

# **Tracheal Sound Monitoring in Dental Treatments with Sedation: An Expert Opinion**

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## **Abstract**

Clinical guidelines recommend using tracheal auscultation to monitor ventilation. Conventional auscultation has limitations. A modern real-time tracheal sound monitor can overcome these limitations and provide more powerful functions, including spectrogram display, continuous monitoring, automated respiratory sound analysis, abnormal event alarm, sound amplification, and adaptive noise cancelling.

During several dental procedures under different sedative routes, many respiratory adverse events could result in respiratory depression. The tracheal sound monitor allows the healthcare providers to know the dynamic change in time-frequency patterns and the sound quality before and after the above events happened. The opinion about the tracheal sound monitor is listed below:

- (1) It enables the healthcare providers to predict which factor was going to cause hypoventilation and take precise preventive measures. In the past, the team must stop the procedure to check the airway and remove all possible factors individually and see if the SpO<sub>2</sub> recovered. Now with real-time tracheal sound monitor, the healthcare team can improve the airway management during the procedures. The healthcare team can precisely and quickly remove the factor that causes oxygen desaturation and return to next dental procedure.
- (2) It helps differentiate laryngospasm from upper airway obstruction. Therefore, with a laryngospasm event, the healthcare providers can clearly know a jaw-thrust maneuver is needed instead of chin lift.
- (3) The healthcare team can know how much saliva and fluid accumulates in the

pharyngolaryngeal region.

- (4) It helps detect apnea earlier than the capnography.
- (5) It helps control the depth of anesthesia in an optimal range.

In summary, a modern real-time tracheal sound monitor can complement capnography to provide reliable respiratory monitoring. We suggest that every sedation procedures should be monitored with modern tracheal sound monitor in an intensive care unit, procedure sedation, or operating room.



(a)



(b)

**Figure 1. (a) partial upper airway obstruction become total upper airway obstruction, and (b) total upper airway obstruction was mitigated after airway maneuvers.** Red arrows indicates the inhalation pattern with continuous adventitious sound pattern in it. Blue arrows indicate that the patient made inhalation attempts but failed to take a full inhalation. Green lines indicate the updating line. The video clip can be seen at <https://www.youtube.com/watch?v=VqSYQmGgw8c>.