

# EMMA FAQ's and Features

## Where is the EMMA name coming from?

EMMA is an abbreviation of Emergency Mainstream Analyzer.

## What is EMMA?

EMMA is an Emergency Capnometer for proof-of-intubation and short term CO<sub>2</sub> monitoring of adults, children and infants in emergency transport, emergency care and intensive care.

## What does EMMA measure?

It measures end-tidal CO<sub>2</sub> and respiratory rate.

## Is EMMA CE marked?

Yes, EMMA is CE marked.

## How accurate is EMMA?

The accuracy of all measurement values fully complies with Respiratory Gas Monitor ISO 21647 standard and requirements.

## How durable is EMMA?

EMMA has a rugged, shock-proof and water resistant design to provide the user with a reliable monitor for any emergency situation. EMMA has also been designed in accordance with prEN 1789 standard for Road Ambulances.

## How do I connect EMMA to a patient?

EMMA can be connected to an endotracheal tube, laryngeal mask or facial mask.

## Can EMMA be used on infants?

The EMMA Airway Adapter has a dead space of 7 cc allowing the use on patients weighting approximately more than 3 kilos. The EMMA Infant Airway Adapter (coming soon) has a dead space of 1 cc allowing the use of EMMA even for very small patients.

## Can EMMA be used with rechargeable batteries?

It is not recommended to use EMMA with rechargeable batteries since rechargeable batteries have lower energy content.

## How often do I need to change the batteries?

The life time of the batteries is approximately 8 hours of normal use.

## Can the Airway Adapter be sterilized?

No. EMMA Airway Adapters are designed for single patient use and can not be sterilized.

## Can the Airway Adapter be kept inline continuously?

Yes, but should be monitored for moisture condensation and contamination.

## What is EMMA's start-up time?

EMMA has no warm up time and has full accuracy as soon as switched on.

## How does EMMA measure ETCO<sub>2</sub>?

The measurement of ETCO<sub>2</sub> is done with an infrared micro bench. A microprocessor continuously calculates ETCO<sub>2</sub> concentrations from the infrared light absorption measurement done through the windows of the Airway Adapter.

## How does the battery indicator work?

A green light indicator is lit when the battery status is OK. The green indicator will start blinking continuously when there is less than 30 minutes left of use.

## How is ETCO<sub>2</sub> and breathing visualized?

Both ETCO<sub>2</sub> and respiratory rate are visualized on LED numeric displays. A large, easy to read, 14 segment bar graph gives immediate visual feedback for ETCO<sub>2</sub> concentrations, breathing activity or alarm situations. EMMA is available with a comprehensive alarm system with both visual and audible alarms for apnea, adapter clogging and high and low end-tidal values.

## How quickly does EMMA display ETCO<sub>2</sub> and respiratory rate values?

The ETCO<sub>2</sub> values are displayed after one breath and updated every breath. Respiratory rate will be displayed after two breaths and updated every breath.

## What are the numbers displayed at start up?

The numbers displayed at start up specify the unit's software version.

## How do I switch off EMMA?

EMMA will automatically switch off after 15 seconds if the Airway Adapter is removed.

If there is no breath detected EMMA will switch off automatically after 2 minutes. EMMA Monitor will only switch off after 2 minutes if the Alarm Silence has been activated and no breath has been detected for 2 minutes.

If EMMA Monitor is turned on and never used on a patient (no breathing detected) it will automatically switch off after 2 minutes.

## In which environments can EMMA operate?

EMMA is recommended to be operated at temperatures within the interval of -5 to 40 °C (23 to 104 °F). The operating humidity should be in the interval of 10 - 95%, non-condensing

EMMA can be stored in temperatures between -30 to 70 °C (-22 to 158 °F).

## What alarm functions is EMMA equipped with?

The EMMA Analyzer is equipped with visual alarm indicators. The EMMA Monitor is equipped with both visual and audible alarms.

## What are the default alarm settings?

The default settings are 50 mmHg (7,0 kPa) for high ETCO<sub>2</sub> and the low ETCO<sub>2</sub> is set to OFF.

## Can the alarms be adjusted?

Yes the HIGH and LOW ETCO<sub>2</sub> alarm limits can be adjusted. It is also possible to switch off the limits if necessary. Carefully follow the instructions in the EMMA User's Manual.

## How do I silence an alarm?

An alarm can be silenced by pressing the Alarm Silence button. The top segment of the bar graph will change color to red.

## How long is an alarm silenced for?

The alarm is silenced for 2 minutes.

## What will happen if the alarm is silenced and no breath is detected within the 2 minutes period of time?

If no breath is detected within the 2 minutes period of time the unit will shut off. If breathing re-appears within the 2 minutes period of time the unit will reactivate the alarm system and measure normally.

## How loud is EMMA's alarm?

The audible alarm level of an EMMA Monitor is more than 60 db.

## What is the audible alarm sequence on an EMMA Monitor?

When an alarm is detected the alarm status indicator (yellow led on top of the bar graph and the indicators on the corresponding display) will start blinking and one beep tone after 20 seconds will be generated. After 20 additional seconds there will be two beeps and the indicators will continue blinking. After 20 more seconds there will be three tones and the indicators will continue blinking.

The indicators will keep blinking and the three tone beeps will be repeated with 20 second intervals until the Airway Adapter is detached from the device or after 2 minutes if the alarm silence key has been pressed.

## Is EMMA certified for use in helicopter?

The requirements for Helicopters are local and specific for each helicopter. Consult with MEDACX prior to testing it.

## Can EMMA be used in Home Care?

Yes, EMMA can be used to verify the settings of a ventilator at home.

## What are the advantages vs. traditional sidestream monitoring?

Unsurpassed mobility compared to EMMA. Cables and tubing can represent a hazard in an emergency situation.

## How often do I need to calibrate EMMA?

EMMA does not require any routine calibration. Gas readings should be verified with a reference instrument at regular intervals.

## How do I zero calibrate EMMA?

To perform a zero calibration, carefully follow the instructions in EMMA User's Manual.

## How often do I need to zero calibrate EMMA?

A zero reference calibration of the measurement should be performed whenever an offset in gas readings is discovered. For example if EMMA would display a non-zero ETCO<sub>2</sub> value when switched on.

## How do I clean EMMA?

EMMA can be cleaned using a cloth moistened with isopropyl alcohol.

# EMMA FAQ's and Features

---

## EMS (Emergency Medical Service)

### Why Capnography?

#### Ventilation

- EtCO<sub>2</sub> measures ventilation
- SpO<sub>2</sub> measures oxygenation
- The vital measurement of respiratory rate
- Provides an immediate picture of the patient condition

#### Airway management

- Ongoing assessments (provides assurance that the tube is maintained in the trachea)
- Safety during transports (extubation, ventilation, disconnects, etc)

#### Resuscitation Monitoring

- Verification/confirmation of tracheal intubation
- Assess efficacy of CPR – early indicator of return of spontaneous circulation (ROSC)
- Recommended AHA guideline

#### Hypoventilation due to sedation, analgesia or overdose

### EMMA Features

- Easy to use
- Quantitative
- Mainstream device
- Pocket sized, lightweight (60 grams)
- Battery powered – 2 AAA
- Alarms & indicators
- Infant through adult population
- No calibration required

### FAQ - EMS

#### **Why use EMMA when we have pulse oximetry?**

Pulse oximetry measures oxygenation and alerts clinicians to hypoxic events. Capnography measures ventilation and will alert the caregiver to ventilatory events long before a pulse oximeter.

#### **Can I use nebulize medications while EMMA is being used?**

It is not recommended to use EMMA with nebulized medications as the particle sizes may affect the light transmission of the airway adapter windows

# EMMA FAQ's and Features

---

## Features for NICU/PICU (Neonatal and Pediatric Intensive Care Unit)

### Why Capnography?

#### Ventilation

- EtCO<sub>2</sub> measures ventilation
- SpO<sub>2</sub> measures oxygenation
- Provides immediate picture of the patient condition
- The vital measurement of respiratory rate

#### Airway management

- Ongoing assessments (provides assurance that the ETT is maintained in the trachea)
- Safety during transports (extubation, ventilation, disconnects, etc)

#### Ventilator weaning

#### Assessment of manual or mechanical ventilation efficacy

#### Evaluation of the Respiratory Compromised Intubated Patient

- Need for treatment, suctioning and medications can be continuously assessed
- Assessment post-treatment
- Assessment of alveolar emptying

#### Resuscitation Monitoring

- Verification/confirmation of tracheal intubation
- Assess efficacy of CPR – early indicator of return of spontaneous circulation (ROSC)
- Informs the clinician to effectiveness of cardiac compression
- Recommended AHA guideline

#### Reduction in the number of ABG draws

## EMMA Features

- Easy to use
- Quantitative
- Mainstream device
- Pocket sized, lightweight (60 grams)
- Battery powered – 2 AAA
- Alarms & indicators
- Infant through adult population
- No calibration required

## NICU/PICU FAQ

### What is ADCO<sub>2</sub> and how can it be used as a patient assessment tool?

- Arterial to Alveolar Difference in CO<sub>2</sub> is normally 0-5 mmHg (PCO<sub>2</sub> is usually 0-5 mmHg higher than the EtCO<sub>2</sub>)
- When perfusion to the lungs is greatly decreased, the difference increases (PCO<sub>2</sub> is now more than 0-5 mmHg higher than EtCO<sub>2</sub>).
- The ADCO<sub>2</sub> can be utilized as a tool to monitor the efficacy of treatment and care modalities. As the ADCO<sub>2</sub> decreases, the patients' cardiopulmonary status is improving

### Is ETCO<sub>2</sub> with EMMA a better choice than TcCO<sub>2</sub>?

- Transcutaneous monitoring displays a reflection of an arterial CO<sub>2</sub> (PCO<sub>2</sub>) which is a different physiologic parameter than the EtCO<sub>2</sub>. Most newborns and some neonates have a normal ADCO (and so the EtCO<sub>2</sub> and TcCO<sub>2</sub> are approximately the same).
- The TcCO<sub>2</sub> does not provide airway vigilance or alarms alerting the clinician to apnea and disconnects
- ETCO<sub>2</sub> and TcCO<sub>2</sub> can be used together as a tool to assess the widening or narrowing of a ADCO<sub>2</sub> in response to changes in patient care modalities
- TcCO<sub>2</sub> sensors can cause skin damage or burns to the patient and must be moved and adjusted frequently

### How can ABG draws be reduced?

- When an infant or neonate has a normal ADCO<sub>2</sub>, the EtCO<sub>2</sub> value approximates the PCO<sub>2</sub>. If the ABG's were utilized for weaning purposes or for daily ABG assessment, then the number of draws can be greatly reduced by using a protocol that incorporates EtCO<sub>2</sub> and SpO<sub>2</sub>.
-

# EMMA FAQ's and Features

---

## Critical Care / ICU - Intensive Care Unit

### Why Capnography?

#### Ventilation

- EtCO<sub>2</sub> measures ventilation
- SpO<sub>2</sub> measures oxygenation
- The vital measurement of respiratory rate
- Provides immediate picture of the patient condition

#### Airway management

- Ongoing assessments (provides assurance that the ETT is maintained in the trachea)
- Safety during transports (extubation, ventilation, disconnects, etc)
- Basic monitoring

#### Ventilator weaning

#### Assessment of manual or mechanical ventilation efficacy

#### Evaluation of the Respiratory Compromised Intubated Patient

- Need for treatment, suctioning and medications can be continuously assessed
- Assessment post-treatment

#### Resuscitation Monitoring

- Verification/confirmation of tracheal intubation
- Assess efficacy of CPR – early indicator of return of spontaneous circulation (ROSC)
- Informs the clinician to effectiveness of cardiac compression
- Recommended AHA guideline

#### Hypoventilation due to sedation, analgesia or overdose

#### Reduce the number of ABG draws

### EMMA Features

- Easy to use
- Quantitative
- Mainstream device
- Pocket sized, lightweight (60 grams)
- Battery powered – 2 AAA
- Alarms & indicators
- Infant through adult population
- No calibration required

### ICU - FAQ

#### **What is ADCO<sub>2</sub> and how can it be used as a patient assessment tool?**

- Arterial to Alveolar Difference in CO<sub>2</sub> is normally 0-5mm Hg (PCO<sub>2</sub> is usually 0-5mm Hg higher than the EtCO<sub>2</sub>)
- When perfusion to the lungs is greatly decreased, the difference increases (PCO<sub>2</sub> is now more than 0-5 mmHg higher than EtCO<sub>2</sub>).
- The ADCO<sub>2</sub> can be utilized as a tool to monitor the efficacy of treatment and care modalities. As the ADCO<sub>2</sub> decreases, the patients' cardiopulmonary status is improving

#### **Can I use nebulize medications while EMMA is being used?**

It is not recommended to use EMMA with nebulized medications as the particle sizes may affect the light transmission of the airway adapter windows

#### **Can in-line suction be used with EMMA?**

Yes, in the circumstance of in-line suction devices, place the airway adapter between the ventilation source (Y piece) and the ventilation adapter of the closed suction system. Never suction through the airway adapter.

#### **How can ABG draws be reduced?**

- When an infant or neonate has a normal ADCO<sub>2</sub>, the EtCO<sub>2</sub> value approximates the PCO<sub>2</sub>. If the ABG's were utilized for weaning purposes or for daily ABG assessment, then the number of draws can be greatly reduced by using a protocol that incorporates EtCO<sub>2</sub> and SpO<sub>2</sub>.
-

# EMMA FAQ's and Features

---

## PACU - Post Anesthesia Care Unit

### Why Capnography?

#### Ventilation

- EtCO<sub>2</sub> measures ventilation
- SpO<sub>2</sub> measures oxygenation
- The vital measurement of respiratory rate
- Provides immediate picture of the patient condition

#### Airway management

- Ongoing assessments (provides assurance that the ETT is maintained in the trachea)
- Safety during transports (extubation, ventilation, disconnects, etc)

#### Ventilator weaning

#### Assessment of manual or mechanical ventilation efficacy

#### Evaluation of the Respiratory Compromised Intubated Patient

- Need for treatment, suctioning and medications can be continuously assessed
- Assessment post-treatment

#### Resuscitation Monitoring

- Verification/confirmation of tracheal intubation
- Assess efficacy of CPR – early indicator of return of spontaneous circulation (ROSC)
- Informs the clinician to effectiveness of cardiac compression
- Recommended AHA guideline

#### Hypoventilation due to sedation, analgesia or overdose

### EMMA Features

- Easy to use
- Quantitative
- Mainstream device
- Pocket sized, lightweight (60 grams)
- Battery powered – 2 AAA
- Alarms & indicators
- Infant through adult population
- No calibration required

### PACU - FAQ

#### **What is ADCO<sub>2</sub> and how can it be used as a patient assessment tool?**

- Arterial to Alveolar Difference in CO<sub>2</sub> is normally 0-5mm Hg (PCO<sub>2</sub> is usually 0-5mm Hg higher than the EtCO<sub>2</sub>)
- When perfusion to the lungs is greatly decreased the difference increases (PCO<sub>2</sub> is now more than 0-5 mmHg higher than EtCO<sub>2</sub>).
- The ADCO<sub>2</sub> can be utilized as a tool to monitor the efficacy of treatment and care modalities. As the ADCO<sub>2</sub> decreases, the patients' cardiopulmonary status is improving

#### **Can the Airway Adapter be kept inline continuously?**

Yes, but should be monitored for moisture condensation and contamination.

#### **Why use EMMA when we have pulse oximetry?**

Pulse oximetry measures oxygenation and alerts clinicians to hypoxic events. Capnography measures ventilation and will alert the caregiver to ventilatory events long before a pulse oximeter.

---