

CPR QUALITY: IMPROVING CARDIAC RESUSCITATION OUTCOMES BOTH INSIDE AND OUTSIDE THE HOSPITAL

American Heart Association Consensus Statement¹

In its June 25, 2013 issue of *Circulation*, the American Heart Association published a Consensus Statement titled, "*CPR Quality: Improving Cardiac Resuscitation Outcomes Both Inside and Outside the Hospital*." A consensus statement is defined as "A statement of the advised course of action in relation to a particular clinical topic, based on the collective views of a body of experts." This Statement was written by a panel of experts and has been endorsed by the American College of Emergency Physicians.

Worldwide, there are over 135 million deaths resulting from cardiovascular etiology. In the United States alone there are over 500,000 cardiac arrests annually, of which over 300,000 occur out of hospital, and that number is growing year over year. Unfortunately, less than 15% survive cardiac arrest.¹

The purpose of the AHA Consensus Statement on CPR Quality is to provide expert opinion and guidance in an effort to help improve survival rates from cardiac arrest. The Consensus Statement addresses the following key areas of CPR quality for the trained rescuer:¹

- Metrics of CPR performance
- Monitoring, feedback and integration of the patient's response to CPR
- Team-level logistics to ensure performance of high-quality CPR
- Continuous quality improvement on provider, team and system levels

Highlighted in the monitoring, feedback and integration section of the 2013 AHA Consensus Statement is the recommended use of capnography. Capnography is a non-invasive tool used to objectively measure end-tidal CO₂ (etCO₂), which indicates the status of metabolism, ventilation and perfusion (blood flow) in real-time. During cardiac arrest, monitoring quantitative waveform capnography is important during CPR to assess blood flow in two ways:

- To improve chest compression performance if etCO₂ is <10 mmHg during CPR (Class IIb, LOE C)¹
- To consider an abrupt sustained increase to a normal value (35 – 45 mmHg) as an indicator of ROSC (Class IIa, LOE B)¹

End-tidal CO₂ concentrations during CPR are primarily dependent on pulmonary blood flow and therefore cardiac output. Failure to maintain etCO₂ at >10 mmHg during adult CPR can reflect poor cardiac output and often strongly predicts unsuccessful resuscitation.

Recommendation

When available, etCO₂ should be the primary physiological metric when neither an arterial nor a central venous catheter is in place at the time of the cardiac arrest and CPR. Titrate CPR performance to a goal etCO₂ of >20 mmHg while not excessively ventilating the patient (respiratory rate <12 breaths per minute, with only minimal chest rise).¹

References

1. Meaney PA, Bobrow BJ, Mancini ME, Christenson J, de Caen AR, Bhanji F, Abella BS, Kleinman ME, Edelson DP, Berg RA, Aufderheide TP, Menon V, Leary M; on behalf of the CPR Quality Summit Investigators, the American Heart Association Emergency Cardiovascular Care Committee, and the Council on Cardiopulmonary, Critical Care, Perioperative and Resuscitation. CPR quality: improving cardiac resuscitation outcomes both inside and outside the hospital: a consensus statement from the American Heart Association. *Circulation*. 2013;128:1–19.