Evaluation of Compliance with End-Tidal Oxygen (ETO_2) Monitoring During General Anesthesia

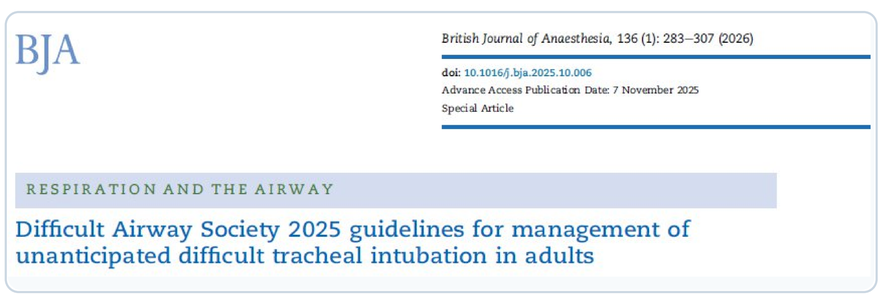
Saad Ur Rehman[1], Sameen Ejaz[1], Ayesha Mehmood[1], Zara Saleem[1]

[1]Anesthesia, Shaukat Khanum Memorial Cancer Hospital and Research Center, Lahore, Pakistan.

BACKGROUND

- Pre-oxygenation before induction de-nitrogenates the functional residual capacity (FRC) and creates an intrapulmonary oxygen reservoir.
- Adequacy of preoxygenation can be MEASURED and hence should not be assumed
- End-tidal oxygen (ETO_2) is a measure of efficacy of pre-oxygenation when using a face mask.

WHAT DO THE GUIDELINES SAY?


BJA

British Journal of Anaesthesia, 136 (1): 283–307 (2026)

doi: 10.1016/j.bja.2025.10.006

Advance Access Publication Date: 7 November 2025

Special Article

RESPIRATION AND THE AIRWAY

Difficult Airway Society 2025 guidelines for management of unanticipated difficult tracheal intubation in adults

- In addition to minimum monitoring (pulse oximetry, noninvasive blood pressure, electrocardiography, and temperature), **inspired and expired oxygen monitoring** and waveform capnography is also recommended.
- During pre-oxygenation, two objectives should be achieved:
  1. assessment of efficacy of pre oxygenation by targeting an end-tidal oxygen fraction
  2. confirmation that waveform capnography is working and correctly interpretable.

OBJECTIVE:

To evaluate compliance with recommended ETO_2 monitoring during pre-oxygenation before tracheal intubation in patients receiving general anesthesia.

STANDARD:

DAS 2025: ETO_2 should be monitored during pre-oxygenation and a value ≥0.9 achieved before intubation.

METHODS

Design: Prospective clinical audit, approved by the Clinical Audit Committee

Setting: 9 operating rooms, SKMCH & RC, Lahore

Population: Patients undergoing general anesthesia with tracheal intubation

Following parameters were audited:

1. Confirmation of the presence and functional readiness of the ETO_2 / gas-analyzer module on the anesthesia workstation in every operating room
2. Determination of the proportion of cases in which ETO_2 was actively monitored before proceeding to tracheal intubation.
3. Determination of the proportion of cases in which the target ETO_2 ≥0.9 was achieved.

"Every extra minute of safe apnea time provides crucial time for a second look, a change of blade, or a rescue plan!"

RESULTS

9 / 9

All Operating rooms had a present and fully functional ETO_2 module

1 / 27

3.7% compliance

Cases in which ETO_2 was monitored during pre-oxygenation

1 / 27

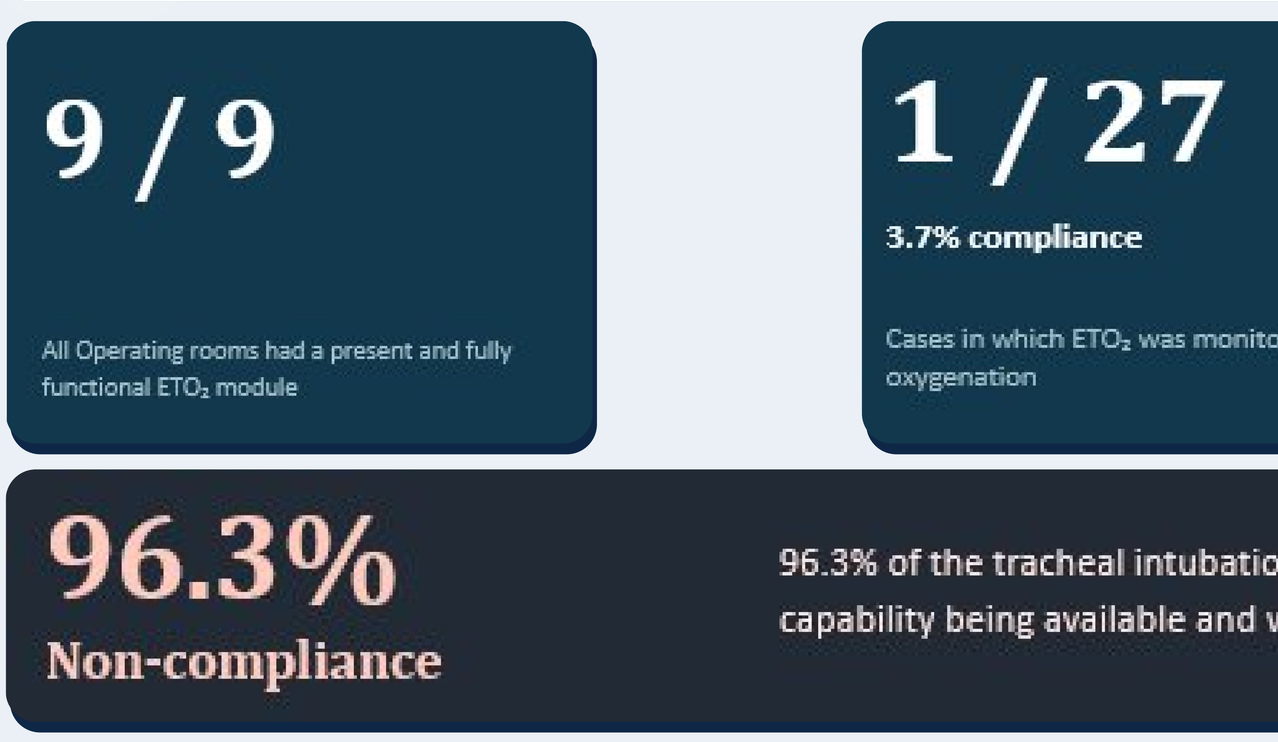
3.7% compliance

Cases in which the target ETO_2 ≥0.9 was achieved

96.3%

Non-compliance

96.3% of the tracheal intubations proceeded without monitoring of the ETO2 despite the monitoring capability being available and working in every single operating room.



RECOMMENDATIONS

1.. Education & training:

Departmental teaching session on the importance of adequate pre-oxygenation and the ETO_2 ≥0.9 target according to the recent guidelines

2. Documentation:

An ETO_2-at-induction field should be added to the intraoperative monitoring sheet

3. Re audit

SHAUKAT KHANUM MEMORIAL
CANCER HOSPITAL & RESEARCH CENTRE

7-A Block R III, Johar Town, Lahore, Pakistan

www.shaukatkhanum.org.pk