

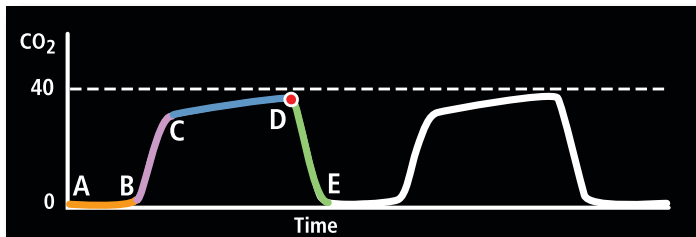
# A Quick Reference Guide to Waveform Capnography



**COVIDIEN**

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# Normal Waveform<sup>1</sup>



**A-B:** Baseline period of no CO<sub>2</sub>, end of inhalation

**B-C:** Rapid rise in CO<sub>2</sub>, early exhalation

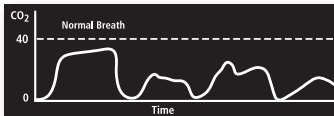
**D:** Alveolar plateau, end of expiration, end tidal CO<sub>2</sub> (etCO<sub>2</sub>)

**D-E:** Inhalation

# Abnormal Waveforms<sup>1</sup>

## FOR INTUBATED AND NON-INTUBATED PATIENTS

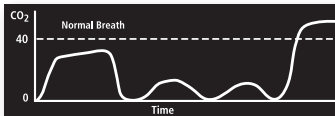
Always check function of equipment and follow your institutional protocols



### Partial airway obstruction (partial loss of waveform)

**Possible Causes (Non-intubated):**  
Airway collapse/blockage, secretions in the airway.

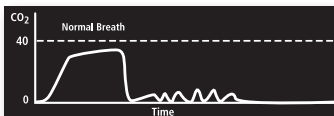
**Possible Causes (Intubated):**  
Secretions in the airway, ETT misplaced in hypopharynx, partially kinked ETT, air leak from uncuffed ETT.



### Hypoventilation with shallow breathing

**Possible Causes (Non-intubated):**  
Ineffective tidal volume due to sedation, opioids, or other respiratory depressive medications.

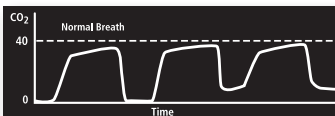
**Possible Causes (Intubated):**  
Ineffective tidal volume.



### Apnea (loss of waveform)

**Possible Causes (Non-intubated):**  
Sedation, opioids, or other respiratory depressive medications, kinked or displaced sampling line.

**Possible Causes (Intubated):**  
Dislodged ETT, ETT misplaced in hypopharynx, complete airway obstruction.



### Rebreathing of CO<sub>2</sub>

**Possible Causes (Non-intubated):**  
Insufficient oxygen flow, shallow breathing, not clearing dead space, or drape over face.

**Possible Causes (Intubated):**  
Faulty exhalation valve, dead space in ventilator circuit.



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# Troubleshooting

Alert Message	Action
<b>No Breath</b>	<ul style="list-style-type: none"><li>• Check patient status</li><li>• Check connection and positioning of patient sampling line</li></ul>
<b>FilterLine Disconnected</b>	<ul style="list-style-type: none"><li>• Ensure patient sampling line is correctly connected to the monitor. <b>Do not overtighten.</b></li></ul>
<b>Clear FilterLine</b>	<ul style="list-style-type: none"><li>• Check patient sampling line for kinks or fluids</li></ul>
<b>Blockage</b>	<ul style="list-style-type: none"><li>• Check patient sampling line for kinks</li><li>• Disconnect and reconnect patient sampling line</li><li>• If blockage cannot be cleared, replace patient sampling line</li></ul>
<b>Calibration Required</b>	<ul style="list-style-type: none"><li>• Calibrate according to manufacturer's recommendations</li></ul>

Technical Problem	Action
<b>Monitor will not turn on</b>	<ul style="list-style-type: none"><li>• Check A/C connection</li><li>• Ensure on/off switch is on</li><li>• Ensure battery is inserted correctly</li><li>• Replace or recharge battery or connect to AC power</li></ul>
<b>No waveform on screen</b>	<ul style="list-style-type: none"><li>• Check patient status</li><li>• Check position of patient sampling line</li><li>• Ensure patient sampling line is correctly connected to monitor. <b>Do not overtighten.</b></li><li>• Check for proper scale of waveform</li></ul>



# Integrated Pulmonary Index™ (IPI)

## IPI

The IPI algorithm incorporates four real-time respiratory measurements into a single number that represents an inclusive respiratory profile.



- End-tidal CO<sub>2</sub> (etCO<sub>2</sub>)
- Respiratory Rate (RR)
- Pulse Oximetry (SpO<sub>2</sub>)
- Pulse Rate (PR)

## IPI

IPI is displayed on a scale from 1 to 10, with 10 indicating a normal respiratory status. To aid in monitoring patients over time, IPI is captured and analyzed to show upward and downward trends.

IPI	Patient Status
10	Normal
8-9	Within normal range
7	Close to normal range; requires attention
5-6	Requires attention and may require intervention
3-4	Requires intervention
1-2	Requires immediate intervention



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