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The American heart association (AHA) revised and published its evidence updates on management of cardiac arrest – The AHA 2015 Guidelines for CPR and ACLS. The 2015 guidelines for Adult cardiac arrest resuscitation is given in Figure 1. The key features, recommendations and some important changes in this revision when compared to the earlier edition (ACLS 2010) are discussed below.

## Key features and changes in Adult BLS and CPR Quality:

1. Emergency response system (ERS) activation may be done without leaving patients side (by using a mobile).
2. Recommended sequence for single rescuer is C-A-B to reduce delay to first compression.
3. Single rescuer compression:breath - 30 compressions to be followed by 2 breaths.
4. Chest compression rate - CPR rate is 100 -120/min not exceeding 140/min (as this may be harmful).
5. Depth of at least 2” (5cm) not greater than 2.4” (6cm). Deeper compressions may be harmful.

## Key Changes in Adult ACLS:

1. Vasopressin has been removed from the algorithm.
2. Administer epinephrine as soon as possible after onset of cardiac arrest due to a non-shockable rhythm
3. To consider low EtCO2 after 20 min of CPR along with a combination of other factors to terminate CPR.
4. Steroids bundled with vasopressin and epinephrine may provide benefit in treating in-hospital cardiac arrest
5. Early provision of epinephrine in patients with non-shockable rhythm.
6. Routine lidocaine use is not recommended. It may be initiated after ROSC from VF/VT.
7. Beta blocker may be initiated after hospitalization from cardiac arrest due to VF/VT.
8. Extracorporeal CPR (ECPR) may be considered in select cardiac patients in settings where it may be implemented rapidly

The recommendations in this update are based on an extensive evidence review process by the International Liaison committee on Resuscitation (ILCOR) between 2010 and 2015. The evidence was evaluated using the standardized methodological approach proposed by the Grading of Recommendations Assessment, Development and Evaluation (GRADE) working group.

### Classes of recommendations:

- **Class I** – Strong, Benefit >>> Risk – 25%
- **Class IIa** – Moderate, Benefit > Risk – 23%
- **Class IIb** – Weak, Benefit ≥ Risk – 45%
- **Class III** – No Benefit (Moderate), Benefit = Risk – 2%
- **Class IV** – Harm (Strong), Risk > Benefit – 5%

### Adjuncts to CPR and ACLS:

The following other recommendations were made (Grade of evidence in brackets):

- Oxygen dose during CPR: Maximal inspired O2 concentrations may be used as the detrimental effects due to hyperoxia are unlikely to occur. (IIb) (Continued next page)
Figure 1: ACLS 2015 Update – Adult cardiac arrest resuscitation

1. Start CPR
   - Give oxygen
   - Attach monitor/defibrillator

2. Yes: Rhythm shockable?
   - VF/pVT
     - Shock (3)
     - CPR 2 min
       - IV/I.O. access
       - Rhythm shockable?
         - Yes: Shock (5)
         - No: CPR 2 min
           - Epinephrine every 3-5 min
           - Consider advanced airway, capnography
           - Rhythm shockable?
             - Yes: Shock (7)
             - No: CPR 2 min
               - Amiodarone
               - Treat reversible causes
               - Rhythm shockable?
                 - Yes: Shock
                 - No: CPR 2 min
                   - IV/I.O. access
                   - Epinephrine every 3-5 min
                   - Consider advanced airway, capnography
                   - Rhythm shockable?
                     - Yes: CPR 2 min
                       - Go to 5 or 7
                     - No: CPR 2 min
                       - Treat reversible causes
                       - Rhythm shockable?
                         - Yes: CPR 2 min
                           - Go to 5 or 7
                         - No: Go to 5 or 7

3. Shock

4. CPR 2 min
   - IV/I.O. access

5. Shock

6. CPR 2 min
   - Epinephrine every 3-5 min
   - Consider advanced airway, capnography

7. Shock

8. CPR 2 min
   - Amiodarone
   - Treat reversible causes

9. No: Asystole/PEA

10. CPR 2 min
    - IV/I.O. access
    - Epinephrine every 3-5 min
    - Consider advanced airway, capnography

11. CPR 2 min
    - Treat reversible causes

12. CPR 2 min
    - If no signs of return of spontaneous circulation (ROSC), go to 10 or 11
    - If ROSC, go to Post-Cardiac Arrest Care

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Adjuncts to CPR and ACLS (continued...)

- Monitoring physiologic parameters during CPR
  Reasonable use of physiologic parameters (quantitative waveform capnography, arterial relation diastolic pressure, arterial pressure monitoring and central venous oxygensaturation) to monitor and optimize CPR quality, guide vasopressor therapy and detect ROSC but precise numerical targets for these parameters have not been specified. (IIb)
- Ultrasound during cardiac arrest may be used – usefulness not established.
- Bag-mask ventilation vs advanced airway during CPR – no significant difference in survival.
- Assessment of tracheal tube placement by continuous waveform capnography in addition to clinical assessment is recommended as the most reliable method of confirming and monitoring correct placement of an ETT (I).
  Reasonable alternatives are no waveform CO2 detector, esophageal detector device, or US by an experienced operator (IIa)
- Ventilation after an advanced airway placement at the rate of 1 breath every 6 seconds (IIb)
- Defibrillators are recommended to treat atrial and ventricular arrhythmias (I) and biphasic defibrillators are preferred to monophasic (IIa)
- Giving single shock is reasonable as opposed to stacked shocks (IIa)
- Amiodarone may be used VF/VT not responsive to CPR, defibrillation and vasopressor therapy (IIb)
- The routine use of Magnesium is not recommended for adult patient (III)
- Standard dose epinephrine (1mg q3-5minutes) may be used for patients in cardiac arrest (IIb)
- Routine use of lidocaine after a cardiac arrest is not recommended (IIb)
- High dose epinephrine is not recommended for routine use (III)
- Vasopressin offers no advantage as a substitute for epinephrine in cardiac arrest (IIb)
- Use of steroids for CPR in out of hospital (OHCA) is not recommended (IIb)
- In Hospital Cardiac arrest (IHCA), combination use of intra-arrest vasopressin, epinephrine, methylprednisolone and post-arrest hydrocortisone may be considered (IIb)

Reference:

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