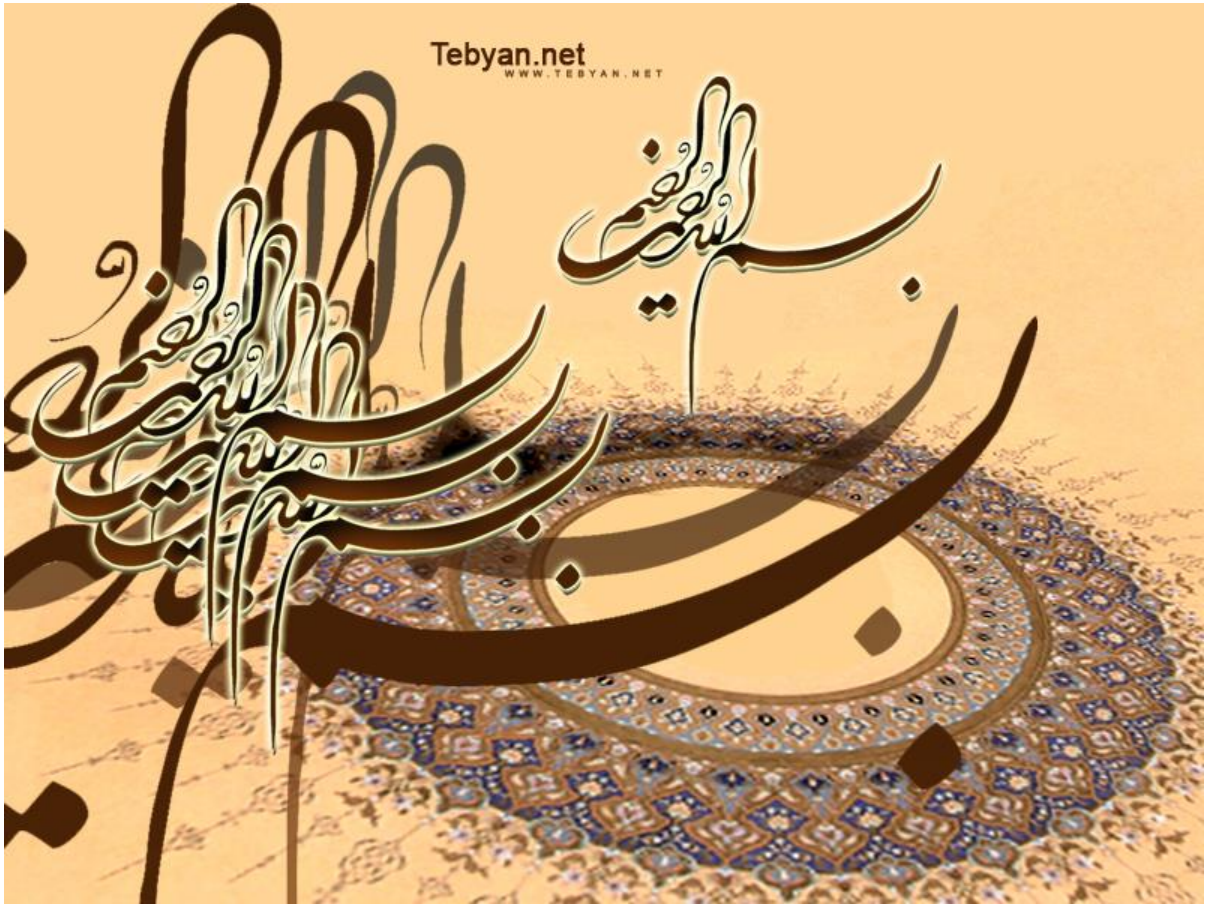

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CPR -DRUGS

GUIDELINE 2021

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EPINEPHRINE

- Decrease perfusion to nonvital org
- Improve coronary perfusion
- Increase intensity of ventricular fibrillation
- Stimulates cardiac contractions
- Intensifies cardiac contractions
- Indications:bradyarrythmia with hemodynamic compromise asystole or pulseless arrest

Epinephrine

- No survival benefit from routine use of high-dose epinephrine
- It may be harmful, particularly in asphyxia.
- High-dose epinephrine may be considered in exceptional circumstances, such as β-blocker overdose.
- 0.01 mg/kg (0.1 ml/kg 1:10 000) IV/IO
- 0.1 mg/kg (0.1 ml/kg 1:1000) ET
- Max dose: 1 mg IV/IO; 10 mg ET
- May repeat q 3–5 min

Epinephrine

- Administer all catecholamines through a secure line, preferably into the central circulation.
- Local ischemia, tissue injury, & ulceration may result from tissue infiltration.
- Do not mix catecholamines with sodium bicarbonate; alkaline solutions inactivate them.
- In patients with a perfusing rhythm, epinephrine causes tachycardia & may cause ventricular ectopy, tachyarrhythmias, HTN, & vasoconstriction.

Glucose

- 0.5-1 g/kg IV/IO
  - D5W: 10-20 ml/kg
  - D10W: 5-10 ml/kg
  - D20W: 2.5-5 ml/kg
  - D25W: 2-4 ml/kg
  - D50W: 1-2 ml/kg

Treat hypoglycemia

- Adult 50% dex 1ml/kg
- Children 25% dex 2ml/kg
- Infants 10% dex 4ml/kg

- Glu administration during & after CPR should be restricted to hypoglycemia

- ▲glu ▲lactic acid ▲acidos ▲ ischemic neurologic injury

Maintain normal serum glu

Atropine INDICATION

1. symptomatic bradycardia with AV node block
2. vagal bradycardia during intubation attempts,
3. after epi for bradycardia with poor perfusion

Atropine

- 0.02 **mg/kg** IV/IO
- 0.03 mg/kg ET
- Repeat once if needed
- Higher doses may be used with organophosphate poisoning
- ~~Min dose: 0.1 mg ???~~
- Max single dose:
  - Child 0.5 mg
  - Adolescent 1 mg

Max total dose :child 1 mg ,adolescent 2 mg

Onset of action 30 s,peak effect 1-2 min after iv

ADENOSINE

- FIRST LINE AFTER VAGAL MANEUVERS fail for supraventricular tachycardia (SVT)in children & adult

- Used to differentiate between VT & SVT(slow conduction,isolated atrial node activity)

Adenosine

- A wide safety margin because of its short half-life(rapid onset 10s,short duration 30s)
- A higher dose may be required for peripheral administration than CV administration.
- May also be given by IO route.
- Follow with a rapid saline flush(10 ml) to promote flow toward the central circulation.
- Monitor ECG
- 0.1 mg/kg (max 6 mg)
- Repeat: 0.2 mg/kg (max 12 mg)

Sodium bicarbonate

- Its routine administration has not been shown to improve outcome of resuscitation.
- For prolonged cardiac arrest after adequate ventilation & chest compressions & administered epinephrine.
- Ensure adequate ventilation when give bicarbonate

Sodium bicarbonate

- During cardiac arrest or severe shock, ABG analysis may not accurately reflect tissue & venous acidosis.
- Idication:metabolic acidosis,hyperk ,long CPR w/o blood gas availability ,B blocker toxicity,pulmonary HT crisis, sodium channel blocker toxicity(tricyclic antidepressant)
- Excessive sodium bicarbonate may impair tissue oxygen delivery; cause hypokalemia, hypocalcemia, hypernatremia, & hyperosmolality; decrease the VF threshold; & impair cardiac function.
- 1 mEq/kg per dose IV/IO slowly(repeat 0.5mEq/kgQ10 min)

Amiodarone

- Supraventricular & ventricular tachyarrhythmia Monitor ECG & BP(more effective than lidocaine ,bretylium for vt ,vf)
- Adjust administration rate to urgency (give more slowly when perfusing rhythm present)
- Use caution when administering with other drugs that prolong QT (consider expert consultation)
- Adverse effects may be long lasting because the half-life is up to 40 days.
- 5 mg/kg(over30min,push if pulseless), IV/IO; repeat up to 15 mg/kg
- Max: 300 mg

Amiodarone

- can cause thrombophlebitis when injected into a peripheral vein
- should be delivered via a central vein. If central venous access is unavailable (likely at the time of cardiac arrest)
- given peripherally, flush it liberally with 0.9% sodium chloride or 5% glucose.

Calcium Chloride (10%)

- Routine use does not improve outcome of cardiac arrest.
- Indicated:1.hypocalcemia 2. ca channel blocker toxicity3.hyper K&MG,
- In critically ill children, calcium chloride may provide greater bioavailability than calcium gluconate.
- Preferably administer calcium chloride via a CV catheter because of the risk of sclerosis or infiltration with a peripheral venous line(slowly).
- 20 mg/kg IV/IO (0.2 ml/kg)
- Adult dose: 5–10 ml

lidocaine

- Ventricular arrhythmias
- Supress ventricular ectopy
- Raise threshold for fibrillation

Lidocaine

- Toxicity includes myocardial & circulatory depression, drowsiness, disorientation, muscle twitching, & seizures, esp. in patients with poor CO & hepatic or renal failure.
- Bolus: 1 mg/kg IV/IO
- Max dose: 100 mg
- Infusion: 20–50 µg/kg/min(reduce dose in low cardiac output or liver failure)
- ET: 2–3 mg

Magnesium Sulfate

- Routine use during cardiac arrest?
- Indicated for the Rx. of documented **hypomagnesemia** or for **torsades de pointes** (polymorphic VT).
- Produces vasodilation & may cause hypotension if administered rapidly.
- **25–50 mg/kg IV/IO over 10–20 min; faster in torsades**
- **Max dose: 2g**

Naloxone

- RESPIRATORY DEPRESSION

  0.001-0.005 mg/kg max dose :0.1 mg -IV/IM/IO/ET/SUBQ

- FULL REVERSAL :0.1 mg/kg max 2mg

Procainamide

- Treat ventricular arrhythmias(VT),
- Monitor ECG & BP
- Use caution when administering with other drugs that prolong QT (consider expert consultation)
- Stop the infusion if the QRS widens to > 50% of baseline or if hypotension develops.
- 15 mg/kg IV/IO over 30–60 min
- Adult dose: 20 mg/min IV infusion up to total max dose 17 mg/kg

fluids in CPR

- Hypovolaemia : reversible cause of cardiac arrest.
- give IV or IO fluids rapidly (10 mL kg^{-1} boluses).
- use balanced crystalloids or 0.9% saline for initial volume resuscitation; in serious injury blood and blood products may be indicated.
- Do not use dextrose-based solutions for volume replacement –redistributed rapidly away from the intravascular space cause hyponatraemia & hyperglycaemia, worsen neurological outcome

Recommendations for Weight-Based Dosing of Resuscitation Medications		
COR	**LOE**	**Recommendations**
1	C-EO	1. For resuscitation medication dosing, it is recommended to use the child's body weight to calculate resuscitation drug doses while not exceeding the recommended dose for adults.[27–31]
2b	B-NR	2. When possible, inclusion of body habitus or anthropomorphic measurements may improve the accuracy of length-based estimated weight.[8]
2b	C-LD	3. If the child's weight is unknown, a body length tape for estimating weight and other cognitive aids to calculate resuscitation drug dosing and administration may be considered.[29,32,33]

Pediatric drug dosage

- Use the child/infant's body weight for drug calculations if known.
- Use a body length tape with pre-calculated drug doses.
- Use a pediatric emergency drug chart.
- Use an age-based weight calculation formula
  (weight in kg = (age in years + 4) x 2) up to age 10 years.
- For obese patients use ideal body weight and do not use
actual weight to avoid drug toxicity.
- Beware of exceeding the adult doses of drugs and fluids in older children

Recommendations for Drug Administration During Cardiac Arrest		
COR	**LOE**	**Recommendations**
2a	C-LD	1. For pediatric patients in any setting, it is reasonable to administer epinephrine. IV/IO is preferable to endotracheal tube (ETT) administration.[2,9–11]
2a	C-LD	2. For pediatric patients in any setting, it is reasonable to administer the initial dose of epinephrine within 5 min from the start of chest compressions.[12–16]
2a	C-LD	3. For pediatric patients in any setting, it is reasonable to administer epinephrine every 3–5 min until ROSC is achieved.[17,18]
2b	C-LD	4. For shock-refractory VF/pVT, either amiodarone or lidocaine may be used.[19,20]
3: Harm	B-NR	5. Routine administration of sodium bicarbonate is not recommended in pediatric cardiac arrest in the absence of hyperkalemia or sodium channel blocker (eg, tricyclic antidepressant) toxicity.[5–7,21–25]
3: Harm	B-NR	6. Routine calcium administration is not recommended for pediatric cardiac arrest in the absence of documented hypocalcemia, calcium channel blocker overdose, hypermagnesemia, or hyperkalemia.[3,4,23]