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Part 3: Adult Basic and Advanced Life Support

2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care

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TOP 10 TAKE-HOME MESSAGES FOR ADULT CARDIOVASCULAR LIFE SUPPORT

1. On recognition of a cardiac arrest event, a layperson should simultaneously and promptly activate the emergency response system and initiate cardiopulmonary resuscitation (CPR).
2. Performance of high-quality CPR includes adequate compression depth and rate while minimizing pauses in compressions,
3. Early defibrillation with concurrent high-quality CPR is critical to survival when sudden cardiac arrest is caused by ventricular fibrillation or pulseless ventricular tachycardia.
4. Administration of epinephrine with concurrent high-quality CPR improves survival, particularly in patients with nonshockable rhythms.
5. Recognition that all cardiac arrest events are not identical is critical for optimal patient outcome, and specialized management is necessary for many conditions (eg, electrolyte abnormalities, pregnancy, after cardiac surgery).
6. The opioid epidemic has resulted in an increase in opioid-associated out-of-hospital cardiac arrest, with the mainstay of care remaining the activation of the emergency response systems and performance of high-quality CPR.
7. Post–cardiac arrest care is a critical component of the Chain of Survival and demands a comprehensive, structured, multidisciplinary system that requires consistent implementation for optimal patient outcomes.
8. Prompt initiation of targeted temperature management is necessary for all patients who do not follow commands after return of spontaneous circulation to ensure optimal functional and neurological outcome.
9. Accurate neurological prognostication in brain-injured cardiac arrest survivors is critically important to ensure that patients with significant potential for recovery are not destined for certain poor outcomes due to care withdrawal.
10. Recovery expectations and survivorship plans that address treatment, surveillance, and rehabilitation need to be provided to cardiac arrest survivors and their caregivers at hospital discharge to optimize transitions of care to home and to the outpatient setting.

PREAMBLE

In 2015, approximately 350 000 adults in the United States experienced nontraumatic out-of-hospital cardiac arrest (OHCA) attended by emergency medical services (EMS) personnel.[1] Approximately 10.4% of patients with OHCA survive their initial hospitalization, and 8.2% survive with good functional status. The key drivers of successful resuscitation from OHCA are lay rescuer cardiopulmonary

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Recommendations for CPR Feedback and Monitoring		
COR	**LOE**	**Recommendations**
2b	B-R	1. It may be reasonable to use audiovisual feedback devices during CPR for real-time optimization of CPR performance.
2b	C-LD	2. It may be reasonable to use physiological parameters such as arterial blood pressure or end-tidal CO_2 when feasible to monitor and optimize CPR quality.

Recommendation-Specific Supportive Text

1. A 2020 ILCOR systematic review found that most studies did not find a significant association between real-time feedback and improved patient outcomes.[4] However, no studies identified significant harm, and some demonstrated clinically important improvement in survival. One recent RCT reported a 25.6% increase in survival to hospital discharge from IHCA with audio feedback on compression depth and recoil (54% versus 28.4%; *P*<0.001).[45]
2. An analysis of data from the AHA's Get With The Guidelines-Resuscitation registry showed higher likelihood of ROSC (odds ratio, 1.22; 95% CI, 1.04–1.34; *P*=0.017) when CPR quality was monitored using either $ETCO_2$ or diastolic blood pressure.[46] An observational study in adult patients (IHCA and OHCA) reported that for every 10 mm compression depth increase, $ETCO_2$ increased 1.4 mm Hg.[47] A 2018 systematic review of $ETCO_2$ as a prognostic indicator for ROSC[48] found variability in cutoff values, but less than 10 mm Hg was generally associated with poor outcome and greater than 20 mm Hg had a stronger association with ROSC than a value of greater than 10 mm Hg. The combination of the association of higher $ETCO_2$ with ROSC and the finding that increased chest compression depth can increase $ETCO_2$ suggests that targeting compressions to a value of at least 10 mm Hg, and ideally 20 mm Hg or greater, may be useful. The validity and reliability of $ETCO_2$ in nonintubated patients is not well established. When available, invasive arterial blood pressure monitoring may also help assess and guide CPR efforts. The use of diastolic blood pressure monitoring during cardiac arrest was associated with higher ROSC,[46] but there are inadequate human data to suggest any specific pressure.

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