

ETCO₂ Case Studies

Patient History:

Mr. Johnson is on continuous morphine PCA. Two hours after initiating his PCA, his RR decreased to 8 breaths/minute and his EtCO₂ increased from 38 to 53 mmHg (normal EtCO₂ 35-45 mmHg).

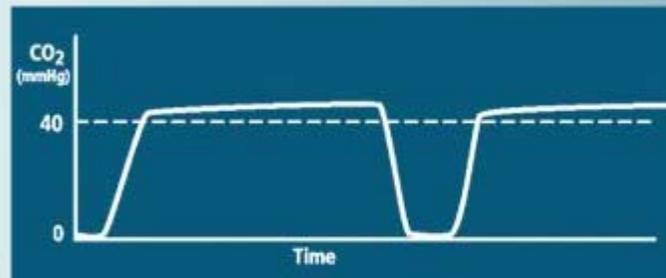
Clinical Findings & Abnormal Waveform:

- ↓ RR
- Tidal volumes relatively normal
- ↑ EtCO₂ because fewer breaths allowed more CO₂ to build up
- Slow, long exhalation, deep breathing cycle.

Possible Causes:

- Over medication/increased sedation
- Snoring or possible obstruction

Abnormal waveform: hypoventilation (deep breathing)



1Capnography in the Management of the Critically Ill Patient, EducationPAK for Critical Care and Procedural Sedation - A Guide to Capnography. CD-ROM - Needham, MA. Oridion Medical. 2003.

2AACN Procedure Manual for Critical Care 4th Ed. (2001). Ed. Lynn-McHale, D.J. & Carlson, K.K.. American Association of Critical Care Nurses.

3Thalan's Critical Care Nursing Diagnosis and Management 4th Ed. (2001). Ed. Urden, L.D.; Stacy, K.M.; & Lough, M.E. C.V. Mosby

****The following are examples of common EtCO₂ waveforms. The waveform trends are examples only and do not represent all potential abnormal waveforms. Analysis of these waveform trends may provide an early indication of the noted possible causes. The associated possible responses are suggestions only and are not meant to replace current clinical practice or hospital protocols. Always consult hospital protocols. Abnormal waveforms are not always associated with alarms.***



ETCO₂ Case Studies

Patient History:
Later the nurse noted Mr. Johnson's RR was 10 breaths/minute and EtCO₂ was 25 mmHg. He took a deep breath and EtCO₂ increased to 58 mmHg.

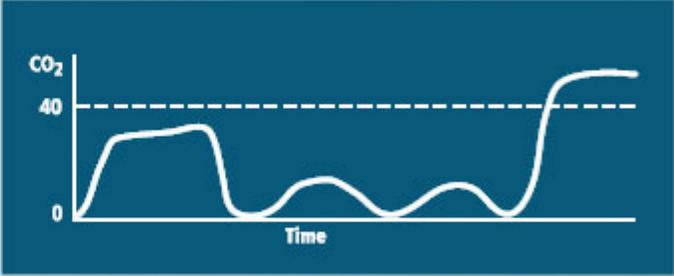
Clinical Findings & Abnormal Waveform:

- ↓ in RR
- ↓ in EtCO₂
- Loss of alveolar plateau
- Patient may be snoring followed by possible awaking period & deep breath
- Combination of shallow & deep breathing

Possible Causes:

- Over medication/increased sedation
- Low tidal volume

Abnormal Waveform: Hypoventilation (shallow breathing)



1Capnography in the Management of the Critically Ill Patient, EducationPAK for Critical Care and Procedural Sedation - A Guide to Capnography. CD-ROM - Needham, MA. Oridion Medical. 2003.

2AACN Procedure Manual for Critical Care 4th Ed. (2001). Ed. Lynn-McHale, D.J. & Carlson, K.K.. American Association of Critical Care Nurses.

3Thalan's Critical Care Nursing Diagnosis and Management 4th Ed. (2001). Ed. Urden, L.D.; Stacy, K.M.; & Lough, M.E. C.V. Mosby

****The following are examples of common EtCO₂ waveforms. The waveform trends are examples only and do not represent all potential abnormal waveforms. Analysis of these waveform trends may provide an early indication of the noted possible causes. The associated possible responses are suggestions only and are not meant to replace current clinical practice or hospital protocols. Always consult hospital protocols. Abnormal waveforms are not always associated with alarms.***



ETCO₂ Case Studies

Patient History:
Patient possibly not breathing.

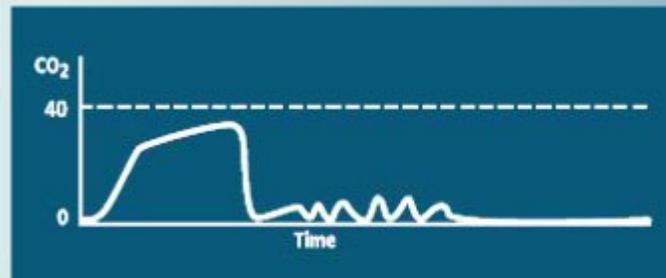
Clinical Findings & Abnormal Waveform:

- Sudden loss of EtCO₂ to zero or near zero value.
- ↓ in RR.
- ↓ in EtCO₂.
- Decrease in tidal volumes.
- No breath detected.
- Very shallow or no RR pattern observed.

Possible Causes:

- No Breath/Apnea
- Very shallow breathing with shallow tidal volume
- Over-medicated/sedate
- Kinked or displaced cannula/disposable

Abnormal Waveform: Hypoventilation (no breath detected)



1Capnography in the Management of the Critically Ill Patient, EducationPAK for Critical Care and Procedural Sedation - A Guide to Capnography. CD-ROM - Needham, MA. Oridion Medical. 2003.

2AACN Procedure Manual for Critical Care 4th Ed. (2001). Ed. Lynn-McHale, D.J. & Carlson, K.K.. American Association of Critical Care Nurses.

3Thalan's Critical Care Nursing Diagnosis and Management 4th Ed. (2001). Ed. Urden, L.D.; Stacy, K.M.; & Lough, M.E. C.V. Mosby

****The following are examples of common EtCO₂ waveforms. The waveform trends are examples only and do not represent all potential abnormal waveforms. Analysis of these waveform trends may provide an early indication of the noted possible causes. The associated possible responses are suggestions only and are not meant to replace current clinical practice or hospital protocols. Always consult hospital protocols. Abnormal waveforms are not always associated with alarms.***



ETCO₂ Case Studies

Patient History:
Mr. Johnson experienced sedation with frequent snoring.

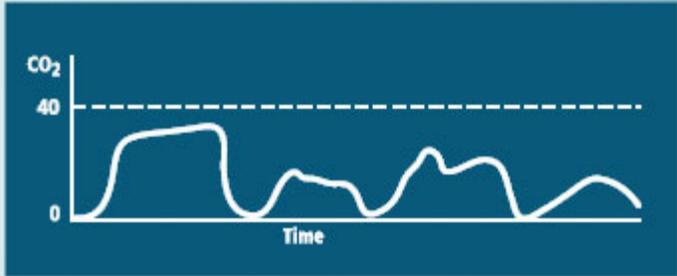
Clinical Findings & Abnormal Waveform:

- Waveform becomes erratic.
- ↓ RR.
- ↓ EtCO₂.
- ↓ in tidal volumes.
- Audible snoring.
- Relaxation of upper airway

Possible Causes:

- Poor head/neck alignment
- Overmedicated/sedated
- Relaxation of upper airway

Abnormal Waveform: Partial airway obstruction



1Capnography in the Management of the Critically Ill Patient, EducationPAK for Critical Care and Procedural Sedation - A Guide to Capnography. CD-ROM - Needham, MA. Oridion Medical. 2003.

2AACN Procedure Manual for Critical Care 4th Ed. (2001). Ed. Lynn-McHale, D.J. & Carlson, K.K.. American Association of Critical Care Nurses.

3Thalan's Critical Care Nursing Diagnosis and Management 4th Ed. (2001). Ed. Urden, L.D.; Stacy, K.M.; & Lough, M.E. C.V. Mosby

****The following are examples of common EtCO₂ waveforms. The waveform trends are examples only and do not represent all potential abnormal waveforms. Analysis of these waveform trends may provide an early indication of the noted possible causes. The associated possible responses are suggestions only and are not meant to replace current clinical practice or hospital protocols. Always consult hospital protocols. Abnormal waveforms are not always associated with alarms.***

