

Capnography is used in various clinical settings to alert clinicians of changes in the patient's ventilations status. Listed below are various recommendations and standards related to monitoring exhaled CO₂.

ORGANIZATION	STATEMENT	YEAR
Canadian Pediatric Society (CPS)	Position statement neuro protection from acute brain injury in preterm infants: Monitoring PCO ₂ via blood gases or transcutaneous or end-tidal CO ₂ is recommended for infants born at ≤32 weeks GA, with a goal of achieving PCO ₂ levels of 45 mmHg to 55 mmHg in the first 72 hours post-delivery.	2019
American Association of Nurse Anesthetist (ANA)	Standards for nurse anesthesia practice: Continuously monitor ventilation by clinical observation and confirmation of continuous expired carbon dioxide during moderate sedation, deep sedation or general anesthesia. Verify intubation of the trachea or placement of other artificial airway device by auscultation, chest excursion, and confirmation of expired carbon dioxide. Use ventilatory monitors as indicated.	2019
American Academy of Pediatrics (AAP) & American Academy of Pediatric Dentistry (AADP)	Guidelines for monitoring and management of pediatric patients before, during and after sedation. Capnography should be used for all deeply sedated children. Continuous monitoring of ventilation (Capnography preferred) during procedure and values documented in patient chart.	2019
Intensive Care Society (ICS)- UK	Guideline for transfer of the critically ill adult. Capnography / end tidal CO ₂ monitoring is mandatory in all intubated ventilated patients. Capnography for monitoring airway patency and adequacy of ventilation.	2019
American Society for Anesthesia (ASA)	Practice guidelines for moderate sedation and analgesia: Patients given sedatives or analgesics in unmonitored settings may be at increased risk of these complications. Patient monitoring includes "2) monitoring patient ventilation and oxygenation, including ventilatory function, by observation of qualitative clinical signs, capnography, and pulse oximetry"	2018
American Society for Gastrointestinal Endoscopy (ASGE)	Guidelines for sedation and anesthesia in GI endoscopy. Recommend capnography monitoring for patients undergoing endoscopy targeting deep sedation	2018
American Association for Accreditation of Ambulatory Surgery Facilities (AAAASF)	Office-based practices are required to provide continual monitoring of end tidal CO ₂ for moderate sedation, deep sedation and general anesthesia in the office-based setting. Continuous EtCO ₂ monitoring in use from the time of endotracheal tube/laryngeal mask placement until extubation/removal. Alarms set and audible.	2018
Joint Commission (JCAHO)	Requirement: R3 Report on pain management specifies prescribing and monitoring practices- Hospitals required to minimize the risks associated with treatment. Monitoring for respiratory depression is essential, as it's reported to be the most dangerous adverse effect of opioid analgesics.	2018
Joint Commission (JCAHO)	Requirement: PC.03.01.05, EP 1 During operative or other high risk procedures, including those that require the administration of moderate or deep sedation or anesthesia, the patient's oxygenation, ventilation, and circulation are monitored continuously.	2018
Association for Radiologic and Imaging Nursing. (ARIN)	Clinical practice guideline: Capnography: should be routinely used for all patients receiving moderate sedation/analgesia during procedures in the imaging environment. Capnography should be used at all times, regardless of whether sedation is administered by an anesthesia provider or a registered nurse credentialed to administer moderate sedation/analgesia medications.	2018
Emergency Care Research Institute (ECRI)	Patient safety recommendation: Continuous monitoring of the adequacy of ventilation for patients receiving parenteral and neuraxial opioids in medical-surgical and general care areas, and patients receiving opioids in hospitals and ambulatory surgery or endoscopy facilities during procedural sedation and while in post-anesthesia care units. These patients can be monitored either with capnography or by assessing minute ventilation.	2018
American Heart Association (AHA)	PALS guideline: Waveform capnography or capnometry to confirm and monitor ET tube placement – no change from 2015 guidelines	2018

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American Heart Association (AHA)	ACLS guideline: Waveform capnography or capnometry to confirm and monitor ET tube placement. If PetCO ₂ < 10 mm Hg attempt to improve CPR quality. – no change for 2015 guidelines	2018
European Board of Anesthesiology (EBA)	Safety recommendations for minimal monitoring during anaesthesia and recovery. Capnography is an essential part of routine monitoring during anaesthesia. During recovery and transport, if patient has an artificial airway continuous capnography should be used.	2018
Canadian Anesthesia Society (CAS)	Guideline to the practice of anesthesia; Use capnography is mandatory for monitoring all patients receiving anesthesia or intravenous sedation. Monitors must be in continuous use throughout the administration of all anesthetics.	2018
European Society of Anesthesiology (ESA) & EBA	Guidelines for procedural sedation and analgesia in adults. Use continuous capnography to monitor all patients undergoing moderate or deep sedation.	2017
Australian and New Zealand College of Anesthetists (ANZCA)	Guideline on monitoring during anaesthesia. Ventilation must be monitored continuously, monitoring of inhaled and exhaled CO ₂ .	2017
Hospital Quality Institute (HQI)	Safety recommendation: Monitor patients at high risk for respiratory depression, who may be on PCA (with or without a basal dose), PCEA, epidural or fentanyl patch.	2017
Australian and New Zealand Committee on Resuscitation (ANZCOR)	ARC guideline principles of in-hospital resuscitation. Quantitative capnography must be used routinely to confirm artificial airway placement and continued during CPR to assess the quality of CPR, (ANZCOR Guideline 11.6).	2017
New York State Department of Health (NYS DOH)	Regulation: Office-based surgery practices are required to provide continuous EtCO ₂ monitoring for patients receiving moderate sedation, deep sedation, and general anesthesia	2017
Physician-Patient Alliance for Health & Safety (PPAHS)	Position statement: Recommends the inclusion of capnography monitors alongside other monitoring methodologies for patients receiving opioids.	2017
American College of Emergency Physicians (ACEP)	Policy statement: Monitor end tidal carbon dioxide to evaluate and confirm endotracheal tube placement.	2016
Tactical Combat Casualty Care (TCCC)	TCCC Guidelines: Capnography should also be used in the TACEVAC phase of care	2017
Scandinavian Society of Anesthesiology and Intensive Care (SSAI)	Clinical practice guideline on pre-hospital airway management.	2016
All India Difficult Airway Association (AIDAA)	Guideline for management of unanticipated difficult tracheal intubation in adults: Capnography a gold standard for confirming proper placement of ET tube.	2016
American Pain Society (APS)	Guidelines on the management of postoperative pain: Appropriate monitoring of respiratory status in patients who receive systemic opioids for postoperative analgesia. Capnography might be more sensitive than pulse oximetry in identifying respiratory depression.	2016
American Society for Anesthesia (ASA)	Practice Guidelines for the prevention, detection, and management of respiratory depression associated with neuraxial opioid administration: Detection of respiratory depression through monitoring for adequacy of ventilation, oxygenation, and level of consciousness. Respiratory depression monitoring includes (1) consideration of techniques to detect respiratory depression and (2) perioperative monitoring for respiratory depression.	2016
Association for Radiologic and Imaging Nursing. (ARIN)	Position statement: Capnography. Endorses the routine use of capnography for all patients who receive moderate sedation/analgesia during procedures in the imaging environment. Capnography should be used at all times, when moderate sedation/analgesia medications are administered.	2016

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United Kingdom National Multidisciplinary Guidelines	Anaesthesia for head and neck surgery guideline: Patients admitted to post-operative care units with tracheal tubes should be monitored with continuous Capnography.	2016
Society of Gastroenterology Nurses and Associates (SGNA)	Sedation guidelines and policies: Capnography monitoring may reduce risks during moderate and deep sedation.	2016
American Dental Association (ADA)	Guideline for the use of sedation and general anesthesia by dentists: Capnography is recommended for all moderate sedation and no intubated deep sedation.	2016
Intensive Care Society (ICS)- UK	Capnography should be continuously monitored in all patients with an artificial airway	2016
Association of Operation Registered Nurses (ARON)	Guideline for care of the patient receiving moderate sedation / analgesia: Use capnography to evaluate ventilation during moderate sedation analgesia procedures"	2015
Association of Anesthetists of Great Britain and Ireland (AAGBI)	Recommendations for standards of monitoring during anaesthesia and recovery: Continuous capnography monitoring for patients with artificial airways and those who are deeply sedated. Capnography monitoring throughout the whole period of anaesthesia from induction to full recovery of consciousness.	2015
Canadian Society of Gastroenterology Nurses and Associates (CSGNA)	Position statement for procedural sedation: Documentation should include responses to sedation, tolerance of procedure, and the monitoring of blood pressure, pulse, ECG monitoring, respirations, oxygen saturation via pulse oximetry, and capnography (gold standard).	2015
College of Physicians of Quebec	Position statement. Monitoring carbon dioxide allows for: · The early identification of complications like excessive sedation, hypoventilation, and apnea · Better control of the sedation level based on the implemented diagnostic and therapeutic intervention	2015
European Society of Anesthesiology (ESA)	Resuscitation Guideline: Capnography is mandatory for tube verification and monitoring ventilation. Updated 2017.	2015
Emergency Nurses Association (ENA)	Clinical practice guideline. Capnography in patients receiving procedural sedation/analgesia in the emergency department for earlier detection of adverse events such as hypoventilation and apnea.	2015
American College of Emergency Physicians (ACEP)	Clinical policy. Procedural sedation and analgesia in the ED. Deep sedation monitoring should emphasize the potential for reduction in ventilation and cardiovascular complications he routine use of capnography monitoring during all procedural sedation and analgesia has been recommended	2014
British Thoracic Society (BTS)	Guideline for respiratory management of children with neuromuscular weakness. Capnography should be used to check NIV effectively.	2013
American Society of Pain Management Nursing (ASPMN)	Guideline for monitoring for opioid-induced sedation and respiratory depression. The use of capnography in the postoperative period can be a useful indicator for respiratory depression in high-risk patients.	2011
Australian and New Zealand College of Anesthetists (ANZCA)	Guidelines on Sedation and/or Analgesia for Diagnostic and Interventional Medical, Dental or Surgical Procedures: According to the clinical status of the patient, other monitors such as ECG or capnography may be required.	2014
Society of Interventional Radiology (SIR)	Position Statement on moderate sedation standards-capnography: In cases of moderate sedation, monitoring CO ₂ capnography should be considered.	2013
American Association of Oral and Maxillofacial Surgeons (AAOMS)	Clinical Practice Guidelines for oral and maxillofacial surgery. Continuous monitoring of ventilation. To evaluate ventilation adequacy during moderate or deep sedation and general anesthesia by continually observing qualitative clinical signs and monitoring for EtCO ₂ .	2012

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American Society for Anesthesia (ASA)	Standards for Basic Anesthetic Monitoring: To ensure adequate ventilation of the patient during all anesthetics. When an endotracheal tube or laryngeal mask is inserted, its correct positioning must be verified by clinical assessment and by identification of carbon dioxide in the expired gas. Continual end-tidal carbon dioxide analysis, in use from the time of endotracheal tube/laryngeal mask placement, until extubation/removal or initiating transfer to a postoperative care location, shall be performed using a quantitative method such as capnography, capnometry or mass spectroscopy.	2011
American Association of Respiratory Care (AARC)	Clinical practice guideline capnometry for mechanical ventilation: Recommends capnography/capnometry for verification of artificial airway placement; assessment of pulmonary circulation and respiratory status; and optimization of mechanical ventilation.	2011
American Family Physician	Neonatal resuscitation guidelines: Detection of exhaled carbon dioxide is recommended to confirm placement of a tracheal tube in neonates.	2010
European Society of Gastrointestinal Endoscopy	Capnography may help with seriously ill patients who: have multiple conditions; will undergo long-term sedation for prolonged or complex endoscopy procedures (ERCP, prosthesis placement, etc.). This type of monitoring: measures ventilation activity, predicts potential respiratory depression before a pulse oximeter may detect desaturation.	2006

There may be additional capnography standards and guidelines not listed in this document. This list was last updated November 2020.