List of equipments for the department of College of Nursing

Sl. No.	Name of Equipments
1	Basic Nursing training Mannequins
2	Obstetric Birthing torse (Whole Body)
3	Paediatric Nursing Care Mannequins
4	Adult Stimulator Mannequins
5	B.P. Apparatus
6	Stethoscope
7	Trays with cover
8	Bowls
9	Bowls with cover
10	Sterilizer/ Boiler / Portable Autoclave
11	Needle Destroyer
12	Laryngoscope
13	Protoscope
14	Glucometer
15	Monometer
16	AED CPR trainer
17	Hi fidelity Adult Patient stimulator
18	Virtual learning software programme for nurses
19	Neonatal resuscitation baby
20	Paediatric intubation trainer
21	Nasogastric & Tracheal care
22	Catheterization & enema trainer
23	Adult multivaneous I V arm trainer

ANNEXURE

SPECIFICATIONS OF MANNEQUINS AND EQUIPMENTS

General specifications desired for all Mannequins:

The color of the mannequin should be in Caucasian simulating Indian babies/adult in medium skin tones.

The material of the mannequin should be of polyvinyl and silicone rubber free from any carcinogenic agents.

The texture of the mannequin should be soft and smooth and close to the feel of baby/adult skin as relevant. The texture must be friction free to demonstrate the desired procedure.

The internal parts of mannequin must be realistically sculpted, anatomically accurate and feel must be smooth/resilient/bony as relevant and suitable for simulation.

The mannequins must be portable and any fittings used in mannequins must be of aluminum or polycarbonate or equivalent

The mannequin's durability must be of minimum 2 years.

The material of the mannequin should withstand extremes of temperature (upto 45 degree Celsius)

The supplier must ensure manufacturer's warranty/guarantee against for the specifications and also manufacturing defects.

The manufacturing units must have an internal system of quality control and supplier should produce the process and certificate from the manufacturers.

The supplier will be responsible for service, maintenance, replacement etc against any complaints up to the satisfactions of the users irrespective of the location of manufacturing unit.

The Lead time must not be more than 6 weeks after confirmation of written supply order.

The supplier must ensure the availability on-call service agent from state headquarters within 48 hours, from local within 24 hours, from outside state within 7 days and incase the problem is not rectified on site at the time of service then its need to be rectified with in next 7 days for minor defects and within 28 days for major defects.

The warranty for mannequins must be two years from the date of receiving at consignees address.

All mannequins should include a soft/Head carrying Case and study questions, Dos and Don't's, instructions manual, maintenance guide, background information, videotape for

demonstrating the use of mannequin, user manual with trouble shooting guidance, technical manual with maintenance and first line technical intervention instructions and any other relevant teaching/training materials in English.

The mannequins should have additional accessories as listed and also talcum powder or silicone gel to avoid friction, list of accessories and spare parts with cost and contact details of its **supplier preferably** within State/Delhi.

The Supplier/manufacture should list the name and address of technical service provider in India.

The payment of the mannequin is linked with installation at consignee address, demonstration to service providers at consignee address and certification of installation and functionality by the head of the concerned department.

The suppliers should agree for 10% of payment to be released after 2 years (Warranty period)

General specifications desired for all equipment's:

The material used for equipment's should be of rust proof, high quality PVC/stainless steel/polyvinyl and silicone rubber as applicable and free from any carcinogenic agents

The stainless steel composition must be of 8 to 10% nickel, 18 to 20% chromium.

The fittings of all equipment's must be of stainless steel/aluminum.

The equipment's should be durable of minimum 3 years for repeated use by trainers/trainees.

The supplier must ensure manufacturer's warranty/guarantee against for the specifications and also manufacturing defects.

Every manufacturing unit must have an internal system of quality control and supplier should produce the process and certificate from the manufacturers

The supplier will be responsible for service, maintenance, replacement etc against any complaints up to the satisfactions of the users irrespective of the location of manufacturing unit.

The lead time of all equipment's should not be more than 6 weeks after confirmation of written supply order

The supplier must ensure the availability of on-call service agent from state headquarters within 48 hours, from local within 24 hours, from outside state within 7 days and incase the problem is not rectified on site at the time of service then its need to be rectified with in next 7 days for minor defects and within 28 days for major defects.

The equipment's should have three years comprehensive warranty and two years of extended comprehensive warranty.

Equipment's should include a Hard Carrying case and study questions, Dos and Dont's, maintenance guide, use of equipment's, background information, transparencies and videotape, User manual with trouble shooting guidance, Technical manual with maintenance and first line technical intervention instructions and any other relevant teaching/training materials, in English.

The equipment's should have detailed information of the device features, functions, detection capabilities, method of operation, materials alarm capabilities, software, specifications and operating ranges, power source, parameter detection ranges etc wherever applicable. This description should contain engineering drawings, pictures and all devices labeling, such as instructions for use and promotional materials.

The equipment's should have additional accessories as listed and also material/gel/oil to avoid friction and enhance smooth function, list of accessories & spare parts with cost & contact details of its supplier preferably within State/Delhi

The payment of the equipment's is linked with installation of consignee address, demonstration to service providers at consignee address and certification of installation and functionality by the head of the concerned department.

The supplier/manufacture should list the name and address of technical service providers in India.

The equipment's should have power cord wherever required, temperature electrode and fittings with at least 10 meters of standard wire and accessories.

The suppliers should agree for receiving 10% of payment of equipment's after 3 years (Warranty period)

All equipment's should have device safety certification.

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BID SPECS FOR ITEM NO 3. AED CPR Trainer

- The manikin shall have a removable full-face mask made of polyvinylchloride (PVC).
- The manikin shall have a soft nose that can be occluded using the nose pinch technique.
- The manikin shall have patent nasal passages.
- The manikin shall have an open oral passage that leads to the lower airway.
- The manikin shall have an articulating jaw to facilitate a modified jaw thrust manoeuvre.
- The manikin shall be able to facilitate a jaw thrust technique to open the airway.
- The manikin shall be able to facilitate a head tilt/chin lift technique to open the airway.
- The manikin shall have a disposable lower airway with tan integral one way valve.
- The manikin shall have a completely removable chest cover.
- The manikin shall have a one-piece rib/stomach plate that can facilitate abdominal thrusts.
- The manikin shall have a removable compression spring.
- The manikin shall have a compression clicker that provides audible feedback.
- The compression clicker can be turned on and off without dismantling the manikin.
- The chest skin will have no visible connectors or other indicators revealing proper pad placement.
- Communication between the manikin and AED Trainer will allow the trainer to respond appropriately based on proper vs. improper pad placement.
- LED's in the chest skin will illuminate to confirm proper AED Trainer pad placement when used with the suitable AED Trainer.
- The AED Training System must contain an AED Trainer, CPR-AED training manikin, and remote control
- The AED Trainer must resemble a realistic automated external defibrillator (AED).
- The AED Trainer must be preprogrammed with 10 scenarios
- The AED Trainer must have clear, audible voice prompts
- The speaker volume must be adjustable with or without the optional remote control
- The unit must be powered by batteries contained in a battery case simulating actual AED battery
- The AED Trainer must contain a status display window that can be manually changed by the instructor
- The AED Trainer must contain an LED display indicating selection of volume level and scenario chosen
- The AED Trainer must simulate the following conditions in preprogrammed scenarios and be able manually override them with the remote control
- Artifact motion
- Poor pad placement
- Correct pad placement
- Shockable rhythm
- Non-shockable rhythm
- Low Battery
- Replace Battery
- Error Condition
- Remote Control must allow user to select preprogrammed and systemized scenarios, adjust the AED Trainer volume, illuminate the LED's in the Manikin chest skin, and manually override or run scenarios activating the conditions.
- When used with standard pads, the AED Trainer must be able to be used with any CPR manikin
- When used with Link Training Pads and the AED Manikin, the AED Trainer must not enter simulated analyze mode until pads are properly placed on the Manikin and the pads connector is properly connected to the AED Trainer.
- IF the Link Training Pads are not properly placed on the AED Manikin chest skin, the AED Trainer will respond with a "Place electrodes on bare chest" voice prompt and not enter simulated analyze mode.

- The system shall consist of a wireless adult manikin, wireless pen touch Instructor tablet PC and an optional patient monitor.
- The system shall be completely wireless and untethered.
- The operating system shall be WINDOWS based.
- A wireless pen touch Instructor tablet PC shall operate the system.
- The wireless pen touch tablet PC shall control the system utilizing 802.11BGN (Wi Fi).
- The wireless pen touch tablet PC shall be capable of operating the system at a distance of up to 300 feet, in ideal conditions.
- The wireless pen touch tablet PC shall convert to a laptop configuration with keyboard by rotating the screen.
- The manikin weight, unpacked and ready for use, shall not exceed 125 pounds, thus permitting easy repositioning by average sized rescuers and learners.
- The manikin shall be self contained with internal electrical and pneumatic power.
- The optional patient monitor shall operate wirelessly.
- The simulator must include two soft sided roller wheel transportation cases
- The compressor shall be built into the manikin body.
- The compressor operational sounds shall not interfere with the auscultation of manikin sounds
- The compressor operation shall not cause unwanted manikin body movement.
- The simulation engine shall reside in the manikin to assure continued correct response to inputs and continued operation in the event of communication loss.
- The system shall provide supplemental wired connectivity and power capability.
- Swappable, rechargeable batteries (while in use) shall be optionally available.
- Battery charging can occur while the manikin is operating (within access to AC power)
- The manikin shall be able to operate for 4 hours continuously in the wireless mode.
- Battery recharge time for the manikin shall be 2 hour for 80% recharge.
- The system shall permit multi-media images to be inserted into simulations.
- The system shall permit lab values to be inserted into simulations.
- The system shall permit X-Rays to be inserted into simulations.
- The system shall permit image display to be inserted into simulations.
- There shall be separate neck skins for cricothyrotomy procedures. Neck skins shall allow multiple cricothyrotomy procedures without the need for replacement after each procedure.
- The simulator shall include 5 Auto Mode Patient Cases which shall cause the simulator to react physiologically correct and incorrect amounts of medication infused. The drug dose need to be manually entered through the user interface..
- Multiple simulations/manikins can be controlled from a single work station.
- The system shall include a profile editor which allows each instructor to specifically configure the simulator and interface to meet their preference and needs.
- The system shall include a display of past, present and future scenario trending providing instructors with situational awareness during a scenario.
- The software must be open infrastructure(architecture) for customized debriefing and Advanced Video System applications.
- The simulator debriefing system shall include webcam, debriefing software and simulator which combines synchronized learner log, patient monitor display, live audio and video feed in a single debriefing file. The debriefing system shall not require additional equipment.
- The single defbriefing file shall be capable of being viewed on any computer equipped with Windows OS and the Debriefer Viewer software
- The single debriefing file shall serve to provide instructor feedback to leaners. This file shall be capable of annotation, by the instructor, during or after the simulation.
- The manikin shall be optionally controlled by multiple operators at the same or different locations, when each is equipped with an additional optional PC which has Manikin controlling software installed.
- The instructor shall have the ability to communicate with the learners wirelessly via built-in microphones and speakers in the manikin's head utilizing wireless technology.

o Airway

- Airway skills/features shall include:
- Controllable open/closed airway, automatically or manually controlled
- Head tilt/Chin lift (sensed and automatically registered in debriefing log)

- Jaw thrust w/articulated jaw (sensed and automatically registered in debriefing log)
- Suctioning (Oral and Nasopharyngeal)
- Bag-mask ventilation (sensed and automatically registered in debriefing log)
- Orotracheal intubation
- Nasotracheal intubation
- Combitube placement
- LMA placement
- Endotracheal tube intubation
- Retrograde intubation
- First grade fiberoptic intubation
- Transtracheal jet ventilation
- Light Wand intubation
- Needle cricothyrotomy
- Surgical cricothyrotomy
- Airway resistance shall be available to turnon/off
- Right main stem intubation shall be possible.
- Stomach distention shall be possible.
- The system shall detect proper head position.
- Cannot intubate/Can ventilate shall be possible.
- Cannot intubate/Can not ventilate shall be possible.
- Tongue edema shall be possible in 2 levels.
- Pharyngeal swelling shall be possible.
- Laryngospasms shall be possible.
- Decreased cervical range of motion shall be possible.
- Trismus shall be possible.

o Breathing

- Simulated spontaneous breathing shall be possible.
- Bilateral and unilateral chest rise and fall shall be possible.
- CO_2 exhalation shall be possible.
- Normal and abnormal breath sounds shall be present
- There shall be 5 anterior ausculatation sites
- There shall be 6 posterior ausculatation sites
- There shall be 9 independently controllable breath sound channels
- Oxygen saturation and Plethysmogram shall be displayed on a optional patient monitor
- A computer screen icon shall display the amount of air being provided during Bag Valve Mask ventilations.
- Bilateral Needle thoracentesis shall be possible
- Unilateral and Bilateral chest movement shall exist
- Unilateral and lobar breath sounds shall be present
- Bilateral chest tube insertion shall be possible

o Cardiac

- An extensive ECG library shall be present with rates ranging from 0 to 220.
- Heart sounds shall occur in four anterior locations to auscultate aortic, pulmonic, mitral and tricuspid sounds
- 4 lead ECG monitoring shall be possible.
- 12 lead dynamic ECG display shall be possible upon a single touch to a monitor icon.
- Defibrillation and cardioversion shall be possible.
- Pacing and capture shall be possible.

o Circulation

- Blood pressure shall be measurable manually by auscultation of Korotkoff's sound (left arm).
- Return to flow blood pressure measurement shall be possible.
- Carotid, femoral, brachial, radial, dorsalis pedis, popliteal and posterior tibialis pulses shall be synchronized with ECG.
- Pulse strength shall be related to blood pressure.
- Palpation shall be detected and logged.

o Vascular Access

- Right arm shall have IV access.
- It shall be possible to establish a IV at anticubital fossa

- It shall be possible to use a tourniquet to get visible vein extension.
- After establishing the iv there shall be blood flash back
- A gravity iv line can be connected to enable to run fluids through the IV
- The iv pad shall be a consumable and easy to replace
- IO access shall be possible via tibia and sternum.
- Be able to pull blood from the tibial and sternal IO needle when through the bone
- A gravity iv line can be connected to enable to run fluids through the IO

○ CPR

- CPR shall be compliant with 2010 Guidelines.
- CPR compressions shall generate palpable pulses.
- Blood pressure waveform artifacts on ECG
- Realistic depth of CPR compressions shall be possible, per AHA 2010 Guidelines.
- Detection of depth, rate, and hands off time of CPR compressions shall be displayed, per AHA 2010 Guidelines.
- Detection of CPR release shall be displayed, per AHA 2010 Guidelines.
- Real time feedback on quality of CPR shall be provided, per AHA 2010 Guidelines.

○ Other

- Eyes shall include blinking include: slow, normal, fast and winks.
- Eyes positions shall be open, closed and partially open.
- Eye movement shall be silent.
- Eye movement shall be electronically controlled causing sensors to enter movement information into an event log.
- Manually change pupils
- The vendor shall offer optional wound modules and moulage kits
- The manikin shall be capable of controlled and measurable urine output.
- The manikin can produce urine. Short term catherization and Foley catherization shall be possible.
- Bowel Sounds shall be available via 4 speakers.
- The manikin shall be able to transmit voice sounds via prerecorded files and/or files
  - created by end user.
- The Instructor shall be able to simulate patient voice and phrases wirelessly via voice
  - over IP (Internet Protocol) technology.
- Simulations shall be controllable remotely throughout a network.
- The system shall be capable of operating in the instructor mode via scenarios or "on the
  - fly".
- The system shall be capable of operating in the auto mode which permits the simulation
  - to proceed without operator interaction, once the scenario has started.

- **Patient Monitor** Configurable Monitor Parameters include (not limited to):
  - ○ ECG (2 traces)
  - ○ SpO2
  - ○ CO2
  - ○ ABP
  - ○ CVP
  - ○ PAP
  - ○ PCWP
  - ○ NIBP
  - ○ TOF

  - ○ Cardiac Output
  - ○ Temperature (core and peripheral
  - ○ AGT
  - ○ awRR
  - ○ N2O
  - ○ ICP
  - ○ O2
  - ○ pH
  - ○ X-Ray Display
  - ○ 12 Lead ECG Display

  - The Simulator manufacturer shall offer optional ACLS Scenarios validated by the American Heart Association.

- The system certifications shall include:
- CE
- FCC

BID SPECS FOR ITEM NO 16. Nursing Training Program

- Should be computerized based training system to challenge nursing students cognition.
- The student scenarios should be based around curriculum.
- It should be able to quiz the student.
- Student should be able to get immediate feedback.
- The program should be able to provide details of patent related cases information.
- The student shall be able to access the EHR.
- It should be able to provide full and updated drug monographs.
- It should be interactive, audio video based and the student shall be able to pick various nursing interventions and procedure to treat the virtual patient.
- It should be able to generate a time stamped personalized feedback with correct and incorrect actions with guided reflections.
- Student access should have the following
  - Suggested Readings
  - Pre-Simulation Quiz
  - Interactive Computer Simulation with personalized feedback log
  - Post-Simulation Quiz
  - Documentation Assignments
  - Guided Reflection Questions
  - Student User Guide & Computer Simulation Tutorial
- Instructors will have access to the following with vSim:
  - Scenario Overviews
  - Professional competency map (QSEN, IPEC, NCLEX)
  - My Classes reporting view
  - Instructor User Guide & Computer Simulation Tutorial

BID SPECS FOR ITEM NO 9. Neonatal Resuscitation Baby

The Neonatal Resuscitation Baby should be a 7.5 lbs and 21 inches long newborn infant lifelike manikin with realistic landmarks used to train professionals in the practice of neonatal intubation and umbilical catheterization.

Features:
- Airway Management
- Infant Intubation Head - realistic life-size intubation trainer with a flexible tongue, arytenoid cartilage, epiglottis, vallecula, vocal cords, trachea, esophagus, and simulated lungs
- Head can be tilted forward, backward, or rotated 90 degrees to either side
- Head tilt facilitates the use of shoulder roll (3/4" to 1" thick)
- Realistic rise and fall of the chest
- The following skills can be practiced:
- Right mainstem intubation
- Nose and mouth suctioning
- Oropharyngeal and nasopharyngeal airway insertion
- Bag-Valve Mask Ventilation
- Chest compressions
- NG & OG Tubing Insertion
- Practice care, medication administration and removal
- Stomach reservoir to allow fluid return
- Umbilical Catheterization Procedures
- Umbilical reservoir to allow fluid return
- Retractable umbilical cord with two arteries and a vein facilitating high and low UAC and umbilical vein catheter procedure

Neonatal Resuscitation Baby includes:
- Infant, Full-body Manikin
- Replaceable Umbilical Cords (3)
- 1 Bottle of Simulated Umbilical Blood
- Manikin Lubricant
- Baby Pants
- Carry Case

BID SPECS FOR ITEM NO 7. Paediatric Intubation Trainer

- The Pediatric Intubation Trainer should be a life-like reproduction of a six-year-old child's torso designed
  to teach pediatric airway management skills.

Features:
- Realistic life-size intubation trainer with a flexible tongue, arytenoid cartilage, epiglottis,
  vallecula, vocal cords, trachea, esophagus, and simulated lungs
- Head can be tilted forward, backward, or rotated 90 degrees to either side
- Anatomically accurate airway allows sizing and insertion of various airway adjuncts
- **The following skills can be practiced:**
- Oral Intubation
- Nasal Intubation
- Digital Intubation
- Oropharyngeal Airway
- Nasopharyngeal Airway
- Basic Airway Management
- Suctioning Techniques
- Bag-Valve Mask Ventilation
- Realistic rise and fall of the chest
- Closed chest compressions

Pediatric Intubation Trainer should Includes
Airway Lubricant, Shorts, Carry Case

BID SPECS FOR ITEM NO 15. Nasogastric & Tracheal Care

- The NG Tube and Tracheal Care Trainer should be designed for instruction in the care of patients with respiratory conditions and the practice of gastrointestinal care procedures via nasal and oral access.

  Features:

  - Realistic life-size intubation trainer with a flexible tongue, arytenoid cartilage, epiglottis, vallecula, vocal cords, trachea, esophagus, removable dentures and simulated lungs
  - Head can be tilted forward, backward or rotated 90 degrees to either side
  - The following skills can be practiced:
  - Eye, ear and nose mouth care
  - Tracheotomy care
  - Tracheal suctioning
  - NG tube insertion and removal
  - NG tube irrigation, instillation and monitoring
  - Feeding tube insertion and removal
  - Gastric Lavage and Gavage
  - Nasoenteric and esophageal tube insertion, care, and removal
  - Oropharyngeal and nasopharyngeal insertion and suctioning
  - Insertion, securing and care of endotracheal tubes
  - Right mainstem intubation
  - Bag Valve Mask ventilation
  - Manually generated carotid pulse

  NG Tube and Tracheal Care Trainer should be supplied with:

  Adult Male Torso

  Manikin Lubricant

  Tank top and Carry Case

BID SPECS FOR ITEM NO 12. Catheterization & Enema Trainer

- The Catheterization and Enema Trainer is a life-size, female pelvis with interchangeable genitalia designed for practicing urologic and rectal access gastrointestinal care procedures.

Features:

- Realistic articulation enables proper positioning for procedures
- Interchangeable genitalia, with connectors and colon reservoir, facilitate enema administration using fluid for realistic return
- Genitalia, with connectors an urinary reservoir, facilitate urologic care procedures

- Perineal care
- Insertion of vaginal medications
- Indwelling catheter insertion, care, irrigation and removal
- Surgical bellyplate with interchangeable stoma sites allow simulation of cystostomy tube care
  and urinary diversion stoma care
- Dorsogluteal, ventrogluteal and vastus lateralis IM injections posssible
- Belly plate with interchangeable stomas serves as urinary reservoir
- Anal connectors which include a valve simulating the internal anal sphincter

Catheterization and Enema Trainer includes:

Adult female pelvis with upper thighs, Male and female genitalia with six (6) connectors Carry Case

BID SPECS FOR ITEM NO 5. Adult Multi-Venous IV Arm

The IV Training Arm Kit should include a full-size right arm with replaceable skin and veins designed for peripheral intravenous therapy.

Features:
- Anatomically accurate full arm model
- Rotation at deltoid for easier anterior and posterior vein access
- Multiple injection sites for IV insertion
- Dorsal veins of hand (3)
- Median Vein
- Basilic Vein
- Cephalic Vein
- Realism of the human arm in appearance, feel and resistance at puncture sites
- Palpable veins enable site selection and preparation
- Subcutaneous and intramuscular injections may be performed in the deltoid
- Infusible veins allow peripheral therapy with IV bolus or push injection method
- Replaceable skin and vein system ensure longevity of model
- Will articulate to other adult manikins

Male Multi-Venous IV Training Arm Kit includes:

Male Multi-Venous IV Arm

Replacement skin and multi-vein system

Blood concentrate

Blood Bag with Tubing and Connector

Clamp and Hook

5 Syringes

Manikin Lubricant

Carry Case

DEPTT OF COLLEGE OF NURSING – SR NO. 1 – SPECIFICATION FOR BASIC NURSING TRAINING MANIKIN

- Should allow Face and hair cleaning;
- Should have one normal eye and the other dilated:
- Should allow oral hygiene & denture care,Artificial carotid artery pulse with a pulse bulb,
- Should allow airway management
- Should allow the user to carry out aasal and oral gastric tubes insertion for Lavage/Nasal feeding and Oxygen aspiration
- Should allow Tracheostomy care
- Should allow the user to carry out suctioning via oral & nasal cavity and tracheal tube;
- Should have various IV skills: Highly lifelike I.V. training arm should enable dramatically realistic practice of IV puncture with realistic "pop" and blood backflow
- Artificial skin and blood vessels should be easy to replace.
- Should allow the user to carry out Intramuscular injection on deltoid, gluteal and vastus lateralis muscles
- Should allow colostomy and ileostomy irrigation and care
- Should allow drainage treatment care of closed thoracic drainage, pericardial drainage, T-tube drainage, peritoneal drainage, and pneumothorax
- Should have interchangeable male and female pudendum for catheterization and enema administration.
- The soft and durable penis can be adjusted to make an angle of 60 degree with abdominal wall. 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 and vaginal orifice. Specutum can be used in the vagina
- Should have an option of Fundus examination and assessment skills
- Should have soft abdominal wall with well contracted and "boggy" uterus which should allow for fundus examination.
- Soft and flexible pudendum should allow PV examination
- Should have an option of bedsore cleansing and dressing module(wearing type)
- Should have lifelike tactile sensation which should enable realistic practice of wound care, cleansing, bandaging, assessment, and length measurement;
- Should have an option of Hemostasia trainer
- Should have bleeding control arm & leg for emergency situation that main artery is damaged: severed limbs, trauma limbs.
- Artificial blood can be infused and arterial pressure can be simulated.
- Arterial blood should spurt out from wound. Hemostasia and bandaging can be practiced;
- Should have an option of Wound care and assessment
- This simulator simulates real weight of a normal adult and should reproduce realistic nursing scenarios for patient position changing and transportation,postmortem care,

hand&feet care, perineal care, sponge bath, changing cloth as well as heat and cold application.

Should have an option of AUDSim Module

- Should have normal and abnormal heart, breath and bowel sounds as well as patient voices for selection
- Should have user-friendly interface and should be easy to operate
- Should have five different kinds of sound that can be exported simultaneously or as selected, with indication of which sounds are being exported. Eight adjustable levels of volume for each kind of sound
- Should have chinese and English interfaces
- Sounds can be heard by either earphone or speaker. Or be exported by simulator directly
- Should be powered by 5V battery.

Should have an BPSim Module (Optional)

- Experience vivid blood pressure measurement training with real stethoscope and sphygmomanometer on articulating blood pressure training arm;
- Should have digital Korotkoff sound;
- Should have dynamic Hg indication of blood pressure with accuracy of 1mmHg;
- Systolic and diastolic blood pressures range from 0 to 300 mmHg and can be adjusted respectively. Pulse rate should be adjustable;
- Volume should be adjustable to meet different teaching requirements;
- Systolic & diastolic pressure, volume and heart rate should be displayed on LCD simultaneously
- Automatic calibration and low power consumption;
- The trainer arm should automatically shut down after 10-minute of non-operation.

- Should be supplied complete with the following
    - Standard Venous Nursing Manikin 1
    - BPSim module 1
    - AUDSim module 1
    - Replaceable lower limb module 1
    - Fundus examination module 1
    - Bleeding control arm and leg module 1
    - Decubitus module 1
    - Replaceable abdominal wall 4
    - Interchangeable vulva 1
    - Tauma modules 3
    - Carotid pump bulb 1
    - Clothes 1

DEPTT OF COLLEGE OF NURSING – SR NO. II – SPECIFICATION FOR OBSTETRIC BIRTHING TORSE

- Maternal-Fetal Simulator complete with anatomically realistic mother and fetus for comprehensive training in prenatal care, labor and delivery, and postpartum care.
- The Maternal Fetal Simulator should be wireless, high fidelity simulator with an automated delivery mechanism and maternal aesthetics like a real patient.
- Should have integrated maternal-fetal physiological and pharmacological modeling.
- All maneuvers & interventions should result in appropriate patient response automatically based on underling physiology of patient without any input from the instructor
- 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.
- Should be fully wireless with on-board fluids, pneumatics, and electrical systems
- Should include software licenses to support scenario writing and editing on any computer

Simulation should have following features
- Should have realistic birth canal with vulva/perineum supporting accurate fetal descent and rotation
- Should provide Multiple Birthing Positions: lithotomy, sitting, and all-fours
- Should allow vaginal examinations for evaluation of the cervix, fetal station, and position
- Should have static cervices representing various stages of dilation (closed to 10cm); effacement from 0-100%
- Should have palpable uterine contractions which can be detected by palpating the fundus
- Should have facility to allow Instructors to control the rate and duration of contractions
- Birthing fetus should not have any connection port at the head or buttocks for realistic presentation during   both vertex and breech deliveries
- Should have a customized fetus for Leopold's Maneuvers with hard head and soft buttocks
- McRoberts Maneuver should be possible
- Should have observable pelvic which should be registered in event log
- Should support and detect suprapubic pressure with palpable symphysis pubis
- Internal rotations with detection
  a   Support delivery of posterior arm during shoulder dystocia
  b   Should allow Zavanelli maneuver with detection
  c   Trendelenburg position with detection
  d   Left lateral tilt with detection
  e   Vertex and breech delivery
- Should have Fetal heart sounds – 4 locations based on fetal presentation
- Should have Articulated fetal body neck (with lateral neck movement), shoulders, elbows, hips, and knees
- Should have clinically accurate fetal size with tactile realism – 5th percentile on the WHO growth chart
- Fetus with palpable fontanel and sagittal suture
- Should allow Forceps application
- Should allow Vacuum extraction without fetal cap
- Should allow Fetal neck traction sensing
- Should allow Fetal airway suctioning
- Fetus should have audible cry upon delivery
- Predicted 1-minute and 5-minute APGAR scores based on integrated maternal-fetal physiology
- Should simulate postpartum hemorrhaging, including Class III hemorrhage
- Should allow for assessment of uterine atony (Contracted vs. Boggy Uterus)
- Should have facility bimanual compression and uterine massage detection

- Should exhibit
  - a Uterine blood released upon massage
  - b Uterine massage should automatically decrease rate of blood flow
  - c Uterine massage compression effect
  - d Uterine reversion
- Should support placing an Intrauterine balloon
- Umbilical cord can be cut and clamped
- Episiotomy should be possible
- Should have Intact/fragmented placenta with realistic color, texture and flexibility , placenta can be delivered with gentle traction
- Should have epidural port with infusion and aspiration
- Should support C-section team training

Mannequin should have following clinical features

a. Respiratory
- Manikin should have realistic upper airway with airway management
- Should have Advanced lungs with mechanical ventilation support
- Should Support endotracheal tubes, nasal-pharyngeal and oropharyngeal airways
- Should display spontaneous breathing
- Should have bag-valve-mask
- Should exhibit lung sounds: anterior and posterior
- Should have realistic chest excursion & Exhalation
- Should allow positive pressure ventilation

b. Circulatory System
- Should support real 4-lead ECG that can be connected to simulator
- Should display 12-lead ECG simulated in software
- Should have bilateral pulses: carotid, radial, and dorsalis pedis; with controllable pulse strength

c. Cardiovascular
- Should allow Chest compressions resulting in appropriate physiological changes.
- Should have advanced CPR analysis that should measure hand placement and compression depth, rate, and release
- Should support electrical therapy (defibrillation)
- Should allow Bilateral NIBP measurement
- Should have realistic Heart sounds linked to the physiology of the patient.

d. Nervous System
- Should simulate seizures with rhythmic movement of arms, rapid blinking, and jaw movement
- Should have Reactive pupils
- Should have Blinking
- Should have live and pre-recorded speech and should also have ability to import customized vocal sounds into system software

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

Patient Profiles & Scenarios

- Should be supplied with preprogrammed patient profiles with system software to write patient profiles as per training needs
- Should be supplied with pre programmed clinical scenarios (at least 10 nos.) with system software to modify existing scenario & write new scenarios as per training needs
- Pre programmed clinical scenarios should include :

a	A normal delivery	b	An instrumental vaginal delivery
c	Fetal Tachycardia due to Maternal Pyrexia	d	Breech delivery
e	Fetal central nervous system depression by narcotics given to the mother		
f	Shoulder dystocia	g	Major post-partum hemorrhage due to uterine atony
h	Maternal cardio-respiratory arrest	i	Eclampsia
j	Umbilical cord prolapse		

Should be supplied complete with

a   Wireless maternal mannequin - 01 no.
b   Software License - 04 nos.
c   Birthing feature - 01 no.
d   Fetus for Leopold's maneuvers - 01 no.
e   Abdominal for labor - 01 no.
f   Abdominal for Post Labor - 01 no.
g   Static cervices for vaginal examination - 01 set
h   Instructor wireless laptop – 01 no.
i   Simulated CTG Monitor – 01 no.

DEPTT OF COLLEGE OF NURSING – SR NO. III – SPECIFICATION FOR PEDIATRIC NURSING CARE

GENERAL FEATURES:

1. The simulator mannequin must be anatomically correct to replicate a real life sized paediatric patient with anatomical landmarks.
2. The simulator must have functional pupils that blink and can be adjusted for pupil dilation and restriction
3. The simulator must have automatic physiology response models that can objectively confirm airway management without the need for visual observation by an instructor
4. The simulator must have a hematology model for hemorrhage control showing the impact of progressive blood loss and compensation to the patient in real time
5. The simulator must have the capability to integrate a blood / secretions flow model for representation of trauma conditions to the patient
6. The simulator must have automatic physiological and pharmacological response models with responses to reflect the actual effects of the drug or multiple sets of drugs
7. The simulator and its accompanying components must be portable and easily stored when necessary.
8. The simulator must include a simulated patient monitor which has the capability to display the parameters below in addition to custom configurations
   - ECG I, II, III and V and heart rate
   - Arterial Blood Pressure
   - Pulmonary Artery Pressure
   - Pulmonary Capillary Wedge Pressure
   - Central Venous Pressure
   - Mean Arterial Pressure
   - Non Invasive Blood pressure
   - CO2 Capnography
   - SPO2
   - Heart rate
   - Thermolidution cardiac output and continuous cardiac output
   - Blood temperature
   - Body temperature

AIRWAY

1. Simulator must have a life like intubation head with a flexible tongue, epiglottis, aryepiglottic fold, cuneiform tubercle, corniculate tubercle, laryngeal inlet, vocal cords , esophagus and simulated lungs for spontaneous breathing and realistic chest movement and compressions
2. Simulator must have tracheal access through the neck for cricothyrotomy ,tracheostomy
3. The simulator must have the following standard ALS airway skills:
   - Bag/ valve/mask ventilation
   - Oral intubation
   - Nasal intubation
   - Esophageal intubation
   - Combitube placement
   - *LMA Placement*
   - Retrograde intubation
   - Fiber optic intubation
   - Light wand intubation
   - Cricothyrotomy

- Oropharyngeal and nasopharyngeal airway placement
4. Exhaled CO 2 Flow to confirm placement of airway devices with in the trachea
5. Signs of spontaneous respiration to include:
   - Independent right and left chest movement
   - Exhalation of air from mouth
   - Exhaled CO2 Capability.
6. Simulator must have a respiratory rate that is physiologically modeled or may be manually controlled by an instructor.
7. The simulator must be able to accommodate the following airway features:
   - Pharyngeal obstruction
   - Multiple levels of swollen tongue
   - Laryngospasm
   - Left & right broncheal obstruction
   - Stomach decompression
   - Cannot intubate, can ventilate
   - Cannot intubate, cannot ventilate

CARDIOVASCULAR SYSTEM:

1. The simulated patient should generate heart sounds including a range of pathological ones which are synchronized to the QRS complex of the ECG and should be audible with a standard stethoscope over the left and right upper sternal border, left lower sternal border and apex.

2. The simulator must have an integrated IV training arm with replaceable skin and veins, IV insertion into peripheral veins of forearm, anticubital fossa and the dorsum of the hand, simulated blood flash back on cannulation, IV Bolus or infusion.

3. A 5 Lead ECG capability emitted from the appropriate positions on the patient's chest for display on a standard monitor

4. Palpable carotid, radial, brachial, femoral, popliteal and pedal pulses which are synchronous to the ECG.

5. Simulator pulses must be dependent on BP of the patient and must be independently Controlled on left & right side of the body

6. A standard blood pressure cuff and sphygmomanometer can be used to assess systolic blood pressure by palpation or by auscultating Korotkoff sounds.

7. The invasive hemodynamic monitoring package should provide the capability to measure and monitor the following:
   - Arterial blood pressure
   - Left ventricular pressure
   - Central venous pressure
   - Right atrial pressure
   - Right ventricular pressure
   - Pulmonary artery pressure
   - Pulmonary artery occlusion (wedge) pressure
   - Thermodilution cardiac output

TRAUMA FEATURES:

Simulator must have the ability to perform the following trauma functions:
- Bi-Lateral Pneumothroax needle decompression
- Bi-lateral chest tube placement
- Blinking eye with adjustable pupil size
- Bulging Fontanel

IV DRUG ADMINISTRATION:

1. Simulator must have an intensive drug library that includes ACLS drugs.
2. The simulators response to drugs administered must be automatically linked to physiology and will not rely on manual input.

CARDIAC FUNCTIONS:

1. The simulator package must include an ECG library that contains an extensive library of physiological modeled cardiac rhythm variations
2. The simulator must be able to accommodate the following:
   - Live defibrillation from an AED and a manual defibrillator
   - Cardiac monitoring with blood pressures and cardiac output
   - 5 Lead ECG Monitoring
   - External pacing with various pacing threshold
   - Produce chest compression artifacts on ECG
   - Show a displayed heart rate and ECG on a compatible simulated monitor

BLOOD PRESSURE:

1. The simulator must have a blood pressure that can be taken either automatically, by auscultation or palpated.
2. The simulator must include a blood pressure arm that has Korotkoff sounds, which can be used for auscultation and palpation of the blood pressure.
3. The blood pressure must be able to be displayed on a compatible simulated monitor.

GENITOURINARY

1. The simulator must include both male and female genitalia which are interchangeable and anatomically correct
2. The genitalia must have the ability to be catheterized with the ability to produce urinary output.

NEUROLOGIC SYSTEM

1. Should model Cardiovascular and respiratory responses to sympathetic and parasympathetic activities

ADVANCED CARDIAC LIFE SUPPORT (ACLS) SYSTEM

1. **Airway Management and Ventilation:** Alveolar and arterial gas concentrations should appropriately reflect the efficacy of the employed ventilatory technique, such as mouth-to-mouth, bag-valve-mask, endotracheal intubation and transtracheal catheter ventilation. Administration of supplemental oxygen should extract automatic and appropriate patient clinical responses.

2. **Chest Compression: Should allow chest compression** In accordance with ACLS guidelines, effective chest compression of the patient's sternum should result in artificial circulation, cardiac output, central and peripheral blood pressures, palpable pulses and CO_2 return and Pressure fluctuations should be visible on invasive catheter waveforms..

2. **Cardiac Arrhythmias:** The instructor should be able to select and maintain a desired arrhythmia and control the simulated patient's response to clinical interventions.

3 **Electrical Therapy:** Both conventional defibrillators and automatic external defibrillators (AEDs) can be applied to the simulator generating appropriate patient response in real-time. Capable of applying transcutaneous pacemakers

4 **Pharmacological Therapy:** All IV drugs required by the ACLS algorithms should be supported.

SOUNDS AND PHONATION:
The simulator must have the ability to produce the following sounds:
Speaking through the instructor microphone
- Heart sounds which are synchronized with the ECG
- Independent left and right sounds
- Bowel Sounds
- Heart, lung and bowel sounds auscultated with a stethoscope.
- Independent volume adjustment

PATIENT & SCENARIOS
- Should be delivered with pre-programmed patients. System should have patient editor software to edit/ modify preconfigured patient profiles or to create new patient profile.
- Should be delivered with pre-programmed scenarios. System should have scenario editor software to edit/ modify preconfigured scenarios or to create new scenario.
- At any point during a simulation session it should be possible to capture the current state of a patient which can be used as a new patient.
- Should be capable of running multiple patients simultaneously to create multiple patient care simulations

EVENT LOG:
1. The simulator must include physiological, pharmacological event data that is logged and timed stamped.
2. The log must automatically calculate and log the following items:
- Alveolar and blood gases
- Cardiac Output
- Heart rate
- SPO2
- Invasive blood pressure
- Hematocrit and hemoglobin values
- Temperatures
3. The event long must be able to be saved and printed.

CONTROL SYSTEM :
Control system should be comprised of
- Instructors wireless remote control capable driving all software programme
- Instructor wireless remote control must be expandable for future software up-gradation.

DEPTT OF COLLEGE OF NURSING – SR NO. IV ADULT STIMULATOR

1. The human patient simulator should comprise of a life like mannequin. It should employ multiple models of 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 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) & peripherally (e.g. systemic vascular resistance, venous capacitance) to maintain circulation & 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., PaO_2, $PaCO_2$, and pH) and mixed venous gases (e.g., PvO_2, $PvCO_2$) 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.

5. 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 normocarbia 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.

6. 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.

7. 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.

8. 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.

9. 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, oxyhemoglobin saturation, and overall cardiopulmonary stability.
10. The patient simulator should have trauma simulation capabilities, such as:
    A. Surgical cricothyroidotomy
    B Articulated mandible
    C Neck articulation
    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.
11. The patient simulator should have fully independent left and right lungs.
A. 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)
12. 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 manually to different settings (i.e., pinpoint, reactive, non reactive, blown).
13. The patient simulator should be capable of physically shaking, giving a visible cue of convulsions, tremors, or other similar conditions.
14. The patient simulator should have touch activated, bi-lateral palpable pulses in the following locations: Carotid, Brachial, Radial, Femoral, Popliteal, Pedal (dorsalis and tibialis)
15. 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.
16 The patient simulator should include independent simulations of patients (e.g., young healthy male, pregnant female, elderly patient with coronary artery disease) and injury/disease scenarios (e.g., anaphylactic shock, ruptured spleen, subdural hematonia.)
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 software patients simultaneously to create multi-patient care simulations.
C. It should be possible to run multiple injury/disease scenarios simultaneously on a particular patient to create multi-trauma simulations.
17. The patient simulator should include educationally complete properly documemnted clinical simulations including information : Clinical background and scene, Pre-hospital and emergency

department learning objectives, Student critical actions, Simulation algorithm, Equipment required for the simulation, and Instructor notes etc.

18. Patient simulator should be supplied complete with

a) Disaster/ Casualty kit which allows the patient to automatically physically bleed in various locations simultaneously and excrete body fluids from the eyes, ears, and mouth.

b) Wireless instructors workstation communicating over RF (radio frequency) allowing it to be located up to 150 feet away from the patient mannequin during simulation /training exercise

c) Should have the facility to run control software and monitor waveform display on same instructor's workstations thus allowing to use it for developing simulations at other locations independent of the patient mannequin.

19. Scope of supply should include on-site training by the supplier covering fundamentals of set-up and operation and simulation design