MyEMCert

KEY ADVANCES
CLINICAL POLICY ALERT

American Heart Association Focused Updates for ACLS from 2018, 2019, 2020, and 2023

Updated May 2024

2018 American Heart Association Focused Update on Advanced Cardiovascular Life Support Use of Antiarrhythmic Drugs During and Immediately After Cardiac Arrest: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care (1)

2019 American Heart Association Focused Update on Advanced Cardiovascular Life Support Use of Advanced Airways, Vasopressors, and Extracorporeal Cardiopulmonary Resuscitation During Cardiac Arrest: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care (2)

Adult Basic and Advanced Life Support Writing Group. Part 3: Adult Basic and Advanced Life Support: 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care (3)

2023 American Heart Association Focused Update on Adult Advanced Cardiovascular Life Support: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care (4)

2023 American Heart Association Focused Update on the Management of Patients With Cardiac Arrest or Life-Threatening Toxicity Due to Poisoning: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care (5)

Policy Recommendations and Focus Points in bold

2018 Recommendations for Use of Antiarrhythmic Drugs During Resuscitation From Adult Ventricular Fibrillation/Pulseless Ventricular Tachycardia (VF/pVT) Cardiac Arrest

Patient Management Recommendations:

Amiodarone and Lidocaine Recommendation—Updated

- **Amiodarone or lidocaine may be considered for VF/pVT that is unresponsive to defibrillation. These drugs may be particularly useful for patients with witnessed arrest, for whom time to drug administration may be shorter (Class IIb; Level of Evidence B-R).**

Magnesium Recommendation—Updated 2018

- **The routine use of magnesium for cardiac arrest is not recommended in adult patients (Class III: No Benefit; Level of Evidence C-LD). Magnesium may be considered for torsades de pointes (i.e., polymorphic VT associated with long-QT interval) (Class Iib; Level of Evidence C-LD). The wording of this recommendation is consistent with the American Heart Association's 2010 Advanced Cardiovascular Life Support (ACLS) guidelines.**

2018 Recommendations for Antiarrhythmic Drugs Immediately After Return of Spontaneous Circulation (ROSC) Following Cardiac Arrest

β-Blocker Recommendation—Updated 2018

- **There is insufficient evidence to support or refute the routine use of a β-blocker early (within the first hour) after ROSC.**

Lidocaine Recommendations—Updated 2018

- **There is insufficient evidence to support or refute the routine use of lidocaine early (within the first hour) after ROSC.**

- **In the absence of contraindications, the prophylactic use of lidocaine may be considered in specific circumstances (such as during emergency medical services transport) when treatment of recurrent VF/pVT might prove to be challenging (Class Iib; Level of Evidence C-LD).**

2019 Recommendations for Use of Advanced Airways, Vasopressors, and Extracorporeal Cardiopulmonary Resuscitation (ECPR) During Cardiac Arrest

Patient Management Recommendations:

Choice of an Advanced Airway—Updated 2019

- **Either bag-mask ventilation or an advanced airway strategy may be considered during CPR for adult cardiac arrest in any setting (Class 2b; Level of Evidence B-R).**

- **If an advanced airway is used, the supraglottic airway device (SGA) can be used for adults with out-of-hospital cardiac arrest (OHCA) in settings with low tracheal intubation**

success rate or minimal training opportunities for endotracheal tube (ETT) placement (Class 2a; Level of Evidence B-R).

- **If an advanced airway is used, either the SGA or ETT can be used for adults with OHCA in settings with high tracheal intubation success rates or optimal training opportunities for ETT placement (Class 2a; Level of Evidence B-R).**

- **If an advanced airway is used in the in-hospital setting by expert providers trained in these procedures, either the SGA or ETT can be used (Class 2a; Level of Evidence B-R).**

- **Frequent experience or frequent re-training is recommended for providers who perform endotracheal intubation (Class 1; Level of Evidence B-NR).**

- **Emergency medical services systems that perform prehospital intubation should provide a program of ongoing quality improvement to minimize complications and to track overall SGA and ETT placement success rates (Class 1; Level of Evidence C-EO).**

Use of Vasopressors in Cardiac Arrest—Updated 2023

Recommendation: Standard-Dose Epinephrine—Updated 2023

- **We recommend that epinephrine be administered to patients in cardiac arrest (Class 1; Level of Evidence B-R). Based on the protocol used in clinical trials, it is reasonable to administer 1 mg every 3 to 5 minutes (Class 2a; Level of Evidence C-LD).**

Recommendation: Standard-Dose Epinephrine Versus High-Dose Epinephrine—Unchanged

- **High-dose epinephrine is not recommended for routine use in cardiac arrest (Class 3: No Benefit; Level of Evidence B-R).**

Recommendation: Vasopressin Versus Epinephrine—Updated 2023

- **Vasopressin may be considered in a cardiac arrest but offers no advantage as a substitute for epinephrine in cardiac arrest (Class 2b; Level of Evidence C-LD).**

Recommendation: Epinephrine in Combination With Vasopressin Versus Epinephrine Only — Updated 2019

- **Vasopressin in combination with epinephrine may be considered during cardiac arrest but offers no advantage as a substitute for epinephrine alone (Class 2b; Level of Evidence C-LD).**

Recommendations: Timing of Epinephrine Administration—Updated 2023

- **With respect to timing, for cardiac arrest with a nonshockable rhythm, it is reasonable to administer epinephrine as soon as feasible (Class 2a; Level of Evidence C-LD).**

- **With respect to timing, for cardiac arrest with a shockable rhythm, it may be reasonable to administer epinephrine after initial defibrillation attempts have failed (Class 2b; Level of Evidence C-LD).**

Recommendations: Extracorporeal CPR (ECPR)—Updated 2023

- **There is insufficient evidence to recommend the routine use of ECPR for patients with cardiac arrest.**

- **ECPR may be considered for selected patients as rescue therapy when conventional CPR efforts are failing in settings in which it can be expeditiously implemented and supported by skilled providers (Class 2b; Level of Evidence C-LD).**

Use of Resuscitation Adjuncts—Updated 2020

Recommendation: Use of End-tidal CO_2 ($ETCO_2$) in Resuscitation

- **Continuously measuring $ETCO_2$ during ACLS resuscitation may be useful to improve CPR quality (Class 2b, LOE C-LD).**

Recommendation: Use of Double Sequential Defibrillation

- **Routine use of double sequential defibrillation is not recommended (Class 2b, LOE C-LD).**
- **Note: A recent randomized trial has demonstrated survival benefit of double sequential defibrillation for patients with refractory VF (i.e., VF persists after 3 standard shocks) (6)**

Special Considerations—Updated 2020

Recommendations: Cardiac Arrest in Pregnancy

- **Management of cardiac arrest in pregnancy focuses on maternal resuscitation, with preparation for early perimortem cesarean delivery if necessary to save the infant and improve the chances of successful resuscitation of the mother (Class 1, LOE C-LD).**

- **Fetal monitoring should not be undertaken during cardiac arrest in pregnancy because of potential interference with maternal resuscitation (Class 1, LOE C-EO).**

- **Targeted temperature management for pregnant women who remain comatose after resuscitation from cardiac arrest is recommended (Class 1, LOE C-EO).**

- **During targeted temperature management of the pregnant patient, it is recommended that the fetus be continuously monitored for bradycardia as a potential complication, and obstetric and neonatal consultation should be sought (Class 1, LOE C-EO).**

Recommendation: Resuscitation Debriefing

- **After a resuscitation, debriefing for lay rescuers, emergency medical services providers, and hospital-based healthcare workers may be beneficial to support their mental health and well-being (Class 2b, LOE C-LD).**

2023 Updates on Vasopressor Medications During Cardiac Arrest

- **It is recommended that epinephrine be administered for patients in cardiac arrest. (Class 1, LOE B-R)**
- **It is reasonable to administer epinephrine 1 mg every 3 to 5 minutes for cardiac arrest. (Class 2a, LOE B-R)**
- **It is reasonable to administer epinephrine as soon as feasible for nonshockable rhythm. (Class 2a, LOE C-LD)**
- **Vasopressin alone or in combination with methylprednisolone offers no advantage as a substitute for epinephrine. (Class 2b, LOE B-R)**
- **It may be reasonable to administer epinephrine after initial defibrillation attempts have failed for cardiac arrest with shockable rhythm. (Class 2b, LOE C-LD)**

2023 Updates on Nonvasopressor Medications During Cardiac Arrest

- **Amiodarone or lidocaine may be considered forVF/pVT that is unresponsive to defibrillation. (Class 2, LOE B-R)**
- **For patients with OHCA, use of steroids during CPR is of uncertain benefit. (Class 2b, LOE C-LD)**
- **Routine administration of calcium for treatment of cardiac arrest is not recommended. (Class 3: No Benefit, LOE B-R)**
- **Routine use of sodium bicarbonate is not recommended for patients in cardiac arrest. (Class 3: No Benefit, LOE B-R)**
- **Routine use of magnesium for cardiac arrest is not recommended. (Class 3: No Benefit, LOE B-R)**

2023 Updates on ECPR for Cardiac Arrest

- **Use of ECPR for patients with cardiac arrest refractory to standard ACLS is reasonable in select patients when provided within an appropriately trained and equipped systems of care. (Class 2a, LOE B-R)**

2023 Updates on Percutaneous Coronary Intervention After Cardiac Arrest

- **Coronary angiography should be performed emergently for all cardiac arrest patients with suspected cardiac cause of arrest and ST-segment elevation on electrocardiogram. (Class 1, LOE B-NR)**

- **Emergent coronary angiography is reasonable for selected adult patients without ST-elevation on electrocardiogram but with elevated risk of significant coronary artery disease where revascularization may provide benefit, such as those with shock, electrical instability, signs of significant ongoing myocardial damage, or ongoing ischemia. (Class 2a, LOE B-NR)**

- **Independent of a patient's neurologic status, coronary angiography is reasonable in all post-cardiac arrest patients for whom coronary angiography is otherwise indicated. (Class 2a, LOE C-LD)**

- **Emergent coronary angiography is not recommended over a delayed or selective strategy in patients with ROSC after cardiac arrest in the absence of ST-segment elevation, shock, electrical instability, signs of significant myocardial damage, and ongoing ischemia. (Class 3: No Benefit, LOE B-R)**

2023 Updates on Indications for Temperature Control

- **We recommend all adults who do not follow commands after ROSC, irrespective of arrest location or presenting rhythm, receive treatment that includes a deliberate strategy for temperature control. (Class 1, LOE B-R)**

2023 Updates on Performance of Temperature Control

- **We recommend selecting and maintaining a constant temperature between 32°C and 37.5°C during post-arrest temperature control. (Class 1, LOE B-R)**

- **We recommend hospitals develop protocols for post-arrest temperature control. (Class 1, LOE B-NR)**

2023 Updates on Diversity, Equity, and Inclusion

- **It is reasonable for researchers studying cardiac arrest to develop and implement methods to promote recruitment and representation of participants from diverse backgrounds. (Class 2a, LOE C-EO)**

2023 Focused Update on Management of Patients with Cardiac Arrest Due to Poisoning

- High-dose insulin is recommended to be administered for hypotension due to β-blocker poisoning refractory to or in conjunction with vasopressor therapy. (Class 1, LOE B-NR)

- It is recommended that vasopressors be administered for hypotension due to β-blocker poisoning. (Class 1, LOE C-LD)

- High-dose insulin is recommended to be administered for hypotension due to calcium channel blocker poisoning. (Class 1, LOE B-NR)

- It is recommended that vasopressors be administered for hypotension due to calcium channel blocker poisoning. (Class 1, LOE C-LD)

- It is recommended to use rapid external cooling for life-threatening hyperthermia from cocaine poisoning. (Class 1, LOE C-LD)

- It is recommended to administer hydroxocobalamin for cyanide poisoning. (Class 1, LOE C-LD)

- It is recommended that sodium nitrite be administered for cyanide poisoning when hydroxocobalamin is unavailable. (Class 1, LOE C-LD)

- It is recommended to administer digoxin-specific antibody fragments (digoxin-Fab) for digoxin or digitoxin poisoning. (Class 1, LOE B-NR)

- It is recommended to administer intravenous lipid emulsion for local anesthetic poisoning. (Class 1, LOE C-LD)

- It is recommended to use benzodiazepines to treat seizures associated with local anesthetic systemic toxicity. (Class 1, LOE C-LD)

- It is recommended to administer methylene blue for methemoglobinemia. (Class 1, LOE B-NR)

- For patients known or suspected to be in cardiac arrest, in the absence of a proven benefit from the use of naloxone, standard resuscitative measures should take priority over naloxone administration, with a focus on high-quality CPR (compressions plus ventilation). (Class 1, LOE C-EO)

- After return of spontaneous breathing, patients should be observed in a healthcare setting until the risk of recurrent opioid toxicity is low and the patient's level of consciousness and vital signs have normalized. (Class 1, LOE C-LD)

References:

1. Panchal AR, Berg KM, Kudenchuk PJ, Del Rios M, Hirsch KG, Link MS, Kurz MC, Chan PS, Cabañas JG, Morley PT, Hazinski MF, Donnino MW. 2018 American Heart Association focused update on advanced cardiovascular life support use of antiarrhythmic drugs during and immediately after cardiac arrest: an update to the American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation.* 2018;138:e740–e749. doi:10.1161/CIR.0000000000000613.
2. Panchal AR, Berg KM, Hirsch KG, Kudenchuk PJ, Del Rios M, Cabañas JG, Link MS, Kurz MC, Chan PS, Morley PT, Hazinski MF, Donnino MW. 2019 American Heart Association

focused update on advanced cardiovascular life support use of advanced airways, vasopressors, and extracorporeal cardiopulmonary resuscitation during cardiac arrest: an update to the American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation*. 2019;140:e881–e894. doi:10.1161/CIR.0000000000000732.

3. Panchal AR, Bartos JA, Cabañas JG, Donnino MW, Drennan IR, Hirsch KG, Kudenchuk PJ, Kurz MC, Lavonas EJ, Morley PT, O'Neil BJ, Peberdy MA, Rittenberger JC, Rodriguez AJ, Sawyer KN, Berg KM; Adult Basic and Advanced Life Support Writing Group. Part 3: Adult basic and advanced life support: 2020 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation.* 2020;142(16_suppl_2):S366-S468. doi:10.1161/CIR.0000000000000916. Epub 2020 Oct 21. PMID: 33081529.
4. Perman SM, Elmer J, Maciel CB, Uzendu A, May T, Mumma BE, Bartos JA, Rodriguez AJ, Kurz MC, Panchal AR, Rittenberger JC; American Heart Association. 2023 American Heart Association focused update on adult advanced cardiovascular life support: an update to the American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation.* 2024;149(5):e254-e273. doi:10.1161/CIR.0000000000001194. Epub 2023 Dec 18. PMID: 38108133.
5. Lavonas EJ, Akpunonu PD, Arens AM, Babu KM, Cao D, Hoffman RS, Hoyte CO, Mazer-Amirshahi ME, Stolbach A, St-Onge M, Thompson TM, Wang GS, Hoover AV, Drennan IR; American Heart Association. 2023 American Heart Association focused update on the management of patients with cardiac arrest or life-threatening toxicity due to poisoning: an update to the American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation.* 2023;148(16):e149-e184. doi:10.1161/CIR.0000000000001161. Epub 2023 Sep 18. PMID: 37721023.
6. Cheskes S, Verbeek R, Drennan IR, et al. Defibrillation strategies for refractory ventricular fibrillation. *N Engl J Med.* 2022;387:1947-1956.

Resources for additional learning:

https://pubmed.ncbi.nlm.nih.gov/?term=adult+emergency+cardiac+arrest

https://www.resuscitationacademy.org/blog/

https://rebelem.com/rebel-cast-ep77-2019-acls-update/

https://www.ahajournals.org/doi/epub/10.1161/CIR.0000000000000732

https://canadiem.org/2020-american-heart-association-guidelines-for-adult-basic-and-advanced-life-support/

Authors
Sean Fox, M.D. (Lead); Timothy Horeczko, M.D.

Editors
Christopher Carpenter, M.D.; Christopher Edwards, PharmD.; Marianne Gausche-Hill, M.D.; Stephen Hayden, M.D.; Samuel Keim, M.D., M.S.; John Marshall, M.D., M.B.A.; Ernest Wang, M.D.