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The Ohio Board of Emergency Medical Services (“EMS Board”) issues the following statement:

## Regarding the Use of Capnography for Endotracheally Intubated Patients in the Prehospital Setting April 2011

*This statement is an attempt to provide general information about the above issue facing EMS providers. It should not be treated as legal advice or medical direction. For direct advice regarding a particular scenario, please consult with your medical director and legal counsel. Although the following statement represents the EMS Board’s general position on the above issue, this statement in no way precludes the EMS Board from taking disciplinary action in a particular case if necessary. Any potential complaints brought before the EMS Board will be decided on a case by case basis.*

### **Introduction:**

The Ohio Department of Public Safety, Division of Emergency Medical Services, has developed a defined scope of practice for EMS professionals. The scope of practice for each level of emergency medical technicians (EMTs) is established in Ohio Administrative Code Chapters 4765-15, 4765-16, and 4765-17. An outline of the Ohio EMS scope of practice is available in matrix form and is posted on the Ohio Department of Public Safety, Division of EMS website as a reference for public access. This scope of practice addresses all levels of EMTs and has been approved by the EMS Board. Updates to the scope of practice are made as necessary and must be approved by the EMS Board.

EMS professionals routinely assess the respiratory status and stability of the airway regardless of the patient’s chief complaint. From time to time, EMTs provide airway management interventions to support patients with airway instability, impending or existing compromised respiratory status, or patients in respiratory or cardiac arrest. The intent of this position paper is to address the benefits of the utilization of additional adjuncts, specifically capnography, to assess endotracheally intubated patients by EMTs in the prehospital setting.

### **Discussion:**

In the past, the primary avenues to assess the correct placement of an endotracheal tube following intubation were direct visualization of the trachea, auscultation, of the chest and the utilization of pulse oximetry. Despite the availability of these resources, inadequate airway management leading to hypoxia, including unrecognized misplaced or displaced endotracheal tubes, remains one of the top five grounds for successful malpractice litigation against EMS professionals and EMS agencies.

The qualitative colorimetric measurement of end-tidal carbon dioxide (ETCO<sub>2</sub>), the level of carbon dioxide (CO<sub>2</sub>) released at the end of expiration, by a pH-sensitive paper placed at the end of an endotracheal tube has been used for quite some time as an adjunct for confirmation of correct endotracheal tube placement. Capnography, the ongoing measurement and monitoring of the concentration or partial pressure of CO<sub>2</sub> (P<sub>ETCO2</sub>)

#### **Mission Statement**

*“To promote quality and professionalism in the hiring, training, education, and delivery of fire and Emergency Medical Services with equal consideration given to all diverse populations and constituents.”*

in respiratory gases, has been used as a patient assessment tool and airway management adjunct in the field of anesthesiology for many years. Recent developments in technology have introduced lightweight portable devices that are capable of quantitative capnography via colorimetric or waveform methods. Quantitative capnography is an adjunct for the EMT to confirm correct endotracheal tube placement, continually assess the patient for hypoventilation or endotracheal tube displacement, and potentially create a capnograph, a dynamic written record of the patient's  $P_{ETCO_2}$ , during the period of time when prehospital care has been delivered.

Unlike pulse oximetry alone, the advent of capnography devices that non-invasively monitor  $P_{ETCO_2}$  has expanded the ability of all health care providers, particularly those in the prehospital setting, to more rapidly detect airway compromise due to hypoventilation or improperly placed or displaced endotracheal tubes. The recent American Heart Association guidelines have highlighted the recommendation that continuous quantitative waveform capnography should be used to monitor the effectiveness of cardiopulmonary resuscitation (CPR) and the early detection of the return of spontaneous circulation (ROSC) in the patient who has sustained a cardiopulmonary arrest.

**Conclusion:**

The confirmation, ongoing assessment, and documentation of the security of the established airway in the endotracheally intubated patient are imperative. The quality of cardiopulmonary resuscitation and the detection of the return of spontaneous circulation in the patient who has sustained a cardiopulmonary arrest are equally important. Therefore, quantitative colorimetric or waveform capnography is recommended for inclusion in prehospital protocols by EMS medical directors and implementation by EMTs providing emergency care, within the parameters of the Ohio EMS scope of practice, to endotracheally intubated patients.