Confirmation of Endotracheal Tube Placement

Designation of Condition: Confirmation of correct ET tube placement is critical. Traditional methods of confirming correct tube placement include: visualizing the ETT passing through the vocal cords, auscultation of clear and equal bilateral breath sounds, absence of air sounds over the epigastrium, observation of symmetric chest rise and fall, visualizing condensation (misting) in the tube, and monitoring of SpO2. Unfortunately, all have been shown to have limitations and are subject to failure, resulting in undetected misplacement or displacement of ET tubes into the esophagus or hypopharynx. Reliable confirmation of ET tube placement is best achieved by combining all appropriate traditional methods with one or more of the methods discussed below. Application of an end-tidal CO2 capnography detector device is **MANDATORY** for all intubated patients.

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Quantitative Capnography: (ALL ENDOTRACHEAL TUBES WILL BE CONFIRMED BY THIS MEASUREMENT)

Indications: Initial confirmation and continuous assessment of correct ETT placement in patients with or without pulses

- Tracheal placement: Tracheal ETT placement creates a normal rectangular waveform or an expected variant of the normal waveform.
- Esophageal placement: Esophageal ETT placement results in a flat-line capnographic display. Esophageal placement cannot create a normal/normal variant capnographic waveform, even if CO2 is present in the stomach and reflected by a measured capnometric value.

Colorimetric EtCO2 Detector Device:

Indications: Initial and continuous confirmation of ETT placement in patients with or without pulses

Colorimetric EtCO2 detectors are extremely accurate when used on patients with peripheral circulation sufficient to produce palpable pulses.

- Yellow (patients with or without pulses): Color change from purple to yellow indicates presence of exhaled CO2 and tracheal intubation
- Purple (patients with pulses): No change of color to yellow indicates esophageal intubation with a lack of exhaled CO2
- Purple (patients without pulses): ET tube placement indeterminate; in such cases, repeat laryngoscopy and/or use of an esophageal detector device
- Consider transition to quantitative capnography for continued monitoring when available

Limitations of quantitative capnography:

- Cardiac arrest/severely low blood flow states: The lowest level of CO2 that can create a reliable waveform and capnometric value is unknown. In the setting of cardiac arrest, use all available advanced airway assessment techniques and adjuncts as appropriate to confirm proper ETT placement.

Toomey Syringe / Esophageal Detector Device

Indication: Initial or ongoing assessment of ET tube placement when EtCO2 detection results are indeterminate (patients without pulses)

Method: Attach Toomey syringe (or other EDD) to ET tube adapter and attempt to rapidly withdraw a large volume of air. If able to rapidly withdraw at least 30ml of air, the ETT is almost certainly placed in the trachea (unless the tip of the ETT is very shallow and in the hypopharynx). If unable to easily and rapidly withdraw 30ml of free air, the ETT should be considered in the esophagus.

*****KEY POINT*****

If a service does not have quantitative capnography, then direct laryngoscopy is strictly prohibited