



Running Contract Details	
Equipment Name	FULL-BODY HIGH FIDELITY PATIENT SIMULATORS VARIOUS TYPES
Running Contract Valid Till	22-03-2024
Tender Ref No	KMSCL/EP/T385/1457A/2020
Tendered Quantity	5
Supplier Name	M/s BNS HEALTH AIDS
GST No	07BHYP9311L1ZD
Installation & Delivery Period	8 Week(s)
Up-time / PM vist	95% & 4 Visits per year
Warranty period	3 Years

Supplier`s Details		
Address	Contact Details	
3363 2ND FLOOR MAHINDRA PARK OPP. ANDHRA BANK RANI BAGH DELHI - 110034	Contact Person	RAJESH KUMAR SHARMA
	Phone	
	Mobile No	9999033454
	Email	bnshealthdelhi@gmail.com

Item-wise Price Details				
#	Item Details	Unit Rate (Incl.all taxes & charges)	Service Charges (Through KMSCL)	Grand Total
1	Full-Body High Fidelity Patient Simulators (Adult Male & Adult Female) <i>Model & Make : SimMan 3G Laerdal Medical</i>	14825219.1 Incl.GST :18%	1037765.34	15862984.44
2	Full-Body High Fidelity Patient Simulators (Infant & Child) <i>Model & Make : Sim Baby & Sim Junior Laerdal Medical</i>	12273403.02 Incl.GST :18%	859138.21	13132541.23
3	Full-Body High Fidelity Patient Simulators (Maternal and fetal manikin) <i>Model & Make : Sim Mom Laerdal Medical</i>	7858396.44 Incl.GST :18%	550087.75	8408484.19
4	Full-Body High Fidelity Patient Simulators (Neonatal) <i>Model & Make : Sim New B Laerdal Medical</i>	5402876.62 Incl.GST :18%	378201.36	5781077.98
		40359895.18	2825192.66	43185087.84

Annual / Comprehensive Maintenance Charges (Exl.Tax)							
Rate	4 th Year	5 th Year	6 th Year	7 th Year	8 th Year	9 th Year	10 th Year

Annual / Comprehensive Maintenance Charges (Exl.Tax)							
Full-Body High Fidelity Patient Simulators (Adult Male & Adult Female)							
Labour	0.00	2,51,275.00	2,51,275.00	2,51,275.00	2,51,275.00	2,51,275.00	2,51,275.00
Comprehensive	5,02,550.00	5,02,550.00	5,02,550.00	5,02,550.00	5,02,550.00	5,02,550.00	5,02,550.00
Full-Body High Fidelity Patient Simulators (Infant & Child)							
Labour	2,08,024.00	2,08,024.00	2,08,024.00	2,08,024.00	2,08,024.00	2,08,024.00	2,08,024.00
Comprehensive	4,16,048.00	4,16,048.00	4,16,048.00	4,16,048.00	4,16,048.00	4,16,048.00	4,16,048.00
Full-Body High Fidelity Patient Simulators (Maternal and fetal manikin)							
Labour	1,33,193.00	1,33,193.00	1,33,193.00	1,33,193.00	1,33,193.00	1,33,193.00	1,33,193.00
Comprehensive	2,66,386.00	2,66,386.00	2,66,386.00	2,66,386.00	2,66,386.00	2,66,386.00	2,66,386.00
Full-Body High Fidelity Patient Simulators (Neonatal)							
Labour	91,574.00	91,574.00	91,574.00	91,574.00	91,574.00	91,574.00	91,574.00
Comprehensive	1,83,148.00	1,83,148.00	1,83,148.00	1,83,148.00	1,83,148.00	1,83,148.00	1,83,148.00

Other terms & conditions

1. The supplier shall execute an agreement with the purchaser as per tender conditions (agreement format is given in the tender document).
2. The supplier shall submit performance security amounting to 5.00% of the value of the supply order.
3. The labour & comprehensive charges of equipment after the completion of warranty period is finalized by KMSCL as mentioned above.
4. Since discount rate is not applicable for equipment under Running Contract of KMSCL, purchase/supply order can be issued directly to supplier at the given rate with tax & other charges (exclusive of KMSCL service charges).
5. If purchase/supply order is issued directly to the supplier, KMSCL service charge need not be paid. But the copy of the said order may be forwarded to KMSCL for information.

Technical Specification

Equipment :Full-Body High Fidelity Patient Simulators (Adult Male & Adult Female)

1. Adult simulator

A. General

The Adult simulator should have following features

- a. The system shall consist of a tetherless adult manikin Instructor PC, and a touch screen patient monitor.
- b. The simulator should be capable of being operated on the fly, have pre-programmed cardiac, respiratory and neurological scenarios and be capable of programming by instructors
- c. The simulator should look realistic and resemble the physique of a normal adult.
- d. The simulator system should be completely wireless, rugged and self-contained internal electrical and pneumatic power, so that it will be easy for operations and can be used for mobile simulation.

- e. The simulator should have an internal battery that will last at least 4 hours in normal usage or more.
- f. The internal compressor operational sounds shall not interfere with the auscultation of manikin sound
- g. The internal compressor operation shall not cause unwanted manikin body movement

A. Manikin

I. Airway

a. Features

- i. Should have Controllable open/closed airway; automatically or manually controlled
- ii. Should allow Head tilt/Chin lift
- iii. Should allow Jaw thrust with articulated jaw
- iv. Should allow Suctioning (Oral & Nasopharyngeal)
- v. Should allow Bag-mask ventilation
- vi. Should allow Orotracheal intubation
- vii. Should allow Nasotracheal intubation
- viii. Should allow Supra-glottic devices placement
- ix. Should allow Endotracheal tube intubation
- x. Should allow Retrograde intubation
- xi. Should allow Fiberoptic intubation
- xii. Should allow Transtracheal jet ventilation
- xiii. Should allow Needle cricothyrotomy
- xiv. Should allow Surgical cricothyrotomy
- xv. Should have Variable lung compliance
- xvi. Variable airway resistance
- xvii. Should have right main stem intubation
- xviii. Should allow Stomach distention during esophageal intubation

b. Airway complications

- i. Should have Can't intubate/ can ventilate conditions.
- ii. Should allow Tongue edema
- iii. Should have Pharyngeal swelling
- iv. Should have Laryngospasm
- v. Should allow Decreased cervical range of motion
- vi. Should have Trismus

II. Breathing

a. Features

- i. Should have simulated spontaneous breathing with capability of displaying different depths of respiration.
- ii. Should have Bilateral and unilateral chest rise and fall
- iii. Should have Normal and abnormal auscultatable breath sounds in different lung areas

b. Complications

1. Should have Cyanosis when the saturation comes down.
2. Should have facility for Needle thoracentesis – bi-lateral
3. Should have facility for Unilateral & Bilateral chest movement
4. Should have facility for Chest tube insertion
5. Should have facility to adjust resistance and compliance allowing to simulate a vast number of patient disease states – with realistic chest rise.
6. Ventilation
7. Should be able to demonstrate various modes and troubleshooting of patient ventilator interface
8. Should have an automatic physiological response to adverse respiratory events like arrest, inadequate efforts etc without needing operator intervention

I. Circulation

a. Cardiac features

1. Should have extensive ECG library
2. Heart sounds – Normal & abnormal four anterior locations
3. ECG rhythm monitoring from limb/chest leads
4. 12 lead ECG display
5. Defibrillation and cardioversion (Should be able to interface with a biphasic clinical defibrillator and AED)
6. Pacing

a. Circulation features

1. Should have facility to measure BP manually by auscultation of Korotkoff sounds
2. Should have Carotid, femoral, brachial, radial, dorsalis pedis, popliteal and posterior tibialis pulses synchronized with ECG
3. Pulse strength should be variable with BP
4. Pulse Palpation should be detected& logged
5. Should have IV access
6. Should have Intraosseous access
7. Should have an automatic appropriate physiological response to events that affect the CVS like bleeding, hypotension etc without need for operator intervention

a. CPR

1. Should be Compliant with 2015 AHA / ILCOR Guidelines
2. CPR compressions should generate palpable pulses, blood pressure wave form, and ECG artifacts
3. Should have Realistic compression depth and resistance
4. Should provide real time feedback on quality of CPR

I. Pharmacology

1. Should have an extensive library of commonly used drugs in the software
2. Should have automatic Drug Recognition System capable of demonstrating appropriate physiological response to simulated drugs which should be dose dependent with an optional pharmacokinetics and pharmacodynamic models

I. Other features

a. Eyes

1. Should have blinking to indicate a conscious patient
2. Should have Open, closed lid positions
3. Should have pupillary reactions to light
4. Should demonstrate abnormal pupils

a. Seizures

1. Should be capable of simulating Seizure/Fasciculation

a. Fluids

1. Should allow Bleeding
2. Should simulate bleeding at multiple sites
3. Arterial and venous
4. Vital signs should automatically respond to blood loss & therapy
5. Urine output (variable)
6. Foley catheterization
7. Should have Secretions at Eyes, Ears, Nose, Mouth
8. Should simulate Diaphoresis

a. Sounds

1. Should have Bowel Sounds
2. Patient Voice
3. Pre-recorded sounds
4. Custom sounds
5. Instructor can simulate the patient's voice wirelessly

a. Optional features

1. The capability to demonstrate an integrated ultrasound simulation platform

A. Instructor Workstation

- i. Hardware - Should have an instructor workstation computer which will wirelessly control the manikin
- ii. Software - Should have physiologically driven software which can automatically control the manikin physiology with minimal

instructor intervention

A. Monitor

- i. Wireless and touch screen
- ii. Highly configurable
 - a. Should depict all the wave forms that are capable of being displayed in a standard clinical patient monitor
 - b. The system shall permit multi-media images, videos, X Rays and Lab data to be inserted into simulations via the touch screen patient monitor.

Equipment :Full-Body High Fidelity Patient Simulators (Infant & Child)

1. Infant & Child

A. General

The Infant and Child simulators should have the following features

- a. The system shall consist of an infant and a Child manikin, an Instructor PC, and a touch screen patient monitor.
- b. The simulator should be capable of being operated on the fly, have pre-programmed cardiac, respiratory, and neurological scenarios, and be capable of programming by instructors
- c. The simulator should look realistic and resemble the physique of an infant and 6-8-year-old child.
- d. The compressor operational sounds shall not interfere with the auscultation of manikin sound
- e. The compressor operation shall not cause unwanted manikin body movement

A. Manikin

I. Airway

a. Features

1. Should have Controllable open/closed airway; automatically or manually controlled
2. Should allow Suctioning (Oral & Nasopharyngeal)
3. Should allow Bag-mask ventilation
4. Should allow Orotracheal intubation
5. Should allow Nasotracheal intubation
6. Should allow Supra-glottic devices placement
7. Should allow Endotracheal tube intubation
8. Should have Variable lung compliance
9. Surgical airway (Optional)
10. Variable airway resistance
11. Should have right main stem intubation
12. Should allow Stomach distention during esophageal intubation
 - a. Airway complications

1. Should have Can't intubate/ can ventilate conditions.
2. Should have Can't intubate/ can't ventilate
3. Optional facility to show Tongue edema, Pharyngeal swelling and Laryngospasm

I. Breathing

a. Features

1. Should have Simulated spontaneous breathing with capability of displaying different depth of respiration.
2. Should have Bilateral and unilateral chest rise and fall
3. Should have Normal and abnormal auscultatable breath sounds

a. Breathing Complications

1. Optional ability to show Cyanosis when the saturation comes down.

2. Should have the capability of simulating pneumothorax
3. Should have facility for unilateral Needle thoracentesis
4. Should have facility for Unilateral & Bilateral chest movement
5. Should allow Unilateral, Bilateral & lobar breath sounds
6. Should have facility to adjust resistance and compliance allowing to simulate a vast number of patient disease states – with realistic chest rise.

I. Circulation

a. Cardiac Features

1. Should have extensive ECG library
2. Heart sounds – Normal & abnormal four anterior locations
3. ECG rhythm monitoring
4. 12 lead ECG display
5. Defibrillation and cardio version (Should be able to interface with a biphasic clinical defibrillator and AED)
6. Pacing

a. Circulation Features

1. Should have facility to measure BP manually by auscultation of Korotkoff sounds
2. All standard pulses shall be synchronized with ECG.
3. Pulse can be turned “on” and “off”.
4. Should have IV access
5. Should have Intraosseous access
6. Should have automatic Drug Recognition System capable of demonstrating appropriate physiological response to simulated drugs

a. CPR

1. Should be Compliant with 2015 PALS Guidelines
2. CPR compressions should generate palpable pulses, blood pressure wave form, and ECG artifacts
3. Should have Realistic compression depth and resistance
4. Optional provision for real time feedback on quality of CPR by an integrated software/through an external device.

I. Others

1. Eyes shall include capability of changing pupillary size, representing normal, constricted and dilated pupils
2. The manikin shall be able to transmit voice sounds via prerecorded files and/or files created by the end-user.
3. The manikin shall present vocal sounds.
4. Simulator should have life-like traits such as a fontanelle that can be adjusted to present as normal or bulging (for infants)
5. Should be capable of simulating Seizure/Fasciculation

A. Instructor Workstation

- I. Hardware - Should have an instructor workstation computer which will wirelessly control the manikin
- II. Software - Should have physiologically driven software which can automatically control the manikin physiology with minimal instructor intervention

A. Monitor

- I. Touch screen at least 24”HD monitor
- II. Highly configurable
 - a. Should depict all the wave forms that are capable of being displayed in a standard clinical paediatric patient monitor
 - b. The system shall permit multi-media images, videos, X Rays, and Lab data to be inserted into simulations via the touch screen patient monitor.

Note: L1 will be declared individually

Equipment :Full-Body High Fidelity Patient Simulators (Maternal and fetal manikin)

1. Maternal and fetal manikin,

A. General

A. The Adult simulator should have the following features

- a. The system shall consist of a tether less adult manikin Instructor PC, and a touch screen patient monitor.
- b. The simulator should be capable of being operated on the fly, have pre-programmed cardiac, respiratory, and neurological scenarios and be capable of programming by instructors
- c. The simulator should look realistic and resemble the physique of a normal adult.
- d. The Software should run with mathematical models of physiology and pharmacology
- e. The simulator system should be completely wireless, rugged, and self-contained internal electrical and pneumatic power so that it will be easy for operations and can be used for mobile simulation.
- f. The simulator should have an in-built battery backup.

- a. The manikin shall have an internal battery that will last at least 4 hours in normal usage or more.
- b. The internal compressor operational sounds shall not interfere with the auscultation of manikin sound
- c. The internal compressor operation shall not cause unwanted manikin body movement
- d. The maternal manikin should exhibit a physiological response to adverse events automatically without needing operator intervention
- e. The maternal manikin should have the optional capability to interface seamlessly with a clinical ventilator. The capability to trigger the ventilator is optional.
- f. Bronchial occlusion
- g. Airway resistance
- h. Demonstrate the Mechanism of labour as an optional feature

a. Cardiac Features should include

- a. Extensive ECG library
- b. Heart sounds synchronized with ECG
- c. ECG rhythm monitoring
- d. 12 lead ECG display on the optional patient monitor
- e. Defibrillation and cardioversion
- f. Pacing
- g. Should support chest compressions as per AHA 2015 guidelines and feedback on software or external device, with updatable software support with no extra cost.
- h. Should have advanced CPR metrics shown in software or external device with details of the rate of CPR, depth, recoil percentage and other factors of CPR.
- i. CPR Should get automatically logged

a. Circulation Features should include

- a. BP measured manually by auscultation of Korotkoff sounds
- b. Should have pulses to be palpated in two are more major arteries with an option to provide other arterial pulses used in resuscitation and clinical scenarios.
- c. The pulse should be physiologically driven
- d. Pulses should get automatically senses and should be independently controllable.
- e. Pulse strength variable with BP
- f. Pulse Palpation is detected & logged
- g. CPR compressions generate palpable pulses, blood pressure waveform, and ECG artifacts
- h. Detection and logging of compressions starting and stopping.
- i. Vascular features should include;
- j. Presorted IV access (both arms).
- k. Subcutaneous and intramuscular injection sites
- l. Should have an active flashback of IV fluid

1. Obstetric Maternal manikin

- a. Maternal simulator should be training solution for novice learners and healthcare providers alike to practice and prepare for critical events so that more lives can be saved.
- b. The system shall consist of a tetherless adult pregnant manikin Instructor PC and a touch screen patient monitor.
- c. The system shall be capable of operating pre-programmed pregnancy-related scenarios, “on the fly” (modify the parameters of the scenario in real-time) and programming of new scenarios
- d. Other features should include;
 - i. Uterine activity waveform (History and Live)
 - ii. Manual control over all parameters
- e. It also should allow a non-gravid abdomen to expand the scope of the simulation training.
- f. Simulators should focus learners on all stages of labor, from antepartum to post-partum.
- g. Movement and positioning of the manikin should include-
 - i. Realistic limb positioning capability especially for lithotomy position to facilitate delivery
 - ii. Semi-recumbent positioning
 - iii. Left lateral positioning
 - iv. Should support multiple birthing positions including squatting
 - v. Trendelenburg detection

Labour

- i. Bony Pelvis with landmarks
- ii. A cervix that dilates to full
- iii. Realistic vulva for digital exams
- iv. Birth canal
- v. Should deliver baby automatically. Should have the capability of normal and various abnormal labor including breech and shoulder dystocia. Should possess the ability to perform various maneuvers for shoulder dystocia which should be automatically logged. The fetal release should be controllable and programmable through the instructor workstation so that the instructor can determine which maneuver will release the fetus
- vi. Interchangeable uterus modules:
 - i. PPH uterus with tonic and atonic/ boggy states and with retained placenta with capability of demonstrating bleeding
 - ii. Uterine inversion
 - iii. The manikin should be capable of detecting uterine massage and respond within the contraction of the uterus as appropriate

1. Fetal manikin

Optional provision of the fetal manikin with the below features may be provided

- i. Realistically modeled head with all head landmarks present (fontanelles and sutures)
- ii. Head designed and tested so it can be used for forceps deliveries (rotational and normal) and vacuum delivery
- iii. The delivery process should simulate a realistic fetal descent and rotation for normal and abnormal deliveries
- iv. Mouth for suction
- v. Realistically positioned landmarks - scapulae and clavicles
- vi. Arms and legs allow full articulation for all maneuvers required during deliveries - particularly breech and shoulder dystocia
- vii. Umbilicus and placenta (normal and retained)
- viii. Should be able to demonstrate the cardiac activity of fetus/baby as an optional feature
- ix. Optional facility for the Delivered baby to demonstrate physiological APGAR score
- x. Optional facility for the baby for automatic cry after birth depending on APGAR score
- xi. Capability to interface with augmented reality devices is optional

Equipment :Full-Body High Fidelity Patient Simulators (Neonatal)

1. Neonatal;

1. General

The Neonatal simulator should have the following features

- a. The system shall consist of a neonatal manikin, Instructor PC, and a touch screen patient monitor.
- b. The simulator should be capable of being operated on the fly, have pre-programmed cardiac, respiratory and neurological scenarios, and be capable of programming by instructors
- c. The manikin should exhibit a physiological response to adverse events automatically without needing operator intervention
- d. The simulator should look realistic and resemble the physique of a full-term, 50th percentile newborn.
- e. The compressor operational sounds shall not interfere with the auscultation of manikin sound
- f. The compressor operation shall not cause unwanted manikin body movement

i. Manikin

a. Airway Features

- i. Should have Controllable open/closed airway; automatically or manually controlled
- ii. Should allow Suctioning (Oral & Nasopharyngeal)
- iii. Should allow Bag-mask ventilation
- iv. Should allow Orotracheal intubation
- v. Should allow Supra-glottic devices placement
- vi. Should allow Endotracheal tube intubation
- vii. Should have Variable lung compliance
- viii. Variable airway resistance
- ix. Should have right main stem intubation
- x. Should allow Stomach distention during esophageal intubation

b. Airway complications

- i. Should have Can't intubate/ can ventilate conditions.
- ii. Should have Can't intubate/ can't ventilate
- iii. Optional facility to show Tongue edema, Pharyngeal swelling, and Laryngospasm

c. Breathing Features

- i. Should have Simulated spontaneous breathing with the capability of displaying different depths of respiration.
- ii. Should have Bilateral and unilateral chest rise and fall
- iii. Should have Normal and abnormal auscultate breath sounds

d. Breathing Complications

- i. Should have Cyanosis when the saturation comes down.
- ii. Should have the capability of simulating pneumothorax
- iii. Should have facility for Needle thoracentesis – bi-lateral
- iv. Should have facility for Unilateral chest movement
- v. Should allow Unilateral, Bilateral & lobar breath sounds
- vi. Should have the facility to adjust resistance and compliance allowing to simulate a vast number of patient disease states – with realistic chest rise.
- vii. Optional facilities for needle thoracocentesis

e. Circulation

a. Cardiac features

- ii. Should have extensive ECG library
- iii. Heart sounds – Normal & abnormal four anterior locations
- iv. ECG rhythm monitoring (5-lead)
- v. 12 lead ECG display
- vi. Defibrillation and cardio version (Should be able to interface with a biphasic clinical defibrillator and AED)
- vii. Pacing

a. Circulation features

- i. Should have facility to measure BP manually by auscultation of Korotkoff sounds
- ii. Umbilical and Brachial pulses shall be synchronized with ECG.
- iii. Manikin shall allow the umbilical cord to be assessed, cut, and catheterized.
- iv. Umbilical catheterization with blood return shall be possible
- v. Pulse can be turned “on” and “off”.
- vi. Should have IV access
- vii. Should have Intraosseous access
- viii. Should have automatic Drug Recognition System capable of demonstrating appropriate physiological response to simulated drugs,
 - a. CPR

- i. Should be Compliant with 2015 NALS Guidelines
- ii. CPR compressions should generate palpable pulses, blood pressure wave form, and ECG artifacts
- iii. Should have Realistic compression depth and resistance
- iv. Should provide real time feedback on quality of CPR
 - a. Other features

- i. Eyes shall include interchangeable pupils, representing normal, constricted and dilated pupils
- ii. The manikin shall display movement in all four limbs: Limp, Tone, Spontaneous Motion and Seizure
- iii. The manikin shall be able to transmit voice sounds via prerecorded files and/or files created by end-user.
- iv. The manikin shall present vocal sounds such as Content, Hiccups, Grunting, Strong Cry, Weak Cry, Cough, and Scream.
- v. The manufacturer shall make available a meconium module for suction removal.
- vi. Should be capable of simulating Seizure/Fasciculation

1. Instructor Workstation

- a. Hardware - Should have an instructor workstation computer which will wirelessly control the manikin
- b. Software - Should have physiologically driven software that can automatically control the manikin physiology with minimal instructor intervention

2. Monitor: Touch screen at least 24" HD monitors

- a. Highly configurable
- b. Should depict all the wave forms that are capable of being displayed in a standard clinical neonatal patient monitor
- c. The system shall permit multi-media images, videos, X Rays, and Lab data to be inserted into simulations via the touch screen patient monitor.