

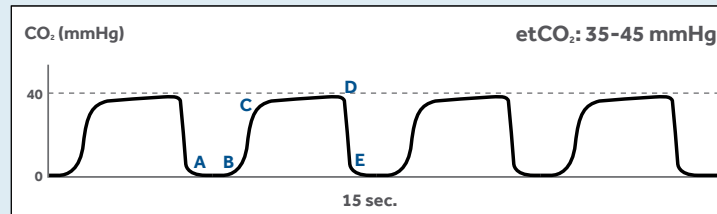
# NORMAL AND ABNORMAL $etCO_2$ /CAPNOGRAPH WAVEFORMS

## Normal Capnogram

The normal capnogram is a waveform which represents the varying  $CO_2$  level throughout the breath cycle.

### Waveform Characteristics:

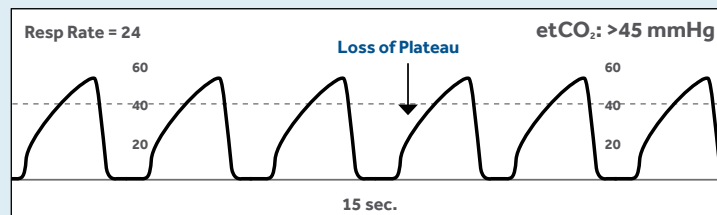
- A-B:** Baseline
- C:** Expiratory Upstroke
- D:** End-Tidal Concentration
- D-E:** Inspiration
- C-D:** Expiratory Plateau



## Bronchospasm/Asthma

### Other Possible Causes:

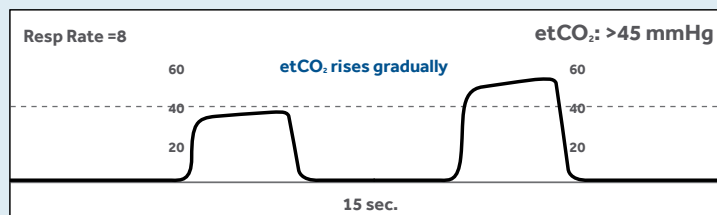
- Bronchospasm/COPD
- Obstruction in the expiratory limb of the breathing circuit
- Presence of a foreign body in the upper airway
- Partially kinked or occluded artificial airway



## \*Increasing $etCO_2$ (Hypoventilation)

### Other Possible Causes:

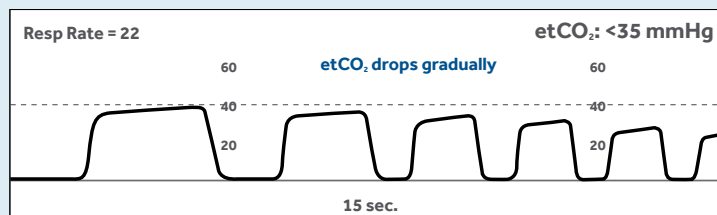
- Decrease in respiratory rate
- Decrease in tidal volume
- Increase in metabolic rate
- Rapid rise in body temperature (malignant hyperthermia)



## \*Decreasing $etCO_2$ (Hyperventilation)

### Other Possible Causes:

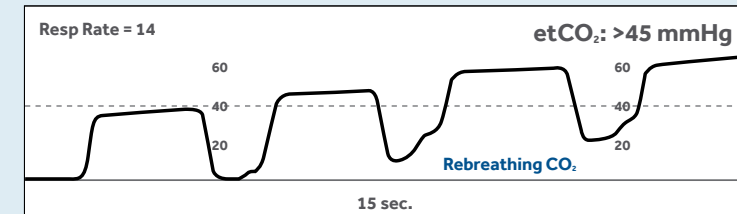
- Increase in respiratory rate
- Increase in tidal volume
- Metabolic acidosis
- Fall in body temperature



## Rebreathing $CO_2$

### Other Possible Causes:

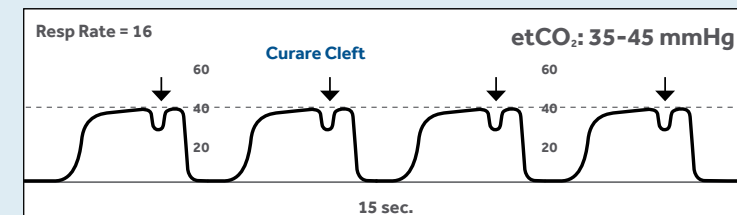
- Faulty expiratory valve
- Inadequate inspiratory flow
- Partial rebreathing
- Insufficient expiratory time



## Curare Cleft

### Other Possible Causes:

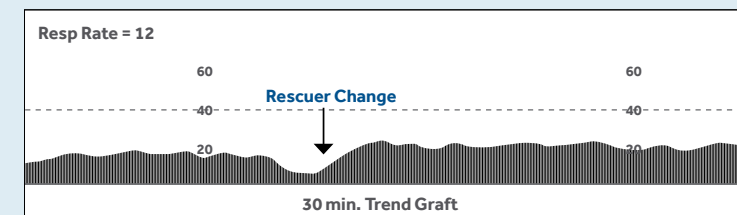
- Patient is mechanically ventilated
- Depth of cleft is inversely proportional to degree of muscle relaxants



## Cardiac Arrest

### Other Possible Causes:

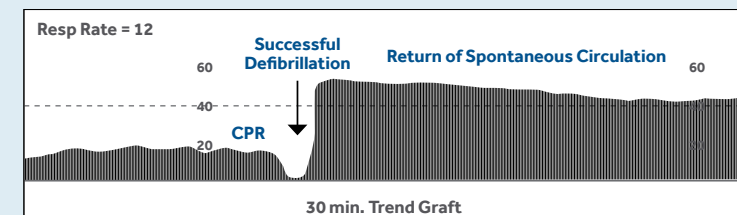
- Decreased or absent cardiac output
- Decreased or absent pulmonary blood flow
- Sudden decrease in  $CO_2$  values



## Return of Spontaneous Circulation

### Other Possible Causes:

- Increase in cardiac output
- Increase in pulmonary blood flow
- Gradual increase in  $CO_2$  production



\*Assumes adequate circulation and alveolar gas exchange