Cardiac Arrest Algorithm (Adult or Pediatric)

1. Confirm unresponsiveness and call for assistance
   - Confirm cardiac arrest and begin CPR (C-A-B)
   - Attach cardiac monitor/defibrillator

2. V-Fib or Pulseless V-Tach

3. Shock × 1

4. CPR × 2 minutes
   • IV or IO access

   **Shockable rhythm?**

   **YES**

   5. Shock × 1

   6. CPR × 2 minutes
      • Epinephrine every 3-5 min.
      • Consider advanced airway
      • Waveform capnography

   **Shockable rhythm?**

   **NO**

   **YES**

   7. Shock × 1

   8. CPR × 2 minutes
      • Amiodarone
      • Treat reversible causes

   **Shockable rhythm?**

   **NO**

   **YES**

9. Asystole or PEA

10. CPR × 2 minutes
    • IV or IO access
    • Epinephrine every 3-5 min.
    • Consider advanced airway
    • Waveform capnography

   **Shockable rhythm?**

   **NO**

   **YES**

11. CPR × 2 minutes
    • Treat reversible causes

   **Shockable rhythm?**

   **NO**

   **YES**

   Go to box 5 or 7

12. If no signs of ROSC, go to box 10 or 11
    If ROSC, go to post-cardiac arrest care
**CPR Quality**

- Push hard (at least 2 inches in the adult—at least one third of the anterior–posterior diameter of the chest in infants [about 1½ inches] and children [about 2 inches])—and fast (at least 100/min). Allow full chest recoil in between compressions.
- Switch compressor every 2 minutes. Avoid excessive ventilation. Minimize CPR interruptions.
- Compression-to-ventilation ratio:
  - All adult and single-rescuer CPR: 30:2
  - Two-rescuer infant and child CPR: 15:2
- Begin asynchronous CPR after the advanced airway has been inserted. Use a compression rate of at least 100/min and ventilations at 8 to 10 breaths/min (one breath every 6 to 8 seconds).
  - Waveform capnography
  - If ETCO₂ < 10 mm Hg, attempt to improve CPR quality

**Defibrillation Energy**

**Adult:**
- Biphasic: Manufacturer recommendation (120 to 200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent; higher doses may be considered.
- Monophasic: 360 J.

**Pediatric:**
- First shock at 2 J/kg; second shock at 4 J/kg; subsequent shocks at least 4 J/kg.
- Maximum shock: 10 J/kg or adult energy setting.

**Drug Doses and Intervals**

- Epinephrine:
  - Adult: 1 mg IV/IO every 3–5 minutes
  - Pediatric:
    - IV/IO dose: 0.01 mg/kg (0.1 mL/kg of 1:10,000 solution) every 3 to 5 min
    - ET dose (if no IV or IO): 0.1 mg/kg (0.1 mL/kg of 1:1,000 solution)
- Vasopressin:
  - Adult: 40 units (IV/IO) one time to replace first or second dose of epinephrine
  - Pediatric: not applicable
- Amiodarone:
  - Adult: 300 mg initial dose; 150 mg second dose
  - Pediatric: 5 mg/kg IV or IO; may repeat twice at same dose; maximum of 15 mg/kg

**Advanced Airway**

- Insert supraglottic airway device or endotracheal tube.
- Use quantitative waveform capnography to confirm and monitor ET tube placement.

- Begin asynchronous CPR after the advanced airway has been inserted. Use a compression rate of at least 100/min and ventilations at 8 to 10 breaths/min (one breath every 6 to 8 seconds). Do not hyperventilate!

**Reversible Causes**

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia (especially in infants and children)
- Hypokalemia/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins (drug overdose, poisoning)
- Thrombosis, pulmonary
- Thrombosis, coronary

**Return of Spontaneous Circulation (ROSC)**

- Abrupt and sustained increase in ETCO₂ (typically > 40 mm Hg); palpable pulse.
- Assess BP. Obtain 12-lead ECG. Maintain SpO₂ ≥ 94%.
- Maintain BP with IV/IO fluid bolus or vasopressor.
- Does the patient follow commands?
  - No → Consider induced hypothermia
  - Yes → STEMI or high suspicion of AMI
  - Advanced critical care; coronary reperfusion