

# END TIDAL CARBON DIOXIDE LEVELS PREDICT CARDIAC ARREST

Harish Manyam, MD

Allegheny General Hospital, Pittsburgh, Pennsylvania

**Introduction:** End tidal carbon dioxide (CO<sub>2</sub>) correlates with cardiac output during cardiopulmonary resuscitation in cardiac arrest patients. Increasing CO<sub>2</sub> during CPR can also indicate the return of spontaneous circulation.

**Hypothesis:** CO<sub>2</sub> will decrease prior to a cardiac arrest in patients that are intubated in an intensive care setting.

**Methods:** CO<sub>2</sub> was continuously monitored and recorded every hour in forty-three patients who were intubated and on vasopressor medication.

**Results:** There were four cardiac arrest events, six patients who were acutely withdrawn from care, and six patients who had hypotensive events (systolic blood pressure<90) while on vasopressors. CO<sub>2</sub> measurements were evaluated in patients with an adverse event (acute withdrawal of care, cardiac arrest, and hypotension) at time periods of 1, 2, 3, 4, and 5 hours prior to the adverse event. Normal patients were categorized as those patients enrolled who did not have an adverse event. Mean CO<sub>2</sub> values were significantly higher in normal patients when compared to those in patients who had a cardiac arrest ( $30.18 \pm 4.93$  vs.  $17.45 \pm 4.76$ ;  $p<0.001$ ). CO<sub>2</sub> levels were significantly lower in cardiac arrest patients when compared to hypotensive patients 1, 2, 3, and 4 hours prior to a cardiac arrest (see Table). CO<sub>2</sub> levels were significantly lower in cardiac arrest patients when compared to patients who were acutely withdrawn from care 1,2,3, and 4 hours prior to event (see Table). CO<sub>2</sub> levels 5 hours prior to hypotension or acute withdrawal of care were not significantly different than cardiac arrest (see Table).

**Conclusion:** CO<sub>2</sub> levels are lower overall in cardiac arrest patients in comparison to normal patients. CO<sub>2</sub> values are lower in the four hours prior to cardiac arrest patients in comparison to the four hours prior to a hypotensive event. A patient who is withdrawn from care does not have a decrease in CO<sub>2</sub>. Increased numbers are needed to see if this relationship holds true on a large scale.

Hour(s) prior to event	Cardiac Arrest	Hypotension (SBP<90)	P value
1	16.50	20.67	P=0.013
2	16.25	21.83	P=0.013
3	16.50	22.67	P=0.002
4	16.75	21.33	P=0.024
5	21.25	21.33	P=0.99
Hour(s) prior to event	Cardiac Arrest	Acute Withdrawal of Care	P value
1	16.50	23.29	P=0.016
2	16.25	24.43	P=0.001
3	16.50	25.29	P<0.001
4	16.75	26	P<0.001
5	21.25	24.86	P=0.43