AAGBI SAFETY STATEMENT
Capnography Outside The Operating Theatre

A statement from the Association of Anaesthetists of Great Britain & Ireland (AAGBI)

In 2007, the AAGBI published the fourth edition of its guidance document “Recommendations for standards of monitoring during anaesthesia and recovery” [1]. This document noted that continuous capnography must be used during induction and maintenance of general anaesthesia. It also recommended that continuous expired carbon dioxide monitoring be used for patients whose tracheas are intubated and who are undergoing transfer from one clinical area to another.

Because of the recognised safety advantages of using capnography in these situations, it is difficult to justify not using it when caring for patients in similar circumstances throughout the hospital. Following Serious Untoward Incidents arising from patients being treated outside the operating theatre in Intensive Care Units, High Dependency Units and Recovery Rooms, the AAGBI has decided to update its guidance on the use of capnography. The AAGBI now makes the following recommendation:

Continuous capnography should be used in the following patients, regardless of location within the hospital:

Those whose tracheas are intubated
Those whose airways are being maintained with supraglottic or other similar airway devices
Capnographs should be available for use wherever it is possible that a patient’s trachea will be intubated, such as anaesthetic rooms, operating theatres, recovery rooms, other treatment rooms in which general anaesthesia is given, intensive care units, high dependency units, and accident and emergency departments. It is also recommended that a capnograph be immediately available during the treatment of cardiac arrests in hospital.

To enhance patient safety, the AAGBI recommends that gas monitoring is normally set up directly from the breathing circuit just proximal to the patient breathing filter so that safer breathing filters without monitoring ports can be used routinely. This will decrease the number of breathing circuit connections and reconnections, and will minimise the potential for disconnections, leaks and the need for extra plastic caps, the use of which has been associated with the obstruction of airway equipment.

It is also recommended that continuous capnography should be considered during sedation

For all patients receiving deep sedation.
For all patients receiving moderate sedation whose ventilation cannot be directly observed.
Detection of expired carbon dioxide requires the following four processes to be intact:

1) metabolism to generate carbon dioxide
2) adequate circulation to deliver carbon dioxide to the lungs
3) ventilation of the lungs through a patent airway to expel carbon dioxide
4) a functioning carbon dioxide analyzer to quantify the gas

Failure at any of the steps of this pathway can lead to a failure to detect expired carbon dioxide. Because the first three processes are indicators of patient well-being, detection of expired carbon dioxide has become a standard of safety monitoring. Also expired carbon dioxide monitoring has become a standard for assessing correct endotracheal tube placement.

**Minimal sedation** – a minimally depressed level of consciousness, produced by a pharmacological method, that retains the patient’s ability to independently and continuously maintain an airway and respond normally to tactile stimulation and verbal command.

**Moderate sedation** – a drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate.

**Deep sedation** – a drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully following repeated or painful stimulation. The ability to independently maintain ventilatory function may be impaired.