STORE SECTION (D.O.)

ALL INDIA INSTITUTE OF MEDICAL SCIENCES
ANSARI NAGAR, NEW DELHI – 110029

Ref. No. XX-221/SO(DO)/Paeds/2025-26/M&E **Dated: 10.03.2026**

CORRIGENDUM

It is informed that the tender bearing no. XX-221/SO (DO)/Paeds/2025-26/M&E and CPP tender I.D. No. 2026_AIMSD_897160_1, procurement of Lung Clearance Index Measurement System, was published through CPP portal has revised technical specification & dates of tender has been extended, as per TSEC recommendation and detail given below:

Sl. No.	DETAIL	EXISTING	AMENDED/EXTENDED
1.	Bid submission END Date	12.03.2026	23.03.2026
2.	Bid Opening Date	13.03.2026	24.03.2026
3.	Technical Specification	Enclosed revised technical specification. **Annexure-I**	

All other terms & condition of the tender are same.

10/03/2026

STORE OFFICER (DO)

ANNEXURE-I

Department of Pediatrics, AIIMS, New Delhi

Lung clearance Index Measurement System

Quantity: One

Specifications

1. The modular equipment should perform lung clearance index (LCI) in 1-month infantsto children till 18 years of age at normal tidal breathing.
2. It should be able to perform both single and multiple-breath washout technique.
3. LCI measurement should be based on FRC (Functional Residual Capacity) measurement.
4. The flow measurement accuracy should be within 5±,% across the range of flows encountered during clinical testing.
5. The volume accuracy should be within 3±1%.
6. Sample flow shouldbe 20 mL/min or less when gas sample point is proximal to flow meter.
7. Gas analyser accuracy should be within 1±1% at higher concentration (e.g. 80% N2) and it should within 5±2%at lower concentration (e.g. 2 % N2).
8. Gas analyser rise time should be near 100 ms between 10–90% flow.
9. Data sampling frequency should be $\geq$ 100 Hz for both flow and inert gas concentration measurement.
10. Alignment accuracy for synchronisation of flow and gas signals should be within 10 ms.
11. Total equipment dead space should be <2 mL/kg for children and <1 mL/kg for infants.
12. Both corrected and uncorrected values should be reported.
13. FRC and ventilation inhomogeneity indices must relate to the same geometric reference point in the airstream.
14. The tracer gas to measure FRC (Functional Residual Capacity) should be sulfur hexafluoride (SF6) or helium or nitrogen.
15. **The equipment should be provided with following modules/tests:**

(A) Tidal breathing flow volume analysis (TBFVL)

(1) Should be able to perform TBFVL from neonates to children up to 5 years of age.

(2) Flow should be measured by ultrasonic transit time.

(3) Flow detection limit should be 0.4-0.8 ml/s.

(4) Sampling frequency should be between 50- 200 Hz

(5) Flow accuracy should be ± 2 %

(6) Dead space should be less than 4 ml for newborn set.

(7) Pressure measurement accuracy should be 0.015- 0.02 kPa

(8) Pressure detection limit should be 0.015 -0.02 kPa.

(9) Should provide at least following parameters: Inspiratory time (t_I), expiratory time (t_E), total respiratory time (t_{tot}), time to peak tidal inspiratory or expiratory flow (t_{PTIF} or t_{PTEF}), Tidal volume (V_T), inspiratory or expiratory tidal volume (V_I or V_E), Peak tidal inspiratory or expiratory flow (**PTIF** or **PTEF**), Mid tidal inspiratory or expiratory flow (**MTIF** or **MTEF**), Tidal expiratory flow (**TEF**) at 75, 50, 25 or 10% of tidal expiratory volumestill have to be expired ($\mathbf{TEF_{75}}$, $\mathbf{TEF_{50}}$, $\mathbf{TEF_{25}}$ or $\mathbf{TEF_{10}}$), Ratio of inspiratory or expiratory time to total respiratory time (t_I/t_{tot} or t_E/ % t_{tot}), inspiratory to expiratory time (t_I/t_E),Peak ratio: time to PTEF to t_E(t_{PTEF}/t_E), Ratio of exhaled volume to PTEF to tidal expiratory volume (V_{PTEF}/V_E), Ratio of TEF_{75},TEF_{50}, TEF_{25} or TEF_{10} to peaked tidal expiratory flow (**PTEF**)

(B) **Forced volume measurements by raised volume rapid thoraco-abdominal compression and rapid thoraco-abdominal compression (RVRTC and RTC)technique.**

(1) It should be able to perform RVRTC and RTC in newborn, infants, and preschool children.

(2) Should provide at least following parameters: Maximum expiratory flow at functional residual capacity ($V'_{max,FRC}$), Maximum expiratory flow at 50% or 70% of expiration (V'_{50} or V'_{70}), Volume to peak expiratory flow (V_{PEF}), Forced expiratory volume (**FEV**), FEV at 0.5, 0.75 or 1.0 s of the forced expiration ($\mathbf{FEV_{0.5}/FEV_{0.75}/FEV_{1.0}}$), Maximum expiratory flow at 25% or 10% of FVC ($\mathbf{MEF_{25}}$ **or** $\mathbf{MEF_{10}}$), Forced expiratory flow between 25% and 75% of FVC

($\mathbf{FEF_{25-75}}$), Peak expiratory flow (**PEF**), Ratio of forced expiratory volume at 0.5 s to total forced expiratory volume % ($\mathbf{FEV_{0.5}/FEV}$).

(C) FRC/lung volumes measurement

(1) It should measure lung volumes and airway resistance in newborn, infants, and preschool children.

(2) Frequency response (amplitude and phase) should be satisfactory to 10 Hz with the combined time constant should be 10 – 14 s.

(3) There should be a linear response to known inputs over a range of appropriate breathing frequencies (e.g. 20 – 100 breaths per minute (bpm).

(4) It should be able to measure FRC in range of volumes 30 – 500 mL, at frequencies 20 – 100 breath per minute.

(5) The pneumotachometer (PNT) must be linear over the range of flows encountered and it should remain linear when heated.

(6) The combined dead space of the PNT and occlusion shutter should be < 2 mL/kg to minimize dead space.

(7) At least three sets of breathing apparatus should be provided for different size of infant/ child.

(8) The resistance of the combined apparatus should be <20% of the infant's intrinsic resistance at the highest flow likely to be encountered, i.e. in term neonates, <0.7 kPa.L-1.s at 166 mL.s-1, whereas for a 1-yr-old, it may be 0.5 kPa.L-1.s at 500 mL . s-l.

(9) For airway resistance measurements, a two-valve system should be provided

(10) Automated closure should be feasible at end inspiration (EI), end expiration (EE), or other points through the breath as specified by the user.

(11) Speed of valve opening and closing (excluding any lag time) should be <75 ms.

(12) The reports of FRC should be based on atleast two complete respiratory efforts against the occlusion with the occlusion for at least 10 s.

(13) The shutter must be able to withstand pressures of 3 kPa without any leaks or compressive effects.

(14) A "shutter test" should be incorporated within the software and calibration protocol, so that the shutter can be checked prior to each study occasion.

(15) The shutter must be easy to clean and reassemble. It should be light, with a suitable means of support and easy manipulation within the box.

(16) Activation of the shutter should result in minimal volume change within the box and be as quiet as possible to avoid disturbing the infant or altering sleep state.

(17) Dead space of the mask should be minimal and < 50% of total volume.

(18) Mask should fit firmly with the infant's face.

(19) The use of therapeutic putty to achieve a good, airtight seal of mask is allowed.

(D) Fractional exhaled Nitric Oxide (FeNO) and nasal nitric oxide (nasal NO)

(1) FeNOand Nasal NO measurements by multiple and single breath technique should be in accordance to ATS / ERS recommendations.

(2) It should be based on chemiluminescence technique.

(3) Should be able to measure concentration of nitric oxide in exhaled breath (FeNO).

(4) Should be able to measure nasal nitric oxide (nasal NO) production.

(5) It should have a measuring range of 1 or less to 5000 or more ppb.

(6) It should have linearity of ±1% or less.

(7) It should have a selectable sample flow between 100 to 500 ml/min.

(8) Minimum flow detection should be 1 ml or less.

(9) Accuracy of flow measurement should be ±2% or less.

(10) It should have alerts for low battery, high NO levels, and device malfunctions.

(11) It should have an inbuilt ozone generator.

(12) The sample flow rate should be between 1-5 ml/sec.

16. The system should be supplied with a compatible computer system (i7 or later, 2 GB or more RAM, 1 TB or more hard disk).
17. It should be supplied with a laser colour printer with a feature of printing both sides of a page and wi-fi enabled.
18. It should be provided with an UPS that should last at least three hours or more.
19. Required gas cylinders should be provided along with the equipment.
20. One extra set of cylinder/s should be provided so that equipment functioning is not paused when a cylinder is taken for re-filling.
21. The cylinders should be filled free of cost during two years of warranty.
22. All software for above modules should be supplied with full functionality.

23. The software should be upgraded free of cost as and when new version is released for next 10 years (2 years warranty plus 8 years CMC).
24. The price may be quoted for total set and individual modules separately.
25. The system should run on 220 V/50 Hz AC.
26. It should operate within a temperature range of 5 to 45°C.
27. It should work between 10 to 90% relative humidity.
28. It should be US/FDA or European CE OR BIS approved.
29. Warranty of 2 years to be provided.
30. There must be 8 years of CMC after end of warranty.
31. It should have Bluetooth 5.0, USB or wi-fi connectivity for data transfer.
32. Service station should be Delhi/NCR based.
33. Training for performing the tests must be provided free of cost.
34. The following items/consumables should be supplied along with equipment:
    1) Calibration syringe, 1000 ml: 1
    2) Calibration syringe, 100 ml: 1
    3) Calibration gas tube: 1
    4) Analyzer measurement set-Adults: 1
    5) Analyzer measurement set-Pediatric: 1
    6) Filters for nasal NO: 300
    7) Nasal catheter, medium: 150
    8) Nasal catheter, small: 150
    9) Nasal catheter, small: 150
    10) Filters for FeNO: 300
    11) Filters for TBFVL/RTC-RVRTC: 100
    12) Masks for TBFVL/RTC-RVRTC: 100
    13) Nose clips: 25
    14) Bacterial filters:300
    15) Spirettes: 300
    16) Connecting gas hose: 2
35. The cost of following consumables to be fixed for next 10 years:
    1) Analyzer measurement set-Adults

2) Analyzer measurement set-Pediatric
3) Filters for nasal NO
4) Nasal catheter, medium
5) Nasal catheter, small
6) Nasal catheter, small
7) Filters for FeNO
8) Filters for TBFVL/RTC-RVRTC
9) Masks for TBFVL/RTC-RVRTC
10) Nose clips
11) Bacterial filters
12) Spirettes
13) Connecting gas hose
14) Any other consumables as specified by the supplier