal tubes and gastric feeding tubes
 - vi. Realistic tracheostomy site allows for tracheostomy care and procedural suctioning with real fluids
 - vii. Chest tube port for care and maintenance
 - viii. Accommodates oxygen delivery methods with realistic chest rise with use of BVM
 - ix. Gastric lavage and gavage with real fluids
 - x. Pulses include manually generated carotid pulse, (electronically generated brachial and radial pulse)
 - xi. ECG posts for lead placement
 - xii. Subclavian hole for placement of triple lumen catheter for care (without fluid administration)
 - xiii. Configurable stomas for ostomy care and irrigation
 - xiv. Urinary catheterization with real fluid return
 - xv. Enema procedures capable with real fluids
 - xvi. IM injections and medication administration via deltoid, gluteal and vastuslateralis muscles.
 - xvii. Articulating, easy-to-maintain, IV arm with replaceable IV pucks allowing for IV placement, Site care and fluid administration
4. Simulator should have Sounds and rhythms for patient diagnoses and assessment
 - i. Various heart sounds, rates, rhythms and volume
 - ii. Programmable ECG generation
 - iii. Various lung sounds and controllable respiratory rate.
 - iv. Korotkoff sounds generated with programmable NIBP arm
 - v. Various programmable bowel sounds
 - vi. Vocal sounds – software generated
 - vii. Two-way communication generation between manikin and caregiver
5. Simulator should be designed in such a way that it can upright at his/her own to perform realistic examination as in case of a real patient.
6. Simulator internal structure should be designed in such a way that all electronics part is separated completely from various fluid reservoirs so that to make more durable and easy for troubleshooting.
7. It should have facility to fill and drain all fluids externally without need of opening any part to refill fluids to make it ready for next training.
8. Simulator software should be embedded within itself so that it can be used with any available tablet or PC in the market.

9. Simulator must have the following in-built simulated clinical Experience for teaching and training students.
 - i. Chronic heart failure exacerbation
 - ii. Gastrointestinal bleed secondary to esophageal varices
 - iii. Skills validation
 - iv. Asthma management of patient in home care setting
 - v. Postoperative care of the patient with complications: pneumonia
 - vi. Suctioning and tracheostomy care with hypoxia
 - vii. Basic assessment of the hip replacement patient
 - viii. Postoperative care of the patient with a ruptured diverticulum
 - ix. Seizure disorder and moderate learning disability
 - x. Dementia and urinary tract infection in a patient with DNR orders.
10. Simulator must be supplied with:Wireless Manikin with electronics, Tablet PC, Conversion Kit from Female to Male. ,Women Health care module

(3) SPECIFICATION FOR ALL PURPOSE CARE & TRAUMA MANIKIN

- 1 Should have general trauma head to facilitates facial and cranial trauma assessment including an open depressed skull fracture, deviated trach, mandible fractures, and fracture of the C6 vertebrae, hematotympanum, dilated and normal pupils, and nasal fracture;
- 2 Trauma intubation head features should have an avulsed ear, lacerations of the eye, lip, neck and scalp, dilated and normal pupils, nasal bleeding, impaled object in cheek, broken teeth and face contusion;
- 3 Standard intubation head should manually generated carotid pulse: dilated and normal pupils;
- 4 Should have face and hair cleaning, oral hygiene & denture care; oral and nasal intubation; aspiration of oxygen; place nasal and oral gastric tubes; lavage/gavage, tracheostomy care and suctioning;
- 5 Should have following modules
 - a. Trauma wound modules: compound radius fracture, 1st, 2nd and 3rd degree burn face,
 - b. Hand with open fracture of index finger,
 - c. Exposed tendons and multiple lacerations (sleeve),
- 6 Abdominal module should have exposed viscera, forehead with open wounds, impaled object in thigh, compound femur fracture, closed fracture tibia and fibula (right), contused ankle and foot (left), and crushed foot with exposed bone and soft tissue and projectile wounds;
- 7 Should have bleeding Leg Model/Bleeding Arm Model: including 4 modules: amputated leg, trauma leg, amputated arm and trauma arm.
- 8 Should have artificial blood to simulate arterial pressure
1. **BP module:**
 - a. On the arm blood pressure measurement can be carried out with a real sphygmomanometer and stethoscope noninvasive blood pressure measurement ;
 - b. Should have a sound korotkoff Gap ;
 - c. mm Hg pressure display dynamic blood pressure value should be accurately set to 1 mm Hg ;
 - d. Facility to set the systolic, diastolic and pulse rate , systolic and diastolic blood pressure between 0-300mmHg continuously adjustable ;
 - e. The volume should be adjusted depending on the circumstances ;

- f. Should have systolic blood pressure, diastolic blood pressure, volume and heart rate simultaneously displayed on the LCD screen, analog Hg dynamic display, the process can be visually represent the cuff pressure changes ;
- g. Should have automatic calibration, low power consumption , standby 10 minutes after an automatic system shutdown , ordinary commercially available batteries can be used continuously for one semester or more ;

2. Audio module:

- a. Should have atleast 54 kinds of sounds, voice 21 kinds (such as: coughing , vomiting , sneezing , etc.) , atleast 14 kinds of heart sounds (eg : normal heart sounds, sinus bradycardia, systolic murmur , etc.),breathsounds atleast 13 kinds (eg : normal alveolar breath sounds , the blisters , the coarse moist rales , etc.),abdominal sounds atleast six kinds (eg : normal bowel sounds , decreased bowel sounds , fetal heart tones,etc.) ; sounds kind of unlimited expansion
- b. Should have graphical user interface visually, easy to operate
- c. Should have Rd sound to play simultaneously, should have any combination of the state of play and a corresponding prompt ; volume is divided into eight stalls , each individually adjustable ;
- d. Should have bilingual interface, large screen LCD ;
- e. Should have all external speakers can also connect headphones selfteaching, but also through the human body model extroverted ;

- 9. Supplied complete with:**Standard All Purpose Care & Trauma Manikin, Trauma care modules, AUDSim module (optional), BPSim module (optional), Bleeding arm & leg model, Trauma intubation head, Standard intubation head, Interchangeable vulva , Pump bulb

(4) SPECIFICATION FOR ADVANCE ADULT CPR

1. It should be a state of the art Torso CPR model having full CPR training for the educational experience of CPR procedures which enhances the confidence of the user on the real patients.
2. The model should enable trainees to learn the techniques to be used in response to real patients' conditions.
3. Should provide maximum Individual student face masks with a one-way non-rebreathing valve and disposable airways (20 in number) for protection against cross contamination.
4. It should have provision for the following features:
 - a. Palpable anatomical landmarks like xiphoid, navel, nipples and rib cage.
 - b. Fully articulated head, neck and jaw.
 - c. Palpable carotid pulse.
5. The Display Monitor should also have in-built printer for printing data of each training session.
6. It should be capable for child CPR by changing the supplied springs along with the model.
7. It should be provided with following accessories:
 - a. Child springs
 - b. 10 disposable lower airways
 - c. 10 disposable tracheal airways
 - d. 5 sanitary face masks
 - e. Carrying case

(5) SPECIFICATIONS OF ADULT LUMBAR PUNCTURE SIMULATOR

1. Should be left-lateral positioned with clear landmarks;
2. The lumbar should be removable to change spinous process;
3. Should allow the users to practice techniques including: lumbar puncture, epidural puncture, caudal analgesia, spinal analgesia, spinal sympathetic nerve block, combined spinal-epidural block, and SCF examination;
4. Correct injection should cause SCF to flow out;
5. The internal vessels and puncture pads should be replaceable.
6. Should be supplied complete with the following:Adult Lumbar Puncture Simulator , Lumbar puncture needle , Syringe, Liquid bag

(6) SPECIFICATIONS OF SPINAL INJECTION SIMULATOR

1. It should be such that the first lumbar vertebrae is visible, in order to enable observation of internal structure;
2. From the third down to the fifth lumbar vertebrae of the simulator should be the functional part;
3. The user should feel being blocked when inserting needles correctly;
4. Should be mounted on a base, and can be easily positioned in lateral and sitting position.
5. Should be supplied complete with the following:Spinal Injection Simulator , Liquid Bag

(7) SPECIFICATIONS OF MULTIPURPOSE TRANSPARENT LAVAGE MODEL

1. The manikin should be able to be postured into three positions: on the back, left lateral and sitting position;
2. Should reproduce anatomical structure including oral cavity, denture, tongue, epiglottis, larynx arytenoid, vocal cords, tracheal, bronchia, lungs, heart, esophagus, midriff,pancreas, liver, cholecyst, colon, small intestine;
3. Gastric Lavage training should include lavage via oral and nasal passage with stomach pump,electric aspirator, gastric tube and automatic gastrolavagemachine;Techniques including gastrointestinal decompression,gastric juice sampling, duodenum drain, balloon tamponade, gavage, aspiration of oxygen, oral hygiene,suctioning via oral and nasal passage, OP tube insertion should be practiced on the model;
4. The whole process from tube insertion to withdrawal through transparent cover should be observed
5. Should be able to Manually generate carotid pulse;
6. Both pupils can be shrunken to simulate symptom of phosphorus insecticide poisoning;
7. Should be able to drain out Lavage liquid conveniently.
- a. Should be supplied complete with the following:Multi-purpose Transparent Lavage Model , Gastrointestinal tube , Latex glove , Pump bulb

(8) SPECIFICATIONS OF ARTICULATING BLOOD PRESSURE TRAINER ARM

1. Should provide blood pressure measuring training with real stethoscope & sphygmomanometer;
2. Should have digital Korotkoff sounds
3. Should have Dynamic Hg indication of blood pressure with accuracy of 1mmHg
4. Systolic and diastolic blood pressures range should be from 0 to 300 mmHg which can be adjusted
5. Pulse rate should be adjustable
6. Volume should be adjustable to meet different teaching requirements
7. Systolic & diastolic pressure, volume and heart rate should be displayed on LCD Screen simultaneously
8. Should have Automatical calibration and low power consumption
9. The trainer arm should automatically shut down after 10-minute stand by status
10. Should be supplied complete with the following:

11. Articulating Blood Pressure Trainer Arm-Blood pressure controller –Sphygmomanometer

(9) SPECIFICATIONS OF KNEE FOR ASPIRATION

1. The manikin should represent normal anatomy precisely for palpation purposes;
2. Should have precise anatomical structure with bony landmarks including tibia, femoral skeleton, collateral ligaments, cruciate ligaments, patellar ligaments, fat pad, meniscus and synovial sac;
3. Should have discrete muscle and skin layers provides realistic tissue and needle response;
4. Should have synovial sac with fluid bag incorporated a one-way valve for recharging with aspirant;
5. Skin surface should be washable using soap and water and can be changed conveniently;
6. Should be provided with the base made of high quality material to stabilize the model
7. Should be supplied complete with Liquid Bag, Syringe

(10) SPECIFICATIONS OF ELBOW FOR JOINT INJECTION

1. Should have a standard patient posture for injection:
2. The elbow joint should be flexible and rotatable
3. Should have a lifelike anatomical landmarks including medial epicondyle, epicondylus, ulnar nerve, ulna, radius, cavity of elbow joint, ect;
4. There should be a Yellow LED when the correct pressure pain points are found, green when needle is correctly placed in each of the injection sites and red if needle enters ulnar nerve lying behind medial epicondyle;
5. Should have puncture sites located in medial epicondyle, and epicondylus;
6. Skin surface should be washable using soap and this simulator should be provided with the base made of high quality material to stabilize the model.
7. Should be supplied complete with Elbow for Joint Injection , Controller , Syringe , Liquid bag

(11) SPECIFICATIONS OF SHOULDER FOR JOINT INJECTION

1. Should represent normal anatomy precisely (both superficially and subdermally) for palpation purposes;
2. Should demonstrate the standard patient posture for injection;
3. Should have different Injection specific sites: Glenoid fossa anterior; Glenoid fossa posterior; Subacromial space; Acromioclavicular joint; Bicipital groove; Suprascapular nerve block.
4. Green LED should turn on when needle is correctly inserted in each of the injection sites;
5. Easy to clean up with soap resolution.
6. Should be supplied complete with Shoulder for Joint Injection , Controller , Syringe , Liquid bag

(12) SPECIFICATION OF TRANSPARENT MALE CATHETERIZATION

1. Model should enable trainees to observe pelvis and bladder through the transparent cover
2. Trainees should experience actual resistance and pressure as with a real patient during catheter insertion.
3. Designed for demonstrate and practice of catheterization, indwelling catheter and bladder irrigation.
4. The model should be a simulation of the lower torso of an adult body with standard catheterization position;
5. Should consist of anatomical structures include pelvis, ureter, urethra, bladder and pudendum;
6. Should allow the users to demonstrate and practice of catheterization, indwelling catheter and bladder irrigation;
7. The penis of the model can be adjusted to make an angle of 60° with abdomen during the tube insertion.
8. Artificial urine (water) should flow from the catheter when bladder is successfully inserted
9. Should be supplied complete with Transparent Male Catheterization Model, Catheter, Liquid Bag

(13) SPECIFICATIONS OF FEMALE CATHETERIZATION SIMULATOR

1. Vivid reproduction of female lower torso brings lifelike experience of resistance and pressure as you will have with a real patient.
2. Should be Designed for demonstration and practice of catheterization, indwelling catheter and bladder irrigation, this simulator is extremely durable.
3. Should have One-way valve technology and should not leak after catheter pull; The simulator should provide an external reservoir simulation urine bags;The model can be continuously taught and shown back in the teaching process; Clinical criteria can be used to conduct catheters.
4. Should be made of special material, durable and lifelike.
5. Should come with urethra and pudendum
6. Should Simulate an adult female lower body, standard catheterization position: supine knees legs outreach; External genitalia and perineum should imitate the structure of the true size and shape of women soft, small labia apart to expose the clitoris, urethra; Demonstration and practice of catheterization, indwelling catheter and bladder irrigation
7. Should allow the users to demonstrate and practice of catheterization, indwelling catheter and bladder irrigation
8. Artificial urine (water) should flow from the catheter when bladder is successfully inserted
9. Should have a realistic anatomy just as with a real female patient, Nympha should be soft and can be separated to reveal clitoris and urethral orifice
10. The model should experience actual resistance and pressure caused by the mucosal folds, bulbous urethra, and the internal urethral sphincter, just prior to enter into the bladder
11. Should be supplied complete with Female Catheterization Model, Catheter, Liquid Bag

(14) SPECIFICATIONS OF MALE CATHETERIZATION SIMULATOR

1. Should be a Vivid reproduction of male lower torso brings real experience of resistance and pressure as you will have with an actual patient. Designed for demonstration and practice of catheterization, indwelling catheter and bladder irrigation
2. Should be made up of special material, durable and lifelike and should include with urethra and pudendum
3. Should allow the users to demonstrate and practice of catheterization, indwelling catheter and bladder irrigation
4. Artificial urine (water) should flow from the catheter when bladder is successfully inserted
5. The penis of the model can be adjusted to make an angle of 60° with abdomen during the tube insertion.
6. The model should experience actual resistance and pressure caused by the mucosal folds, bulbous urethra, and the internal urethral sphincter, just prior to enter into the bladder.
7. Should be supplied complete with Male Catheterization Model, Catheter, Liquid Bag

(15) SPECIFICATIONS OF INTRAMUSCULAR INJECTION OF UPPER ARM MUSCLES

1. This simulator should be designed for practice of intramuscular and hypodermic injections at two sites on the upper arm. The inner anatomical structure of whole thorax and upper arm should show so one can make an accurate choice of injection sites, and avoid injecting to nerves and veins.
2. Simulator should display an upper body structure of adult, from the neck to the waist; take standard position of the upper arm intramuscular injection;
3. Operation side: significant landmarks including acromion and deltoid should observed; the injection points should be palpated correctly;
4. Observation side: should facilitate to transparent arm, chest and back; the inner anatomical structures of nerve, blood vessels and bone can be observed, including: cervical / thoracic / lumbar vertebrae, brachial plexus, subscapular nerve, axillary nerve, median nerve, ulnar nerve, radial

nerve, superior vena cava, internal jugular vein, subclavian vein, axillary vein, median cubital vein, basilic vein , cephalic vein , aorta, vertebral artery , axillary artery, etc;

5. Model should made up of advanced materials, realistic and beautiful, durable, lifelike skin texture
6. Available operations should facilitate for Intramuscular injection (if the injection is done correctly, the green light shines; if the injection is done at a wrong location or too deep, the red light shines with a buzzer sounds.) and hypodermic injection If the trainee performs an improper injection on nerves, a lamp corresponding to the nerves will turn on.
7. Should be supplied complete with Intramuscular Injection of Upper Arm Muscles, -Syringe

(16) SPECIFICATIONS OF UPPER ARM Section

1. The simulator should be strapped to trainee's arm to practice intramuscular and subcutaneous injections. Flashing green/red light indicates right or wrong injections with following specification
2. The simulator should Simulate a normal arm structure, with a significant landmarks (acromion, deltoid, etc.);
3. The simulator should be used to conduct the deltoid intramuscular, subcutaneous teach and practice;
4. The simulator should be used to conduct the teaching judgement function.
5. Trainees can wear the model to experience the anxiety of real patients; Palpable anatomical landmarks;
6. A green light should indicate correct insertion and injection;
7. A built-in buzzer should sound and a red light will flash in the case of wrong injection;
8. Supplid with Upper Arm Mate model 1, 2ml syringe 1

(17) SPECIFICATIONS OF IV TRAINING ARM

1. The dorsal surface of the incredibly realistic arm should include several injectable veins; venous system should have a simplified setup with only one external fluid bag supplying artificial blood to all veins simultaneously
2. Should have a Realistic "pop" as needle enters vein
3. Should allow the user to practice intramuscular injection, venipuncture and transfusion;
4. Should be supplied with spare arm skin, deltoid pad and veins.
5. Should be supplied complete with IV Training Arm , 2 ml Syringe , Liquid bag

(18) SPECIFICATIONS OF ALL-PURPOSE IV TRAINING ARM

1. Should simulate a standard adult right arm
2. Should be a highly lifelike adult arm with realistic skin
3. Should have accurate anatomical structure: An extensive 8-line vascular system and vascular network of the back of hand
4. Should have a realistic back-flow of artificial blood confirms needle location in the vein
5. Should have a discernable "pop" when entering the veins
6. The needle should be able to be fixed by the transfusion plaster
7. Should have a provision of Intramuscular injection
8. The simulator can be used to conduct intravenous infusion and venipuncture training, puncture correct obvious sense of frustration and a return of blood transfusion needle stick can be used securely fastened; carried deltoid injection training; injection intradermal injection training modules within wearable leather;
9. Should have a provision Intradermal injection in the antebrachium
10. Skin, vessels and injection modules should be replaceable
11. Should be supplied complete with the following:
 - a. All Purpose IV Training Arm
 - b. Intradermal injection pad
 - c. Deltoid muscle pad

- d. Liquid bag
- e. Scalp needle
- f. Syringe

(19) SPECIFICATIONS OF VENIPUNCTURE TRAINING ARM WITH VALVES

1. Should be a reproduction of a normal adult arm with lifelike skin and accurate anatomical structure
2. Should allow subcutaneous injection and correct injection should create realistic skin welt
3. Should allow Venipuncture practice with realistic “pop” and backflow if insertion is correct
4. Should be a mechanical rotatable equipment which should remove damaged valve away and should avoid fluid leakage and should enable long time of use.
5. Should be supplied complete with the following:
 - a. -Venipuncture Training Arm with Rotatable Valves
 - b. -Liquid bag
 - c. -Scalp needle
 - d. -Syringe

(20) SPECIFICATIONS OF IV INJECTION TRAINING HAND

1. Should be a Lifelike reproduction of human hand with soft and pliable skin and flexible fingers
2. Should have Artificial blood vessels which should represent the complete vein network of the dorsal hand which can be easily identified
3. There should be several veins of different sizes for realistic injection management
4. Should allow practice of venipuncture and IV infusion on the superficial veins
5. Should have a realistic pop and backflow should confirm correct needle location
6. Should be mounted on a base makes the simulator perfect for both demonstration and practice
7. Skin, veins should be replaceable
8. Should be supplied complete with the following:
 - a. -IV Injection Training Hand
 - b. -Spare skin
 - c. -Spare vessel
 - d. -Liquid bag
 - e. -Scalp needle

(21) SPECIFICATION FOR VENIPUNCTURE PAD

1. Trainees should wear the pad to practice venipuncture skills.
2. Should have lifelike tactile sensation of skin, this simulator delivers the most true to life veins for venipuncture practice;
3. Should have practice venipuncture and injection on the forearm.
4. Blood vessel under the skin should be palpated and blood vessel and skin can be easily replaceable.
5. Realistic “pop” and backflow should confirms correct needle location
6. Should have light weight, portable and easy to attach to trainee’s arm;
7. Supplied complete with Venipuncture Pad, Spare skin, Spare vessel, 2ml syringe, Liquid bag 1

(22) SPECIFICATIONS OF ARTERY PUNCTURING TRAINING ARM

1. Should be a Lifelike reproduction of an adult right arm which should allow for palpation of arterial pulse and practice of arterial puncture
2. Should have anatomical landmarks include radial artery, ulnar artery and styloid process of radius;
3. Should Simulate radial arterial puncture and should allow drawing arterial blood samples;
4. Arterial Puncture Arm should be easy to maintain with spare skin and arteries.
5. Should be supplied complete with the following:
 - a. -Artery Puncturing Training Arm
 - b. -Spare skin
 - c. -Spare vessel
 - d. -Liquid bag
 - e. -Pump bulb
 - f. -Syringe

(23) SPECIFICATIONS OF MULTI-PURPOSE INJECTION TRAINER

1. Should have Anatomical layers: skin, subcutaneous tissue and muscular
2. Should consist of Real liquid which can be injected into the subcutaneous tissue and can also be squeezed out
3. The liquid injected into the pad can be squeezed out
4. Should have a steady base plate
5. Should have a replaceable tissue layers
6. Should be supplied complete with Multi-purpose Injection Trainer, Syringe

(24) SPECIFICATIONS OF ARTERY PUNCTURING TRAINING ARM WITH ROTATABLE VALVES

1. Should have precise anatomical structures
2. Should have apparent pulse for arterial puncture;
3. Should have realistic artery blood pressure that can push the syringe upwards
4. Should be equipped with a bracket to keep the arm in a suitable position
5. Should have rotatable valves to avoid leakage of artificial blood after several times of puncture
6. Vessels and skin pads should be replaceable
7. Should be supplied complete with Main model , -Liquid Bag, Pump Bulb, -Syringe, Spare wrist skin pads

(25) SPECIFICATIONS OF INTRAMUSCULAR INJECTION MODEL (BUTTOCK)

1. This high-tech medical model with realistic skin should teach proper injection techniques and how to avoid nerves and veins.
2. It should be a see-through right side which should show internal structure including bones, muscles, nerves and veins; The anatomical structures include: the pelvis, lumbar vertebrae, sacrum, coccyx, pubic symphysis, hip muscles, femoral nerve, sciatic nerve, superior gluteal nerve, artery and vein;
3. A green light should indicate correct injection technique and position while a buzzer sound should and flashing red light should warn the users if the insertion is too deep or needle position is incorrect
4. Injections should leave no marks.
5. It should allow the user to infuse real fluid as well as drain out conveniently.
6. The skin should be made from a composite material with high elasticity, which should be durable for multi-injection
7. Should be supplied complete with the following:
8. Buttock Intramuscular Injection Model- 1no.

(26) SPECIFICATION FOR INTRAMUSCULAR INJECTION SIMULATOR (WITH ANATOMICAL STRUCTURES)

1. It has realistic reproduction of an adult lower body structure ranging from waist to knee;
2. Left side of the model should shows internal structure and the other side is used for injection;
3. Left side: should shows the anatomical structure of hip muscles and nerves including gluteus maximus, gluteus medius, gluteus minimus and sciatic nerve, peripheral vascular and the interrelated anatomy.
4. Anatomical landmarks enables to correct localization (iliac crest, gluteal cleft vertex and other landmarks),
5. Should enables gluteus maximus, gluteus medius, gluteus minimus and vastuslateralis intramuscular injection training
6. Should adopts composite material of high elasticity (durable) as the skin of module to provide realistic feeling while conducting injection;
7. Should be supplied complete with Intramuscular injection simulator, Syringe

(27) SPECIFICATIONS OF IV TRAINING LEG

1. Should be a lifelike reproduction of an Asian adult left leg
2. Should consist of a lifelike adult leg with realistic skin made of soft and stretchy material
3. Should allow the user to practice venipuncture, sampling and transfusion on the leg.
4. Should show Realistic "pop" as needle enters vein;
5. Should have an External fluid bag which supplies artificial blood to the veins simultaneously
6. Should have accurate anatomical structures includes great saphenous vein, small saphenous vein, lateral superficial femoral veins, venous rete of foot, all of which can be punctured;
7. Should come with spare leg skin and veins.
8. Should be supplied complete with IV Training Leg , Scalp needle , Syringe, Liquid Bag

(28) SPECIFICATIONS OF INJECTION SIMULATOR

1. Should have correct anatomical landmarks
2. Green Light should light up if injection is correct
3. A built-in buzzer and flashing red light should indicate injection at a wrong site;
4. The simulator should be made of hi-tech silicone material that no puncture traces are left after use
5. It should allow the user to inject and drain real fluid easily
6. Should be supplied complete with Mate Injection Simulator , Syringe 2ml – 3 nos

(29) SPECIFICATIONS OF INTRADERMAL INJECTION SIMULATOR

1. Should be a life lilke reproduction of patient forearm
2. Should have atleast 15 sites for intradermal injection;
3. Correct injection should produce a characteristic skin welt.
4. Should be supplied complete with Intradermal Injection Simulator , Syringe, Carrying case

(30) SPECIFICATIONS FOR SUCTION TRAINING MODEL

1. Practice of suctioning via nasal/oral passage and tracheal cannula access. Demonstration of correct suction procedure. By opening left side of face, internal structure can be revealed and position of inserted tube can be confirmed.
2. Should have anatomical structure including nasal cavity, oral cavity, superior, middle, inferior nasal concha, pharynx, tongue, denture, esophagus, trachea, etc
3. Should allow suction through tracheostomy site.
4. The suction tube should be such that it can be inserted into nasal cavity, oral cavity and tracheostomy site;
5. Should allow the users to practice suction with artificial sputum.

6. Should be supplied complete with Suction Training Model , Suction Tube

(31) SPECIFICATION FOR BEDSORE CLEANSING AND DRESSING

1. Should display all four stages of decubitus ulcers on the simulation buttock.
2. Should be soft, wound color fidelity, true in the model shows four stages of pressure ulcers.
3. Trainer should form a correct understanding of pressure sores on the model to enhance the patient's sense of responsibility to prevent the occurrence of pressure sores.
4. Should be made up of special materials with perfect tactile sensation and appearances
5. Should demonstrate all four stages of decubitus ulcers; Bleeding rosy period, inflammatory infiltration period; Superficial ulcers period; Necrotic ulcers period;
6. Should designed for practice of decubitus ulcers assessment, and measurement of wound length, depth, undermining, and tunneling.

(32) SPECIFICATIONS OF ENEMA ADMINISTRATION SIMULATOR

1. Should have accurate anatomical structure including anus, recta and anal columns Should allow the users to practice enema procedures including: large/small volume enema, retention/non-retention enema
2. Should allow the user to apply one way valve to prevent fluid leakage from anus and the liquid can be drawn out easily after use.
3. Should be supplied complete with -Buttock Pad, -Anal Tube , -Liquid Bag

(33) SPECIFICATIONS OF CENTRAL VENOUS CATHETERIZATION SIMULATOR

1. Should have lifelike anatomical structures include: clavicle, ribs, internal carotid vein, subclavian vein, innominate vein, heart, brachiocephalic trunk, common carotid artery, subclavian artery, with relative positions;
2. Should have replaceable skin pads for practice of central venous catheterization, including: percutaneous subclavian and internal carotid catheterization;
3. Peripheral veins of basilica, cephalic and median cubital veins should, allow for a full procedure from trochar insertion to catheter insertion along guide wire
4. Should have a realistic sensation of needle insertion and catheterization;
5. Should have lifelike drawback of fluid;
6. Can view the catheter position through different window (insert to the superior vena cava successfully, fail to inserting to the internal jugular vein, fail to inserting to the contralateral brachiocephalic vein) CVP training Spare precordial skin for examination Liquid can be drained to the external Changeable blood vessels and skin(including arm skin, blood vessels, subclavian skin,internal jugular vein and skin of the anterior region of neck)
7. There should be several places to check if the position of catheter is correct
8. Should be supplied complete with Central Venous Catheterization Simulator , Spare Vessels
9. , Drainage Bag, Liquid Bag

(34) SPECIFICATION FOR ABDOMINOCENTESIS TRAINING SIMULATOR

1. Should Simulate the abdominal appearance of the real person from the head to the symphysis
2. Should have pubic standard skin landmarks which includes : collarbone, stemalangle, rib, intercostal space, left and right costal arches, epigastric angle, xiphoid, anterior superior iliac spine, Umbilical, symphysis public, groin and other analogical structures and precise positions; Percussion training of the abdominal shifting dullness should be performed
3. Limited pyoperitoneum puncture training should be practiced
4. Should have different color of different puncture parts
5. Paracentesis of bladder should practice, if correct, the yellow liquid can be drawn out;

6. Equipped with obvious large spleen, when puncture touch the spleen, alert will sound immediately;
7. Alert sound should immediately blow if by mistaken puncturing into the right artery under the right of the abdominal wall

(35) SPECIFICATION FOR ADVANCE ENDOTRACHEAL TRAINER

1. Model should have open-able chest cover to reveal the internal anatomy of the stomach while the lung is transparent, so that more convenient methods inspection operations should be demonstrated; the model should use for assessment of the student's correctness on training;
2. Should have realistic anatomical structure, including: nose, mouth, teeth, tongue, uvula, epiglottis, vocal cords, trachea, bronchus, lung, esophagus, stomach, diaphragm, liver, intestines;
3. The model should use to simulate carotid pulse.
4. Endotracheal intubation should inject into the analog sputum endotracheal intubation, suctioning after the oral, nasal suctioning and attract intraoral technique training operations.
5. The model should carry out by mouth suction method, nasal suctioning and attract intraoral technique training operations.
6. Lavage operation should carry out with a funnel gastric lavage or gastric lavage;
7. The chest cover should open-able in the process of operation in order to observe whether the tube is put right.
8. In the intubation process, trainee should clearly see the epiglottis and uvula;
9. The simulator should connect manually inflatable ball recovery operations;
10. Carotid pulse should simulate in the base of the throat can be clearly touched.
11. Weight should be less than 8 kg
12. Supplied complete with components : Manikin, Simulating sputum, Suction vessel, Gas Ball, Water bag and water stop

(36) SPECIFICATIONS FOR SUCTION TUBE FEEDING SIMULATOR

1. Simulator should consist of two parts: patient head and bed;
2. Should have standard anatomic structure for demonstration and learning of causes for miss-swallowing;
3. Simulator should study proper eating position and the relation between patient head and bed angle.
4. Simulator should have study neck angle (head angle) and its relation with missswallowing;
5. Training should learn how to insert tube via nasal passage, and intermittent tube eating method.
6. Should have precise anatomical structure, including: nasal, upper, middle and lower turbinate, mouth, tongue, teeth, epiglottis, larynx, etc.
7. Should have under exercise NG tube and tube feeding , aspiration emergency etc

(37) SPECIFICATIONS OF PNEUMOTHORAX SIMULATOR

1. Should have anatomical landmarks including clavicle, rib, sternum and mammilla;
2. Should allow to operate the centesis in the second intercostal space in the midclavicular line, or thefour and fifth intercostals space in the lineapreaxillaris;
3. Should have a push pedal to charge the air chamber
4. Should have discernable "pop" when entering the thorax cavity
5. Should have a replaceable Air chamber
6. Should be supplied complete withPneumothorax Simulator, Suction tube, Artificial air bag

(38) SPECIFICATIONS OF CHEST TUBE MANIKIN

1. The manikin should have a standard posture with lifelike anatomical landmarks including sternum, clavicle, ribs, and pleura
2. The right side of the manikin should have two cut-away viewing areas to provide awareness of the anatomical relationships between skin surface, musculature, ribs, veins, nerves and lungs
3. Should have at least two puncture sites including Pneumothoraxcentesis in the second intercostal space in the midclavicular line; and Thoracic closed drainage in the sixth intercostal space between the lineapostaxillaris and midaxillary.
4. Should be able to simulate pneumothorax using pump bulbs and liquid for thoracic closed drainage;
5. The skin pad should be replaceable.
6. Should be supplied complete with , Chest Tube Manikin, Spare skin pads, Liquid bag, Pump bulb

(39) SPECIFICATIONFOR INTRAOSSEOUS INFUSION / FEMORAL ACCESS LEG

1. Should have realistic reproduction of a child left leg with flexible knee joint
2. Should precise anatomy with knee joint, tibia, femoral artery and veins
3. Should have Palpable anatomical landmarks is easy to locate the site for tibial puncture;
4. Should have Discernable“pop” and artificial marrow will flow out;
5. Should Practice femoral venous puncture with palpable artery pulse;
6. Should have Discernable “pop” and artificial blood feedback when operation is correct;
7. Flexible knee joint should assume different postures;
8. Should have four sides of the bone can be punctured, and the bone holes can be sealed later;
9. Easy to operate.
10. Supplied with : Intraosseous Infusion/Femoral Access Leg 1, Spare bones 4, 50ml syringe 1, Pump bulb 1, Liquid bag 1, Sealant 1

(40) SPECIFICATION FOR ASEPTIC OPERATION TRAINING MODEL

1. Should enable disinfection skill training
2. Should consist of abdominal wall anatomy skin, subcutaneous tissue, abdominal muscle and peritoneal membrane
3. The simulator should imitate the torso of an adult male from head to symphysis pubis with obvious anatomical and marks including Muscle, sternal angle, clavicle, rib cage and other anatomical structure
4. Should be made up of high quality elastic material fine skin texture, shape lifelike feel real, durable and can be sterilized surgical training according to the requirements of different surgical sterilization torso area
5. After daubing the simulating iodine tincture, the same effect should appear on the simulator just like on the real person,
6. Supplied complete withAseptic operation training model, Simulate liquid of iodine tincture, Clothes

(41) SPECIFICATIONS OF BABY TRANSPARENT LAVAGE MODEL

1. The model should have a transparent front cover to allow the user to directly observe the internal organization of the anatomical structure and tube location
2. Should include various anatomical structures like lungs, esophagus, stomach, liver, diaphragm, spleen and intestine
3. The model should have a medical connector that can be connected with conventional medical connector
4. The model should provide gastric lavage training, training in gastrointestinal decompression, gastric juice, nasal feeding, collection of orotracheal intubation training.
5. Should be supplied with the following:

- a) Baby Transparent Lavage Model 1
- b) Gastric tube 1
- c) Syringe 1
- d) Pad 1
- e) Lubricant 1

(42) SPECIFICATIONS OF PROSTATE EXAMINATION SIMULATOR

1. Should be realistic reproduction of an adult lower part with standard posture for prostate examination
2. Should clearly show anatomy of rectum, genitalia, normal and abnormal prostate;
3. Atleast Eight separate prostate glands should be supplied with the torso: Normal prostate gland with distinct intermediate sulcus;
4. Prostatic hyperplasia should be smooth and tenacious prostate gland enlarges highly and intermediate sulcus disappears;
5. Should have Acute prostatitis; Acute prostatitis with abscess, showing hard and highly enlarged prostate gland;
6. Benign, slightly enlarged; A discrete, hard nodule is palpable in the upper right quadrant, simulating the early stage of prostate tumors; the spread of carcinoma should be demonstrated in this gland, and the small nodule should change into a mass; Gland totally replaced with carcinoma.
7. Should be able to perform prostate massage.
8. Should be supplied complete with: Prostate Examination Simulator , Interchangeable prostate glands, Latex Gloves

(43) SPECIFICATION FOR MULTI-PURPOSE CLINICAL CENTASIS

1. It should simulate the upper torso of an adult male
2. Should have electronic pulse in both femoral and jugular artery
3. Should have head upward and left lateral for puncture on the right lateral part of the neck;
4. Should have correct anatomy including sternocleidomastoid muscles, terna angle, xiphoid process, collarbone, ribs, anterior superior iliac spine, posterior superior iliac spine, and spinous process, etc;
5. Should allow the user to practice percussion: pneumothorax, liver border, and shifting dullness;
6. Should Include at least 15 puncture sites: like right internal jugular vein puncture, right femoral vein puncture, left pnemothrax puncture, left posterior axillary line thoracic puncture, liver abscess puncture, abdominocentesis, sternum bone marrow puncture, right renal puncture ,intracardiac injection etc.
7. There should be a man outline in the control panel to guide the user to the puncture site; In exercise mode, there should be vocal instruction before operation while in test mode there should not be any vocal instruction;
8. Correct injection should draw artificial liquid to flow whereas incorrect injection should cause a vocal alarm.
9. Should be supplied complete with the following:
 - a. Multi-purpose Clinical Puncture Simulator
 - b. Syringes
 - c. Controller

(44) SPECIFICATIONS OF DIABETIC FOOT TRAINER

1. The simulator should demonstrate the symptom such as fester of the diabetic foot infection serve as the ideal model for basic nursing
2. The simulator should demonstrate the symptom such as fester of the diabetic foot infection caused by diabetes, therefore it serves as the ideal model for demonstration of the basic nursing care of diabetic foot

3. The simulator should help to demonstrate the symptoms of the 5 stage of the diabetic foot, including shallow ulcer, deep infection edema necrosis, decay
4. The 1st 2nd 3rd toe of the simulator should demonstrate the serious invasive and traumatic foot lesion coupled with the nerve lesion
5. The 4th 5th toe of the simulator should be thanatosis
6. The appearance of the simulator should be realistic and durable, the toes are bendable
7. Should be supplied with the Diabetic foot trainer model

(45) SPECIFICATION FOR ADVANCED GYNECOLOGIC SIMULATOR

1. Should consist of a full size adult female lower torso with standard lithotomy.
2. Should have relevant internal anatomy including uterus, ovary, fallopian tubes and round ligament
3. Should have visual recognition of normal and abnormal cervixes, as well as normal and pregnant uteri
4. Should have External pelvic measurement facility : Bimanual examination, rectal vaginal examination (including insertion of speculum and colposcopy) Analysis of cervical lesion, placement and removal of IUD, practice use of laparoscope
5. Should Come with anteverted uterus, retroverted uterus 7 to 9 weeks uterus, 10 to 12 weeks uterus and 20 weeks uterus
6. Should consist of Normal cervix, pregnant cervix linear laceration which should indicate parous, carcinoma cervix with inclusion (nabothian) cyst and endocervical polyp
7. Should be supplied with - Advanced gynecologic simulator , -Uteri , -Cervix , - Disposable speculum

(46) SPECIFICATIONS OF FUNDUS SKILLS & ASSESSMENT SIMULATOR

1. Should have Upper thighs that articulate for positioning;
2. Should have realistic landmark of the symphysis pubis;
3. Should have interchangeable uteri: Firm, well-contracted uterus; "Boggy" uterus;
4. Should have Vaginal orifice which should be visible and opened;
5. Labium minus should be flapped to expose the vaginal canal.
6. Should be supplied with Fundus Skills & Assessment Simulator

(47) SPECIFICATION FOR INTRA AURAL EXAMINATION TRAINER

1. The neck should be tilted to allow proper head positioning
2. Anatomically correct soft ear model should allow training in straightening the auditory canal by pulling the auricle
3. Should be checked by using the otoscope
4. Should diagnose up to at least 25 cases

(48) SPECIFICATION FOR TUBE FEEDING SIMULATOR

1. Should have realistic reproduction of the body structure of an adult male ,with realistic anatomical structure includes glottis, larynx, nasal cavity, oral cavity, dental prosthesis, tongue, uvula, epiglottis, trachea, esophagus, clavicle, rib, xiphoid, stomach
2. Should have pupil examination
3. Should have facility for oxygen inhalation through mouth and nasal cavity, simulate the suction training
4. Should have facility for oral care and dental prosthesis care
5. Should have facility for practice of NG and oral tube insertion, practice of lavage can be done; Tube feeding nutrition liquid insertion practice; water can be infused into and drawn out from the stomach simulating gastric juice infusion and exaction.
6. Should have practice of Endotracheal intubation through oral cavity;
7. Artificial carotid pulse can be done

8. Facility for various positions including, semi recumbent position, horizontal position, The head can rotate about 45° to one side.
9. Supplied complete with one each of following
 - a) NG Tube & Oral Care Simulator
 - b) Clothes
 - c) Liquid bag
 - d) Disposable infusion set
 - e) Gastric tube
 - f) Lubricant
 - g) Ball pump
 - h) BP arm
 - i) IV arm

(49) SPECIFICATION FOR PERITONEAL DIALYSIS SIMULATOR

1. Should simulate the lower body of adult in a standing position
2. Should have obvious anatomical landmarks include Umbilical, symphysis pubic; With the standard ostomy position
3. Should be demonstrated of the peritoneal dialysis ; besides that should be used to practice the indirect peritoneal dialysis exercise;
4. Should be used with real fluid during operation;
5. The closed type liquid storage tank should assure no leakage phenomenon and should be easy to clean and ensure the stability of fixed base
6. Should have light weight not more than 6kg

(50) SPECIFICATIONS OF BREAST GLAND EXAMINATION TRAINING SIMULATOR

1. This anatomically accurate simulator should be composed of a hard inner body covered by a soft vinyl skin. All basic and sophisticated examination methods should be demonstrated.
2. The model should simulate adult female body with real-life skin, and realistic feeling;
3. Should enable the uses to practice Palpation on the breast
4. The palpation practice of supraclavicular lymph nodes and armpit lymph nodes
5. In the upper outer quadrant and the lower outer quadrant of the right breast of the simulator should lie two benign tumors respectively.
6. The simulator should simulate the pathology of the nipple bleeding;
7. Malignant tumors lie in the left armpit; Besides that there is another mode of the left supraclavicular lymph node enlargement adhesion, crater nipple, peel like changes of the skins;
8. Simulator should be portable, compact
Should be supplied with the following
 - a. -Breast Gland Examination Training Simulator
 - b. -Simulator blood powder
 - c. -Injector

(51) SPECIFICATIONS FOR SIMULATOR FOR MALE NEONATAL CARE

1. The simulator should simulate 6 neonate conditions (normal, hungry, over fed, wet, fevering and scared) of a 3 to 6 months baby with articulating legs and arms
2. Should be useful for nurses, pediatric doctors and new parents to practice and learn all techniques and skills of baby care;
3. Should include Rectal thermometry i.e real-time vocal prompt of pulse rate and temperature;
4. The baby should be able to change from one mode to another and should allow for Manipulation of rectal thermometry, feeding, cherishing, replacing diaper and bathing etc
5. The baby should change to hungry or wet mode automatically, and should change to over fed mode after feed as time goes on.

6. Should have rectal Temperature measurement function
7. Should be supplied with the following :
 - a. -Intelligent Baby (Boy) 1
 - b. -Feeding bottle 1
 - c. -Thermometer 1
 - d. -Diaper 1

(52) SPECIFICATIONS OF INFANT IV ARM

1. The manikin should be a Lifelike reproduction of an infant arm with vivid skin texture
2. Should allow Venipuncture in antecubital fossa and dorsum of the hand
3. Should allow to carry out venipuncture and transfusion;
4. Should allow the Fluid to be infused for realistic flashback;
5. Should consist of replaceable skin and vessel.
6. Should be supplied with : Infant IV Arm 1, Spare skin 1, Spare vessel 1, Scalp needle 1 Syringe 1, Liquid Bag 1

(53) SPECIFICATION FOR PAEDIATRIC LUMBAR PUNCTURE SIMULATOR

1. The model should be a reproduction of a real neonatal infant positioned for practice of Lumbar puncture techniques
2. Should allow the user to practice neonate lumbar puncture
3. Should enable the user to draw artificial brain-ridge liquid
4. Should have Lateral decubitus position;
5. The model should have a realistic spine with spinal cord which can be palpated for correct puncture location
6. The manikin should allow the infusion of the fluid
7. Should be supplied with Baby Stap 1, syringe 1, Liquid bag 1

(54) SPECIFICATIONS OF SURGICAL BANDAGING SIMULATOR

1. Should present a female trunk from upper leg to neck;
2. Should be a anatomical realistic model for easy demonstration including clavical, breast, sternum, rib, anterior superior iliac spine, navel, scapula, vertebral column and anal cleft;
3. Should have various surgical wounds, including: Thyroidectomy, Mid Sternal split with chest tube drainage, Mastectomy-with simulated drainage, Mammary abscess incision, Pneumothorax- with chest tube drainage, Thoracotomy- chest tube drainage, Cholecystectomy- with simulated T- tube, Laparotomy, Appendectomy, Abdominal hysterectomy, Colostomy, Leostomy, Cystostomy, incision of femoral artery puncture, Nephrectomy, Laminectomy, Sacral decubitus ulcer – stage 2, leg amputation etc.
4. The model should be made of advanced material and should be is portable and easy to store
5. Should be supplied complete with Surgical Bandaging Simulator

(55) SPECIFICATION FOR SUTURE PRACTICE TRAINERS (COMPLETE)

Should consist of complete set Suture Practice Arm, Leg and Suture tutor

1. SPECIFICATIONS OF SUTURE PRACTICE ARM:

- I. Should provide a lifelike suturing experience for students or a realistic suturing demonstration by an instructor.
- II. Should have realistic skin texture with wrinkles, pores, and visible fingerprints
- III. Should have soft and pliable for easy sewing, the skin should be tough enough that sutures will not pull out when tightened;
- IV. Should have "wounds" can be cut, to practice incision, suture, knotting, cutting off, stitches removal, and bandaging; Reveal lifelike red muscle after incision;
- V.

- VI. Should have the possibility to make More than 100 cuts on the model and each of these cuts can be sutured several times.
 - a. Should be supplied with the following
 - b. -Suture Practice Arm- 1 No
 - c. -Instrument kit- 1 No

2. SPECIFICATIONS OF SUTURE PRACTICE LEG

- I. Should have a realistic skin texture with wrinkles and pores;
- II. The structure layers should be clear to view skin, subcutaneous and muscle tissues;
- III. "Wounds" can be cut to practice incision, suture, knotting, cutting off, stitches removal, and bandaging;
- IV. Should be soft and pliable for easy sewing, the skin should be tough enough that sutures will not pull out when tightened;
- V. More than 100 cuts can be made on the model and each of these cuts should be sutured several times;
- VI. Should be supplied complete with the following:
 - a. -Suturing Practice Leg- 1 No
 - b. -Instrument kit- 1No

3. SPECIFICATIONS OF SUTURE INCISSION AND SKILL TRAINER

- I. Suture Tutor should serve as a resource to help convey the essential skills required for making skin incisions and suturing in a variety of methods.
- II. Practice skills including: instrument management, planning and performing a linear incision, interrupted suturing, continuous suturing, knot tying, etc;
- III. High-quality material makes practice more realistic and impressive;
- IV. An instruction CD is available as an assistant;
- V. Mounted on a steady base; Skin pad is replaceable.
- VI. Should be supplied with the following
 - a. -Suture Tutor
 - b. -Instrument kit
 - c. -Suturing pad

(56) SPECIFICATION FOR KNOT TYING TRAINER

1. Simulator should includes simulated abdominal cavity, blood vessels and vascular structure
2. Should have flexible and elastic abdominal wall for tying in a small opening
3. Should be easily - removal abdominal wall enable easy replacement of the vessels
4. Should have simulated blood vessels, flexible and realistic, are divided into two different diameters, and are attached to the simulated vascular bed.
5. Should have facility to able artificial blood infusion.
6. Lifelike model should allow training and practicing of comprehensive knotting techniques and vascular ligation as well s large-scale training of the students;
7. Simulator should be portable, lightweight and easy to carry;
8. Should have replaceable Vessels and vascular bed.

(57) SPECIFICATION FOR SIMULATOR FOR LOCAL ANAESTHESIA TRAINER FOR MINOR SURGERY

1. Should be able to perform local anesthesia for minor surgery using ring blocks and various infiltration techniques
2. Should have topics to cover syringes&needles, drugs & dosage, infiltration anesthesia, and ring block
3. Should have local pervading range of drugs & dosage can be shown clearly
4. Should provide special colored fluid for observing infiltration

5. Should include following training modules:Local Skin Anesthetic, Training Modules.
6. Skin lesions training modules (Including module two sebaceous cysts and lipomas module to simulate different range of minor surgery anesthesia, local anesthesia training various technologies);
7. Finger local anesthesia simulation training modules;
8. Should have changeable pads
9. Should have anesthetic infiltration real simulation of the spread
10. Supplied complete with Lesions modules, 2ml syringe, Carrying case

(58) SPECIFICATION FOR KNOT TYING TRAINER

1. Should have two parts:1 Knot module: practice one-handed reef knot technique, instrument tie, surgeon's knot, slip knot, tying in a small opening; tying at depth vertically in a large opening, and tying at depth, at an angle, in a large opening;2 Vessel ligation module: practice of using vessel clamp, incision, ligation.
2. Unique magnetic system should represent tissue strength;
3. Should have perioperative openings represented by:
 - 1 Small, shallow fixed cylinder for tying in a small opening;
 - 2 Large, deep removable cylinder, reversible for angled abdominal and gynaecological depth tying.
4. Should have transparent cylinders to allow the trainer to observe and assess trainee competence;
5. Should have parallel knotting tubes facility to elastic for a realistic tissue response;
6. Should have Light weight and supplied with Knot Tying Trainer 1

(59) SPECIFICATIONS FOR ELECTRONIC SURGICAL KNOT TYING MODEL

1. It should have a magnetic system which can be used to simulate the organizational strain;
2. Should be provided with two cylinders in different sizes to simulate the knot tying space to provide below mentioned training
3. The small and shallow fixed cylinder can be used to simulate knot tying in the small space;
4. The large and deep removable cylinder can be used to simulate knot tying in a deep angular space which can be seen in the abdominal surgeries and OB/GYN surgeries;
5. The cylinder should be made up of transparent material to make it easier for the observation and assessment on the trainee's performance.
6. Should be supplied with parallel simulated blood vessels which are full of elastic and are realistic
7. The model should be small, exquisite and portable.
8. The electronic detection structure should have capability to record the failures during the operation when the excessive force of knot tying drags the magnetic hook away from the base.
9. Weight of simulator should not be more than 1.5 Kg
10. Should be supplied with Electronic surgical knot tying model 1, Sim vessel 2, Control box 1

(60) SPECIFICATIONS OF GYNECOLOGICAL TRAINING MANIKIN

1. Should be a full-size adult female lower torso with standard lithotomy;
2. Should have relevant internal anatomy includes uterus, ovary, fallopian tubes and round ligament;
3. Should enable the users to make external pelvic measurement; Bimanual examination; Rectal-vaginal examination (including insertion of speculum and colposcopy);
4. Should allow analysis of cervical lesions;
5. Should enable placement and removal of IUD;
6. Should have transparent uteri with uterus round ligament, one anteverted and the other retroverted;
7. Should have normal uterus with moderate retroversion, myomatous uterus, uterus with salpingitis on the right side, uterus with salpingitis on the left side, uterus with marked anteversion-anteflexion, uterus with deformation and salpingitis on the right side and uterus with ovarian cyst on the left side;

8. Should have normal cervix, linear laceration which may also indicate parous, cervical erosion with some mucus, cervical polyp, inflamed Nabothian cyst, acute purulent cervicitis and carcinoma;
9. Uteri and cervixes should be such that it can be assembled conveniently.
10. Should be supplied with the following
 - a. -Gynecological Training Manikin 1
 - b. -Uteri 8
 - c. -Cervixes 7
 - d. -Disposable speculum 1
 - e. -Latex gloves 2
 - f. -Pump bulb 1

(61) SPECIFICATIONS OF TRANSPARENT D&C SIMULATOR

1. Should have transparent cover for demonstration of curettage more convenient;
2. Pudendum should be made of high-tech material with realistic labium majus, labium minus, urethra and vagina;
3. Should be a Lifelike internal anatomical structure: anteverted uterus, allopian tubes, ovary, bladder and ureter;
4. Should have soft and flexible vagina that should enable insertion of speculum;
5. Should permit insertion of curette and cervical canal dilator;
6. The transparent uterus should permit visualization of 6-7 weeks artificial gestational sac;
7. Should allow Female catheterization;
 - a. Should be supplied with the following
 - b. -Decidua Graviditatis
 - c. -Connector
 - d. -Water bag
 - e. -Lubricant
 - f. -Catheter

(62) SPECIFICATIONS OF DILATATION AND CURETTAGE OF UTERUS (NON-TRANSPARENT)

1. Should consist of 3 pads in one set: Anteversion, 6-7 weeks Horizon, 6-7 weeks
2. Retroversion;
3. Should be made up of soft and flexible material;
4. The uterus should be such that it can be opened for placement of artificial gestational sac;
5. This model should permit insertion of curette and cervical canal dilator;
6. Should enable practising of curettage on the simulator;
7. Should be mounted on a base.
 - a. Should be supplied with the following
 - b. -Dilatation and Curettage of Uterine
 - c. -Artificial gestational sac

(63) SPECIFICATIONS OF SIMULATOR FOR IUD INSERTION

A. TYPE 1

1. This anatomically accurate model should represent part of the uterus, ovaries oviduct, cervix and vagina
2. Should enable the users to practice placement and removal of IUD
3. The uterus should be covered by a clear plastic cover to allow easy visualization of insertion & placement of IUD
4. Should allow any type of contraceptive device to be inserted for training and observation
5. Should be supplied with :Compatible Female pelvic organs.

B. TYPE (2)

1. It should be a complete reproduction of female uterus and cervix
2. Should have a clear plastic window that should permit easy viewing of IUD.
3. Should allow the usage of a variety of IUD
4. Should allow contraceptive devices of various sizes to be inserted for training and observation
5. Should be supplied with :Compatible Female pelvic organs.

C TYPE (3)

1. Should have realistic normal uterus, oviduct and cervix
2. Should demonstrate female anatomy of uterus
3. Should allow contraceptive devices of various sizes to be inserted for training and observation
4. Should be supplied with : Compatible Female pelvic organs

(64) SPECIFICATION FOR MATERNITY EXAM MODELS

1. The manikin should simulate a female adult torso structure, supine position;
2. The various structures in the model should include: breast, pubic symphysis, pelvis, fetal, etc.;
3. The model should allow the Trainee to conduct Leopold's maneuvers, pelvic measurements and breast care training; simulate fetus in different trimesters by inflating the internal balloon with the external pump. The fetal position should be such that it can be adjusted to different types to fulfil various palpation training.
4. The simulator should allow fetal heart sound (FHS) auscultation training:
5. FHR(fetal heart rate) range should be 80-200/min.
6. Should provide exercise and assessment modes such that FHR can observed from the screen in exercise mode but cannot be observed from the screen in assessment mode;
7. The FHS should be heard not only from the abdomen with the stethoscope, but also from the amplifier
8. The separate control box should be provided which should be light portable, and easy to assemble.
9. Should be supplied with: Maternity Model –1, Controller –1, Maternity pad – 1m, Pump Bulb - 1

(65) SPECIFICATIONS OF OBSTETRIC MANIKIN

1. Should Demonstrate all the standard delivery processes including normal vaginal delivery, breech delivery, episiotomy, vertex presentation and prolapse of umbilical cord.
2. Should enable the users to practice Leopold's maneuver to determine the fetus' position by palpating its skull and kneecaps;
3. Should have removable abdominal cover for fetus manual positioning;
4. Should have Life-size pelvic cavity with major anatomic landmarks;
5. Should have soft vulval inserts for episiotomy exercises.
6. Should be supplied with : Obstetric Manikin, Fetus, Placenta, Umbilical cord

(66) SPECIFICATIONS OF ADVANCED CHILDBIRTH SIMULATOR

1. Manikin should have features of an anatomically correct pelvic model with fetus and placenta to give students vivid experience with multiple techniques and procedures for childbirth;
2. Should have twinborn (one baby boy and one baby girl) presentation and Delivery
3. Should enable the users to practice multiple delivery skills including palpation of fetus position, head presentation normal vaginal delivery, episiotomy , frank breech presentation, incomplete breech presentation, multiple pregnancy including double head position, head breech position, breech head position, double breech position as well as prolapsed of cord treatment of various placenta previa, fetus aspiration, treatment of the placenta and umbilical cord and neonatal nursing
4. Should allow easy demonstration of Transparent abnormal wall

5. The Vulva, umbilical cord and the abdominal wall should be replaceable
6. Should be supplied with : Advanced Childbirth Simulator, Fetus (boy and girl), Placentas, Umbilical cord

(67) SPECIFICATIONS OF CERVICAL DILATATION/EFFACEMENT SIMULATOR

1. Should allow demonstration of six different stages of prenatal cervix
2. Anatomical structures should include the labia, clitoris, vagina, cervix, the fetal head
3. Should have a realistic reproduction of the vaginal wall texture, tissue density and anatomical structures
4. Should have various stages of Prenatal examination and assessment like- no cervical dilation, no effacement, 2 cm dilatation, 50% effacement; 2 cm dilatation, full effacement; 5 cm dilatation, full effacement;7 cm dilatation, full effacement;9 cm dilatation, full effacement.
5. Should be supplied with : Cervical dilatation / effacement simulator

(68) SPECIFICATION FOR ADVANCED CHILDBIRTH SKILL TRAINING MODEL

1. Model should be versatile; portable, Intrauterine manipulation
2. Should have an anatomically correct pelvic model with fetus and placenta to give students experience with multiple technique and procedure for emergency childbirth.
3. Facility for Postpartum care:
4. Facility for practice and master the comprehensive skills of normal labor, abnormal labor, midwifery and perineum protection.
5. Leopold Maneuver should practice in this model.
6. Adaptive birth canal to be demonstrated dystocia and deal with its relief.
7. Should be supplied with : Advance Childbirth Skill Training Model, -Silicone lubricant or talcum powder, - Obstetric apparatus

(69) SPECIFICATION FOR BASIC NURSING SIMULATOR

1. Should have contemporary aesthetic, Easy to Use, true mobility, wireless and tether less manikin
2. Should have Two Platforms in one (Easy to convert from Female to Male) for teaching and training Nursing students.
3. Manikin must have the following Clinical Skills Features :-
 - a) Anatomically accurate landmarks for realistic clinical skills practice
 - b) Realistic articulation to promote proper patient handling
 - c) Eyes and ears accommodate irrigation procedures or medication administration with
 - d) Real fluids
 - e) Open pliable nares allowing for nasal packing, insertion of nasopharyngeal airways,
 - f) Nasal cannula and NGT placement
 - g) Open mouth allows for realistic oral and denture care, placement, securing and care of
 - h) oral airways, endotracheal tubes and gastric feeding tubes
 - i) Realistic tracheostomy site allows for tracheostomy care and procedural suctioning with real fluids
 - j) Chest tube port for care and maintenance
 - k) Accommodates oxygen delivery methods with realistic chest rise with use of BVM
 - l) Gastric lavage and gavage with real fluids
 - m) manually generated carotid pulse
 - n) Subclavian hole for placement of triple lumen catheter for care (without fluid administration)
 - o) Configurable stomas for ostomy care and irrigation
 - p) Urinary catheterization with real fluid return and vaginal douching can be performed.
 - q) Enema procedures capable with real fluids
 - r) IM injections and medication administration via deltoid, gluteal and vastuslateralis muscles.
 - s) Articulating, easy-to-maintain, IV arm with replaceable IV pucks allowing for IV placement,
 - t) Site care and fluid administration

4. Simulator should be designed in such a way that it can upright at his/her own to perform realistic examination as in case of a real patient.
5. Simulator internal structure should be designed in such a way that all electronics part is separated completely from various fluid reservoirs so that to make more durable and easy for troubleshooting.
6. It should have facility to fill and drain all fluids externally without need of opening any part to refill fluids to make it ready for next training.
7. Simulator must be supplied with:

Wireless Manikin

Conversion Kit from Female to Male

(70) SPECIFICATION FOR TRAUMA TRAINER

1. The trainer should comprise of a hyper-realistic, anatomically similar male head and upper torso.
2. It should be constructed with a skeleton that utilizes user-repairable body skin, neck skins, tracheas, and user-replaceable intraosseous training pucks.
3. Following procedures should be available on the system for handling trauma conditions :-
 - a) Nasopharyngeal Airway (NPA) Adjunct Insertion (with Oropharyngeal visual confirmation of proper measurement and placement)
 - b) Clearing upper airway of obstructions (i.e. finger-sweep) with Oropharyngeal airway measurement and placement.
 - c) Surgical airways (Quick-Trach, Cricothyroidotomy, Cricothyroidcentesis, etc.)
 - d) Chest Needle Thoracentesis
 - e) Sternal Intraosseous Catheter Insertion
 - f) Proximal Humerus Intraosseous Catheter Insertion
4. Should be supplied with all replaceable parts skin, tracheas etc required for complete one year training.
5. Rates of replaceable parts should be quoted separately.

CENTRALISED CLASS MANAGEMENT SYSTEM

1. **Centralized Class Room Management system should be able to connect the following Hi fidelity simulators through their web based briefing and debriefing systems**
 - a. Human Patient simulation including adult and Paediatric mannequin
 - b. Wireless Trauma Care and Anaesthesia Management Simulator (Adult Male)
 - c. Wireless Trauma Care and Anaesthesia Management Simulator (Adult Female)
 - d. Maternal and Fetal Simulator
 - e. Baby Simulator

2. **The system should have following specification**
 - a) The system should be able to create a unified system for the simulation center
 - b) Should be able to connect up to six briefing and debriefing systems.
 - c) Should have provision for scalability upto 100 rooms
 - d) Should have capability to Centralize all videos and data to the web-based software
 - e) Should have facility to Store 12,000 hours of HD video recording
 - f) Should also have Pre-configured briefing and debriefing with software
 - g) Should be supplied with Latest configuration computer
 - h) Should be supplied with one HD LED 52" Display

3. **The system should be supplied with web-based Audiovisual System for briefing and debriefing system:**
 1. Should have all in one, compact, server appliance includes the hardware and software necessary for an integrated digital audio-video recording system.

A total of 4 systems should be provided for
 - a. Wireless Trauma Care and Anaesthesia Management Simulator (Adult Male)
 - b. Wireless Trauma Care and Anaesthesia Management Simulator (Adult Female)
 - c. Maternal and Fetal Simulator
 - d. Baby Simulator
 2. Each Server should have following specification
 3. Should have One server appliance offers a 1:1 ratio between recording areas, simulator and recording appliances with the following built-in components:
 - a) Should be able to simulate record up to 5 video sources per server (4 cameras + 1 monitor)
 - b) Should be supplied with 2 cameras with each system
 - c) Should have Input of 4 PoE IP cameras
 - d) Should have Input of 1 VGA, DVI or HDMI video source
 - e) Should have WiFi connection to simulators
 - f) Should have Input for institution network cable
 - g) Should have Built-in digital audio kit
 - h) Should have Input for a secondary microphone
 - i) Should have Built-in speaker to broadcast in-room intercom announcements
 - j) Should have 1,000 hours of HD video recordings
 - k) Should have Pre-configured with briefing and debriefing software
 - l) Each system should be supplied with a latest configuration PC
 - m) Each system should be supplied with 52" HD LED Display

4. Each server Should have briefing and debriefing Software with following specification :

Should have all in one web -based software application that includes all center management features on one platform without requiring user licenses, site licenses or add-on software modules. Software features should includes:

- a) Recording
- b) Review
- c) Reports
- d) Case Manager
- e) Activities
- f) Calendar
- g) Schedules
- h) Resource Manager
- i) User Manager
- j) System Manager
- k) Light weight directory access protocol LDAP Integration

5. Streaming

- a) Should be able to Live broadcasts with industry leading latency (<1sec)
- b) Should have facility to connect Up to 4 concurrently displays, and synchronized,camera streams, plus 1 simulator in each room
- c) Should be able to show Live stream videos to any number of remote sites
- d) Widescreen HD video broadcast and recording,full screen mode
- e) On-screen PTZ controls: click on image to panand tilt, drag image to zoom in and out; from multior single room views
- f) DVR-type functionality to pause, rewind, and forward; even during live recording

6. Record

- a) Full camera control (pan/tilt/zoom) from both live(single room) and a center overview (all rooms)available in-browser from any client workstation
- b) Pause live or recorded view and continue where you stopped (“time shifted live view”)
- c) Manually start / stop recording or set recording tooccur, based on a schedule or on user actions
- d) Save and restore custom layouts of thesimulation/exam room views including size and positioning of individual video streams per room

7. Review

- a) Immediate access to recorded data in order toreview complex recordings of all camera, simulator, and peripheral device feeds assigned tothe room
- b) Access and control all recorded videos on one page (debriefing, deleting, downloading, renamingor reassigning videos)

8. Assess

- a) Intuitive interface for creating custom checklists / rubrics for Learners, Faculty or SPs
- b) Faculty / Staff can complete user-customizedassessment rubrics, while watching live or recorded video
- c) “What you see is what you get” content editor forthe easiest, most streamlined, checklist-buildingprocess ever
- d) Learners can interact with a variety of the dataentry (i.e. SOAP Note, Step II CS write-up, handoff note, etc.)
- e) Case evaluation, as well as, self and peerevaluations
- f) Control Learner data entry with timer
- g) Faculty / Staff can grade any write up or shortanswer question, submitted by Learners

- h) Standardized Patients can complete checklists, assessing the Learners, as well as each other Search, preview, and have the ability to reuse all questions

9. Report

- a) Generate and export custom reports, covering both the group and individual performance, or use one of the many predefined report options
- b) Give Learners access to their reports at home or on campus
- c) Export data from system to work with outside of system (excellent system for researchers)
- d) Review Faculty and Standardized Patient performance reports for quality assurance and consistency
- e) Follow Learner progress in key skill areas, throughout their career, within your program

10. Activities

- a) All activity cases, event dates, times, and rooms at one glance
- b) Define participant groups (Learners, Faculty, SPs) with a quick link to add new group
- c) Link Activities to Calendar events, for a first glance overview on the daily / weekly / monthly program
- d) Allow Faculty to submit booking requests for specific room / resources within the simulation center, to be managed by center administration
- e) Assign resources, activities and participants to one-time or recurring calendar events

11. Manage

- a) User management tools; with the ability to define roles, access privileges, and group memberships
- b) Batch upload large groups of users at once
- c) Email notifications for Learners and SP's to choose preferred sessions, in times that are indicated / available for assessments
- d) Advanced scheduling capabilities, to automatically adjust station schedules and extend rotations, as SP and learner availability changes
- e) Pre-scheduled recording, start / stop times, and intercom announcements, to coordinate with a pre-defined exam schedule, for a fully automated recording system

Exclusive Capabilities

12. Track

- a) Track the use of simulation center resources (rooms, simulators, personnel, etc.) by client
- b) Generate reports quarterly / by semester / yearly
- c) Generate and export utilization and allocation reports (tools to justify expansion, funding, etc.)

13. Integrate

- a) Connect with any patient simulator to capture 360° live simulation data
Connect any simulated or real patient monitor for capturing and broadcasting HD screen image
- b) Optical character recognition, to turn the video signal from monitor into real-time data streams, for visual trend charts and searchable physiological data
- c) Use predefined layouts or define your own, for identifying key captured values on the connected screen
- d) Remote site configurations

14. Access / Security

- a) LDAP is a standard feature without requiring a module site license

- b) LDAP authentication through your active directory, automated way of importing or updating user accounts from an LDAP directory service LDAP for SSO (Single Sign-On) remove the requirement to maintain multiple passwords for users.
- c) Authenticate users in system against an LDAP directory
- d) Shibboleth for SSO (Single Sign-On): authenticate users against a Shibboleth service, to provide single sign-on capabilities, without the requirement for multiple passwords
- e) View any configured rooms with signed SSL certificates for secured connection