Microstream® Capnography Used to Detect Changes in Perfusion During a Code
Submitted by:
Monty Neel
Carrollton Fire Department
Carrollton, Texas

Profile
A 73-year-old female was reported unconscious and lying on the floor of a commercial warehouse. Carrollton Fire Department responded to find the patient who was pulseless and apneic at the scene with no bystander CPR being performed.

Clinical Situation
The patient was found to be in ventricular fibrillation when the paramedics arrived and was immediately defibrillated three times with no change in rhythm. The patient was intubated and first round medications were administered intravenously. Endotracheal tube placement was confirmed by auscultation, an esophageal bulb detector and EtCO₂. A good CO₂ waveform was maintained during manual compressions with continued ventilatory support.

Clinical Case
A second crewmember took over manual compressions and, although the depth/rate of compressions appeared adequate, the EtCO₂ began to fall. When this was noticed, the crewmember adjusted the depth/rate of compressions and the EtCO₂ began to rise to previous levels. After a return of spontaneous circulation, the end-tidal value rose sharply. A drop in end-tidal CO₂ was noticed when the patient lost her radial pulse but not the carotid pulse. A dopamine drip was started to treat the hypotension and the patient was prepared for transport. Enroute, the patient lost all palpable pulses with the monitor still showing sinus tachycardia and EtCO₂ waveform decreased slightly. Initial diagnostic assumption was PEA per protocol, but this was unlikely since end-tidal levels were around 26 mmHg. The patient’s condition was unchanged on arrival at the ED where the patient was stabilized and transported to the ICU.

Clinical Data Summary

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Initial Values</th>
<th>Effective Compressions</th>
<th>Ineffective Compressions</th>
<th>Return of Spontaneous Circulation</th>
<th>Hypotension</th>
<th>PEA (or drop in BP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EtCO₂ (mmHg)</td>
<td>12-14</td>
<td>12-14</td>
<td>Fell towards 0</td>
<td>86</td>
<td>32-35</td>
<td>26</td>
</tr>
<tr>
<td>BP (mmHg)</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>60/palpable</td>
<td>low</td>
<td>low</td>
</tr>
<tr>
<td>HR (bpm)</td>
<td>Absent</td>
<td>Absent</td>
<td>Absent</td>
<td>120</td>
<td>120</td>
<td>120</td>
</tr>
</tbody>
</table>