The Use of End Tidal Carbon Dioxide (ETCO₂) for Moderate Sedation

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BACKGROUND

- Short acting analgesia and sedation medications are used during many procedures in the Emergency Department (ED).
- Patients require close monitoring for abnormal vital signs and other adverse occurrences, such as respiratory depression and apnea.
- Use of ETCO₂ is recommended by the Emergency Nurses Association (ENA).
- The ENA evidence-based Clinical Practice Guideline (2015) determined that capnography during moderate sedation detects respiratory depression and apnea faster than vital signs, pulse oximetry, and clinical assessment during short acting analgesia and sedation.

METHODS

- Design - Implementation of an evidence-based clinical practice guideline
- Sample – ECC RNs / EHR documentation of patients receiving moderate sedation
- Setting – Emergency Care Center
- Procedure:
  - Education to RNs – staff meetings, individual and group updates with PowerPoints, and emails on the use, setup, indications for ETCO₂
  - Incorporated education into the annual self-learning module for moderate sedation
  - Monthly audits of EHR for identified clinical outcomes:
    - Use of ETCO₂
    - VS during moderate sedation
    - Time to baseline
    - Presence of adverse events

RESULTS

- 23% of all audited charts between 9/19 - 7/20 had ETCO₂ documented per policy.
- 0% use in 11/19 & 12/19, this prompted re-education and spot training in 1/20 for an increase to 53% use between 2/20 - 7/20.
- 98% of audited records had a normal pulse oximetry reading; for those that had ETCO₂ documented, 47% had values greater than 10% outside of the normal limits.
- RNs noted and appropriately responded to abnormal ETCO₂ (with normal pulse oximetry). Patient condition stabilized with return to baseline.

IMPLICATIONS FOR PRACTICE

- Following COVID-19, the ECC will begin to use ETCO₂ in intubated patients to measure effectiveness of compressions and as a measure of ROSC.

DISCUSSION

- The opportunity exists to improve the use of ETCO₂ for moderate sedation. Further education and timely reinforcement will continue.
- Patients who predominately mouth breath result in the inability of nasal sensor to pick up ETCO₂ which may provide inaccurate readings.

CONCLUSION

- The use of ETCO₂ in theory and in practice allows detection of respiratory depression faster than pulse oximetry, allowing timely RN intervention with excellent patient outcomes.