Advanced Cardiac Resuscitation (ACR) Clinical Core Beliefs

ACR Sudden Cardiac Arrest Care (SCA) Methodology is specific for Adult Non-traumatic SCA

The ACR Consortium believes providing focused care to optimize these four pressures in SCA patient helps to improve rates of neurologically intact survival (NIS).

Intercranial pressure (ICP) **Intrathoracic Pressure (ITP)** **Cerebral Perfusion Pressure (CerPP)** **Coronary Perfusion Pressure (CorPP)**

Manual CPR

- ✓ All SCA resuscitations begin w/ high quality manual CPR (HQ-CPR)
- ✓ Real-Time CPR feedback has demonstrated improvement in NIS[1]
- ✓ SCA witnessed by EMS should receive immediate defibrillation if rhythm is shockable. HQ-CPR should be performed while device is prepared

Use of an Impedance Threshold Device (ITD)

- ✓ ITD selectively prevents air from entering the lungs during chest wall recoil phase (except when intended during ventilation)
- ✓ This pulls more blood back into the heart and lowers ICP[2]

Clinically Appropriate Airway and Ventilation

- ✓ Avoid hyperventilation (volume and rate)
- ✓ Consider Real-Time Ventilation Feedback (VFD) or Mechanical Ventilators
- ✓ VFD can ensure ventilation is within evidence-based recommendations[3]
- ✓ Excessive Positive Pressure Ventilation prohibits development of negative intrathoracic pressure during chest wall recoil (↓ venous return to heart)[4]
- ✓ Unrecognized and inadvertent hyperventilation may be contributing to the currently dismal survival rates from cardiac arrest[4]

Clinically Appropriate Epinephrine

- ✓ Consider minimizing the use of epinephrine as it is associated with higher rates of ROSC but not NIS[7]
- ✓ In large, randomized trials, the use of epinephrine has shown improvement in survival at 30 days compared to placebo, but no significant difference in neurologically intact survival (NIS)
- ✓ In the epinephrine group, more survivors had severe neurologic impairment[7]

Continuous Uninterrupted Compressions using Mechanical CPR (MCPR)

- ✓ Goal >95% Chest Compression Fraction (CCF)
- ✓ Control deployment with minimal pauses. No "Crash" Deployment
- ✓ Goal ≤5 sec when transitioning to MCPR
- ✓ All pauses <3 sec. No pausing for airway or patient movement
- ✓ If possible, interpret rhythm / deliver shock without pause for pulse checks

Expanded use of Waveform Capnography ($ETCO_2$)

- ✓ $ETCO_2$, when used appropriately, can guide the management of cardiac arrest
- ✓ If $ETCO_2$ is very low after prolonged resuscitation, consider terminating efforts
- ✓ $ETCO_2$ can be used to make improved decisions regarding defibrillation and medication administration
- ✓ Sudden Spikes of $ETCO_2$, should be used in conjunction with changes in blood pressure to detect Return of Spontaneous Circulation (ROSC)

Clinically Appropriate Defibrillation

- ✓ Defibrillate VF or VT if $ETCO_2$ is >20 (N/A for EMS-witnessed SCA from VF/VT)
- ✓ Defibrillation more successful when administered immediately after onset of VF/VT. However, when VF/VT is more prolonged, depletion of the heart's energy reserves can compromise the efficacy of defibrillation unless replenished by CPR[5]
- ✓ Higher $ETCO_2$ values were associated with an increased likelihood of conversion to a perfusing rhythm following the first attempted defibrillation[6]

Quality Assurance

- ✓ 100% of SCAs should be reviewed. QA should include review of PCR and Clinical and Biometric Feedback
- ✓ Education and Training should be developed from lessons learned during QA

References:

[1]Bobrow et al., 2013 - [2]Metzger AK, et al., 2012 - [3]Charlton et al., 2021 - [4]Aufderheide et al., 2004 - [5]Panchal et al., 2020 - [6]Hubble et al., 2021 - [7]Perkins et al., 2018