

CPR 2022

احیاء قلبی ریوی در بزرگسالان



ده نکته مهم در مورد احیاء که نیاز به توجه ویژه دارد

1. به محض تشخیص ایست قلبی فرد حاضر بر بالین باید کد احیاء و عملیات احیاء را همزمان آغاز کند.
2. احیاء با کیفیت شامل سه نکته کلیدی است . عمق و تعداد کافی ماساژها و حداقل دفعات توقف در CPR
3. در VF/VT دو نکته حیاتی است : دفیبریلاسیون در اسرع وقت و احیاء با کیفیت
4. تجویز اپی نفرین بخصوص در مواردی که شوک بیفایده است در بقاء موثر میباشد
5. همه ایستهای قلبی یکسان نیستند و اقدامات تخصصی در بسیاری از موارد لازم است
6. اعتیاد به مواد مخدر در دنیا تبدیل به اپیدمی شده است
7. مراقبت بعد از احیاء بخش مهمی از زنجیره بقاء بیمار است و نیاز به یک سیستم هماهنگ و چند تخصصی و ساختارمند دارد.
8. پس از برقراری گردش خون اگر بیمار در کما بود باید بلافاصله دمای بدن بیمار مدیریت شود.
9. در بیمارانی که زنده مانده و مغز آسیب دیده ارزیابی نورولوژیک الزامی است.
10. برای برگشت بیماران به زندگی عادی وجود برنامه هایی برای بازتوانی و درمانهای بعدی حیاتی است.

گزیده ای از آمار

- در موارد OHCA 10.4% زنده میمانند و 8.2% عملکرد خوب خواهند داشت که این آمار از سال 2012 تغییر نکرده است.
- در بیماران بستری حدود 1.2% دچار ایست قلبی-تنفسی میشوند و 25.8% زنده مانده و ترخیص میشوند.
- مهمترین عوامل موثر در زنده ماندن در موارد OHCA وجود AED در مکانهای عمومی و حضور فردی مسلط به احیاء بر بالین بیمار است.

چه کسانی توانایی انجام CPR را دارند؟

EVEN CHILDREN CAN PERFORM SUCCESSFUL CPR

- A recent study tested sixth graders and their capacity to use Hands-Only CPR to save lives. *The study found that the majority of children could perform CPR in the correct location and at the appropriate compression rate*, making this a viable group to train to help save lives



2 STEPS TO SAVE A LIFE



SCOPE OF GUIDELINES

اهمیت زمان در فرآیند BLS

جهت حصول نتیجه خوب در احیاء سه جزء زیر حیاتی است:

1. استفاده از گایدلاینهای منطبق بر علم و تحقیقات با کیفیت
2. آموزش موثر کادر درمان و عامه مردم
3. اعمال یک فلوچارت بر مبنای chain of survival

پنج نکته حیاتی در احیاء

1. تشخیص سریع
2. CPR بلادرنگ
3. شوک در اسرع وقت در موارد لازم
4. مراقبت پس از احیاء
5. بر طرف کردن عامل زمینه ای

• شایعترین علت قلبی است : MI و سایر علل الکتریکال قلبی

• علل غیر قلبی :

• نارسایی تنفسی

• مسمومیت

• آمبولی

• غرق شدن

• مخدر

علل ایست قلبی
تنفسی

- Resuscitation causes, processes, and outcomes are **very different for OHCA and IHCA**, which are reflected in their respective Chains of Survival
- In OHCA, the care of the victim depends on community engagement and response.
- It is critical for community members to recognize cardiac arrest, phone 115 , perform CPR, and use an AED

CHAIN OF SURVIVAL

Pre CPR

CPR

Post CPR



Adult IHCA Chain of Survival

PRE CPR

- 1. From an acute and progressive vital organ dysfunction to **ARREST**
- 2. Detect organ failure by target monitoring
- 3. TRACK and TRIGGER
- 4. Crash Card
- 5. Acceptable , Warning , Action Ranges for monitoring
- 6. Ward oriented

• در مرحله warning مقادیر بدست آمده از مونیتورینگ در محدوده قابل قبول نیست و باید به پزشک اطلاع رسانی شود



BLS

BASIC LIFE SUPPORT

تشخیص ایست قلبی

- اگر بیمار هشیار نیست و تنفس gasping دارد به معنی ایست قلبی است
 - اگر کادر درمان حاضر بودند میتوان نبض را چک کرد :
1. حداکثر فقط 10 ثانیه

2. در صورت نبود نبض واضح فرض بر ایست قلبی است

نکته مهم : منافع احیاء بیمار دچار ایست قلبی بسیار بیشتر از ماساژ
بیماری است که هشیار نبوده ولی ایست قلبی نکرده

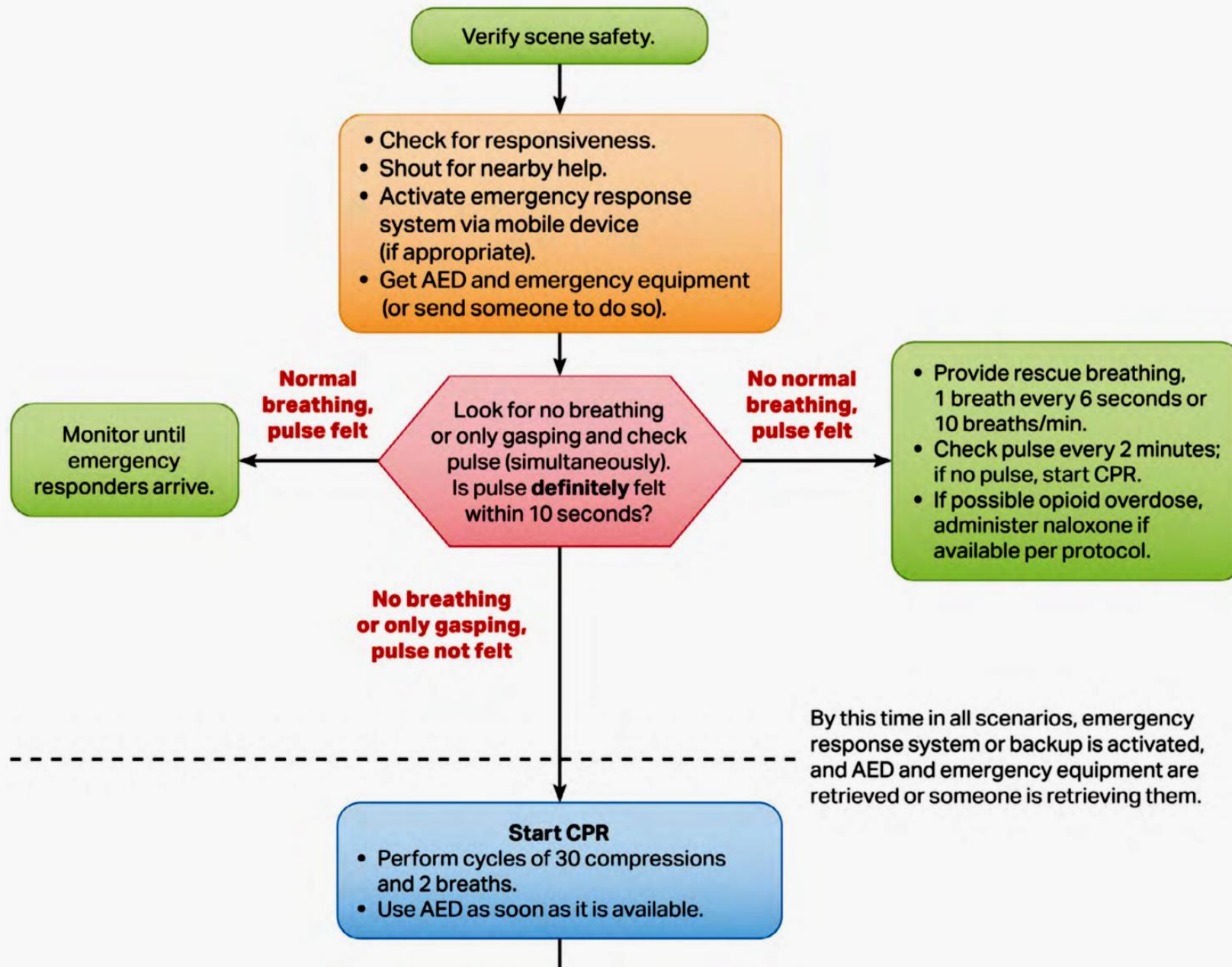
What is Cardiac Arrest?

Occurs when the heart malfunctions and stops beating unexpectedly. Cardiac arrest is an “ELECTRICAL” problem.

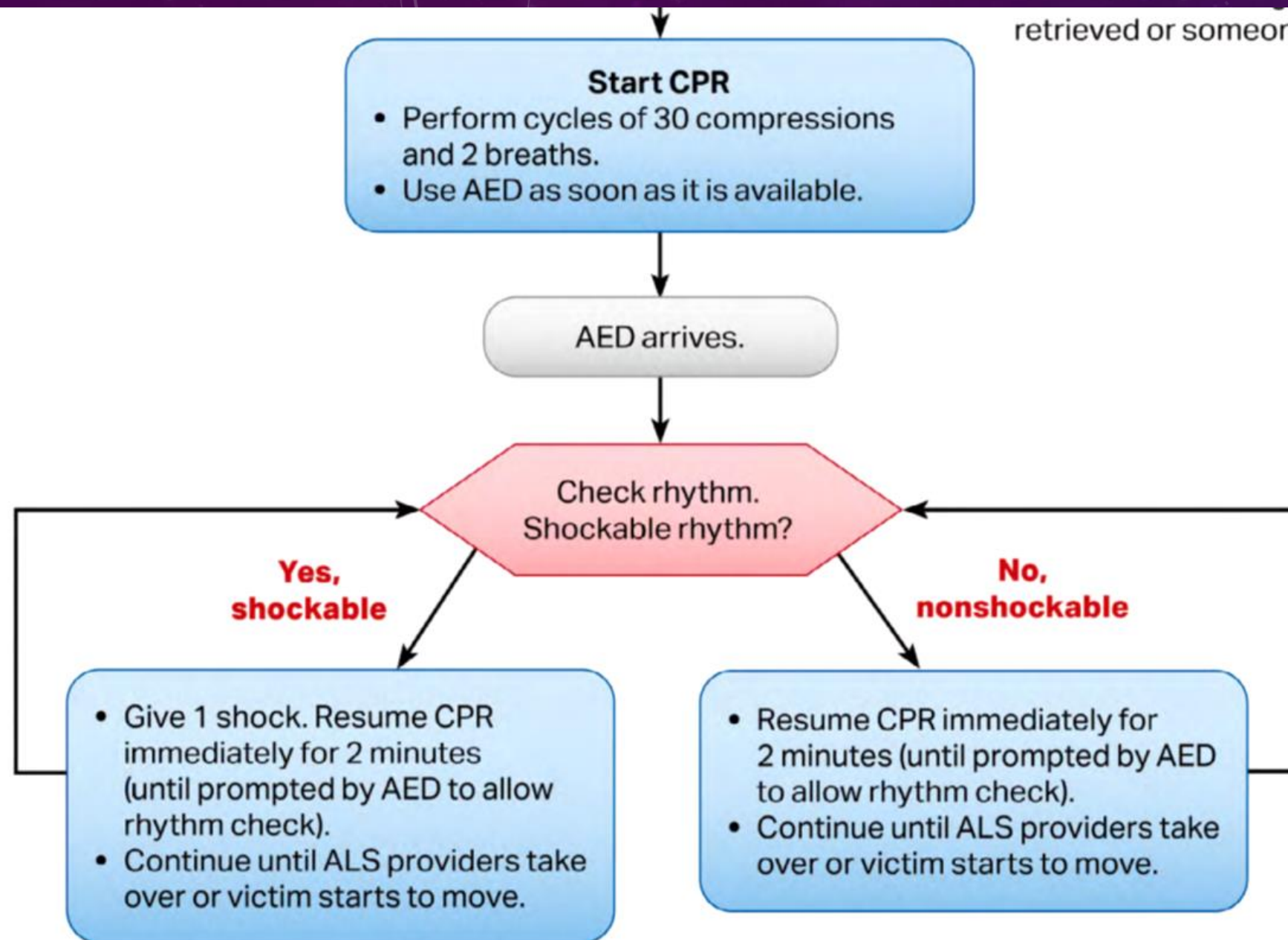
What is a Heart Attack?

Occurs when blood flow to the heart is blocked. A heart attack is a “CIRCULATION” problem.

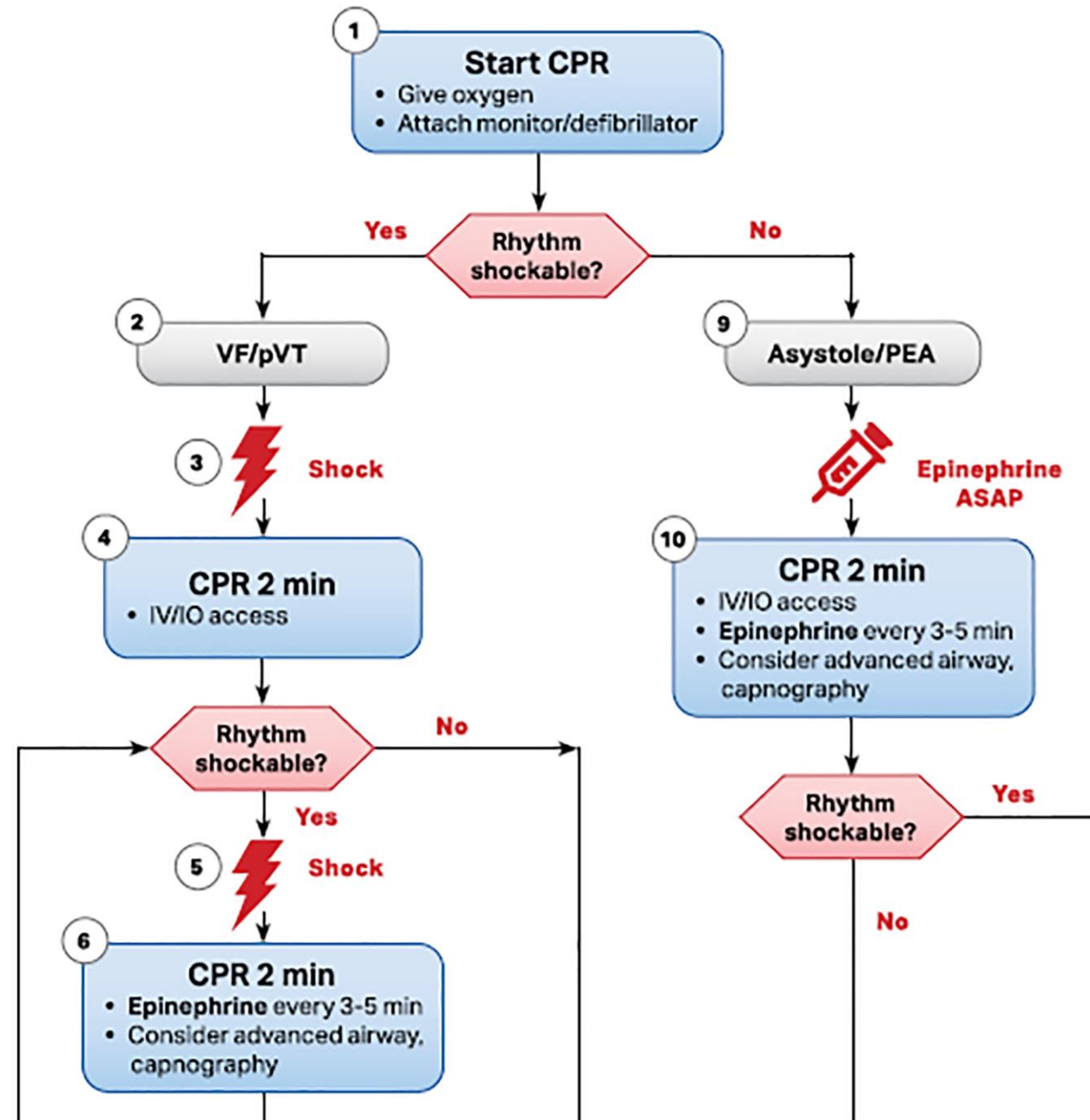
Adult Basic Life Support Algorithm for Healthcare Providers

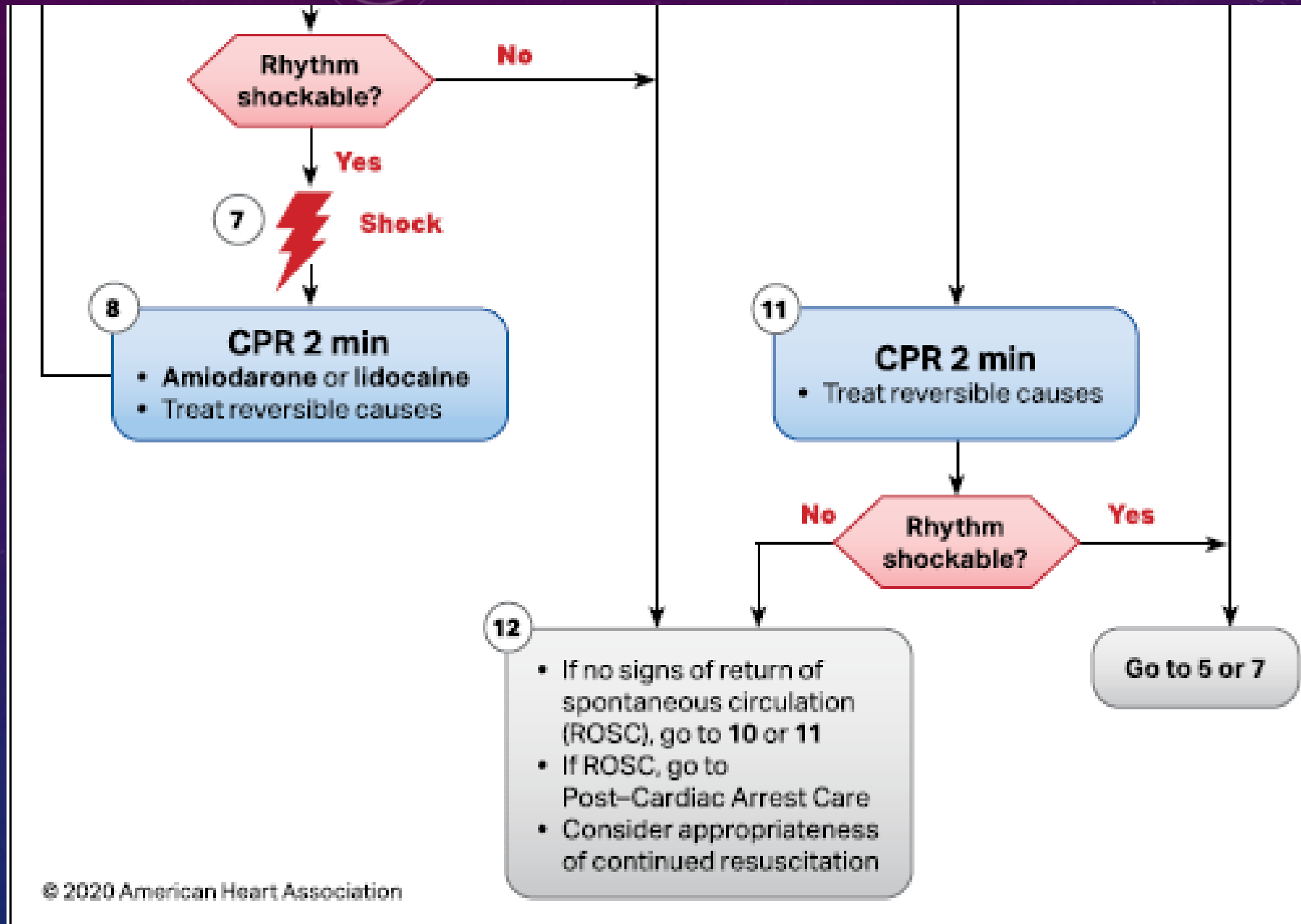


retrieved or someone is retrieving them.

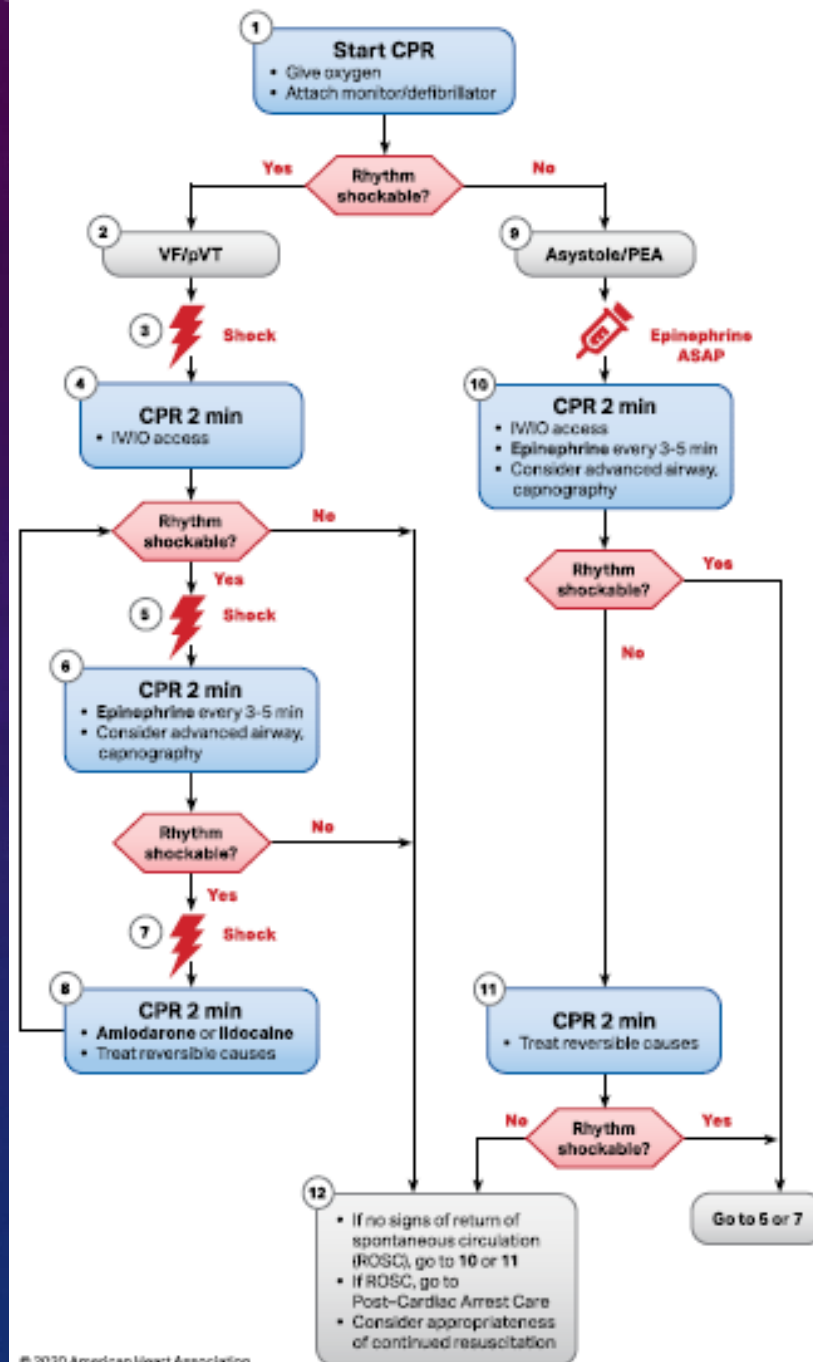


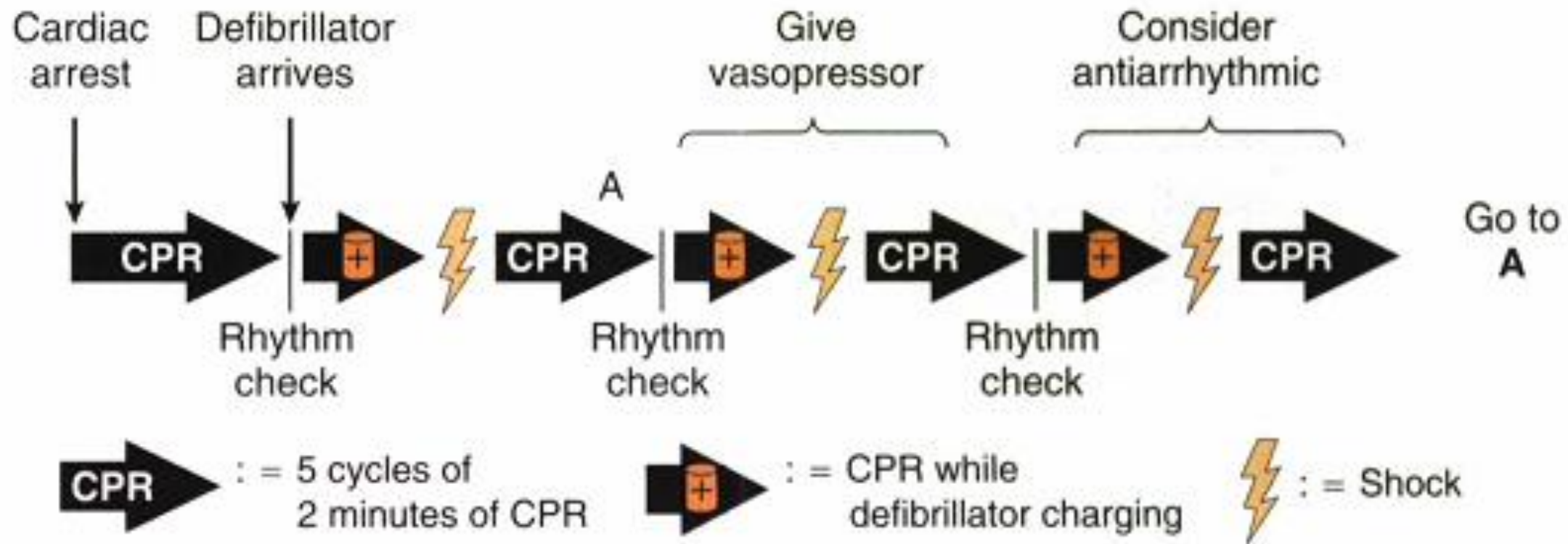
Adult Cardiac Arrest Algorithm





Adult Cardiac Arrest Algorithm





CPR Quality

- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
 - If PETCO₂ is low or decreasing, reassess CPR quality.

• احیاء با کیفیت :

- 1. حداقل 5 سانتیمتر
- 2. 100 تا 120 ماساژ
- 3. خودداری از توقف ماساژ
- 4. خودداری از هیپرونتیلیسیون
- 5. جابجایی فرد ماساژ دهنده هر دو دقیقه
- 6. قبل از انتوباسیون نسبت ماساژ به تنفس :
30/2
- 7. کاپنوگرافی

Shock Energy for Defibrillation

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

Drug Therapy

- **Epinephrine IV/IO dose:**
1 mg every 3-5 minutes
- **Amiodarone IV/IO dose:**
First dose: 300 mg bolus.
Second dose: 150 mg.
or
Lidocaine IV/IO dose:
First dose: 1-1.5 mg/kg.
Second dose: 0.5-0.75 mg/kg.

داروی طلایی
احیاء
EPINEPHRINE

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

نکات مهم تنفس:

1. لوله تراشه یا SGA

2. کاپنوگرافی

دو مزیت:

مونیتورینگ احیاء

مونیتورینگ لوله تراشه

3. خودداری از هیپرونتیلیسیون

هر 6 ثانیه یک تنفس

ROSC

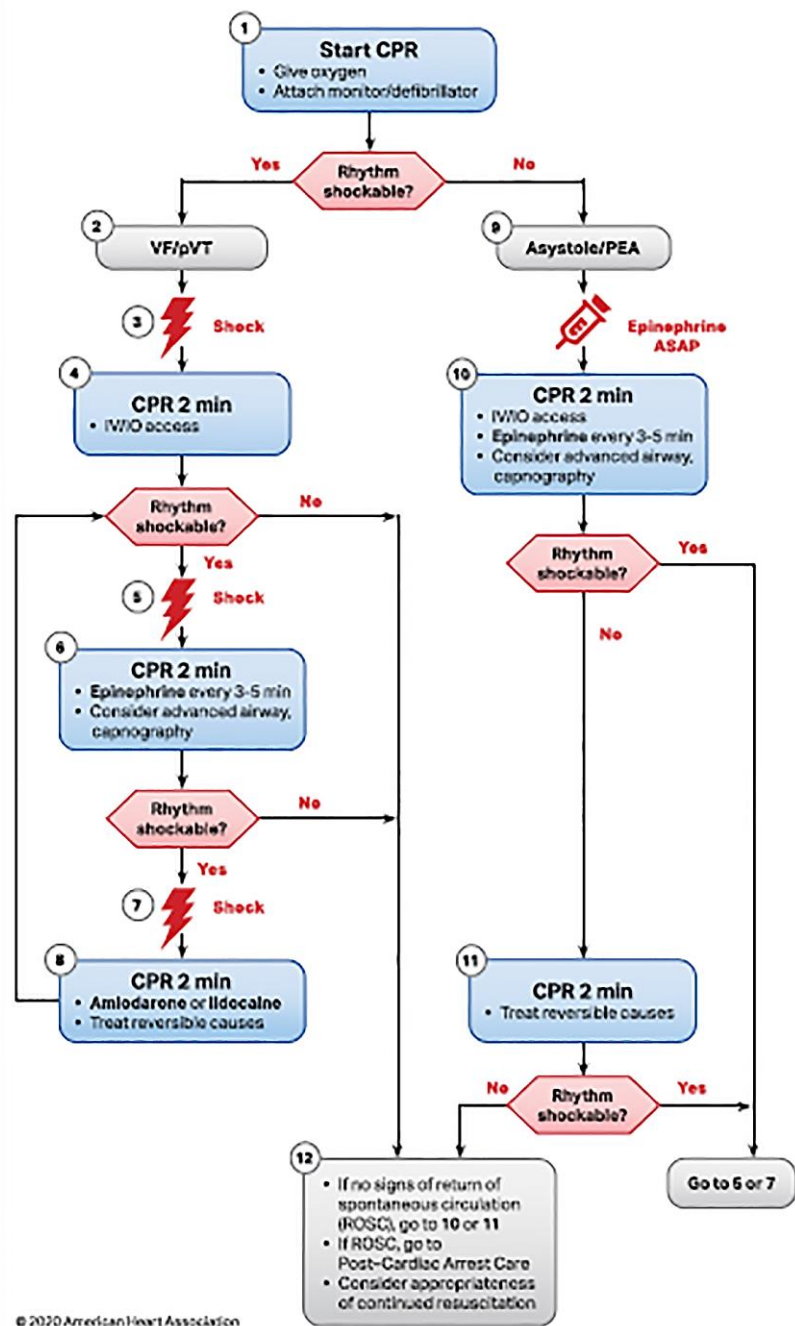
بازگشت گردش خون

- Pulse and blood pressure
- Abrupt sustained increase in PETCO₂ (typically ≥ 40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

علل برگشت پذیر ایست قلبی

- **Hypovolemia**
- **Hypoxia**
- **Hydrogen ion (acidosis)**
- **Hypo-/hyperkalemia**
- **Hypothermia**
- **Tension pneumothorax**
- **Tamponade, cardiac**
- **Toxins**
- **Thrombosis, pulmonary**
- **Thrombosis, coronary**

Adult Cardiac Arrest Algorithm



CPR Quality

- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressor every 2 minutes, or sooner if fatigued.
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- Biphasic: Manufacturer recommendation (eg, initial dose of 120-200 J; if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- Monophasic: 360 J

Drug Therapy

- Epinephrine (I/W/O) dose: 1 mg every 3-5 minutes
- Amiodarone (I/W/O) dose: First dose: 300 mg bolus. Second dose: 150 mg.
- Lidocaine (I/W/O) dose: First dose: 1-1.5 mg/kg. Second dose: 0.5-0.75 mg/kg.

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- Endotracheal intubation or supraglottic advanced airway
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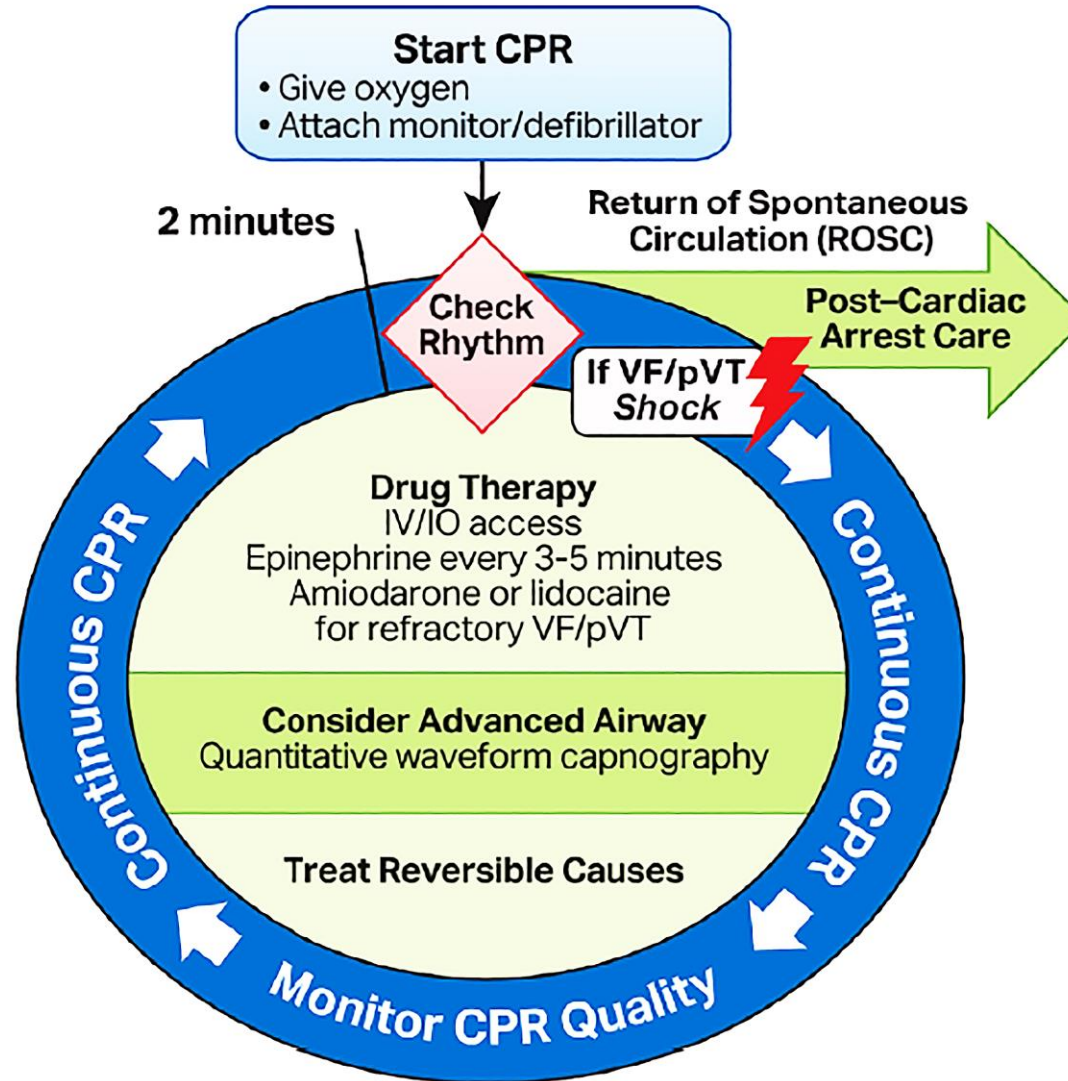
Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in PETCO₂, typically >40 mm Hg
- Spontaneous arterial pressure waves with intra-arterial monitoring

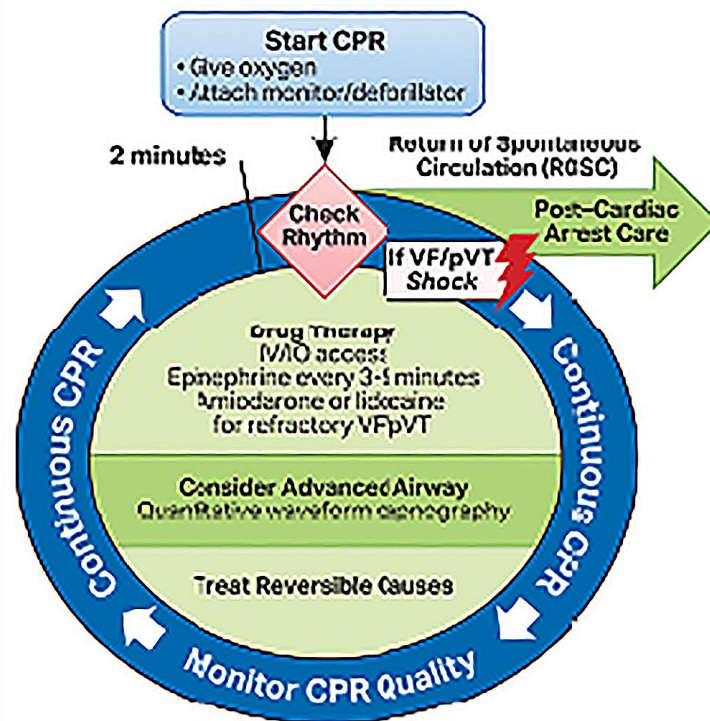
Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

Adult Cardiac Arrest Circular Algorithm



Adult Cardiac Arrest Circular Algorithm



CPR Quality

- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
 - If PETCO₂ is low or decreasing, reassess CPR quality.

Shock Energy for Defibrillation

- Biphasic: Manufacturer recommendation (e.g. initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- Monophasic: 360 J

Drug Therapy

- Epinephrine IV/IO dose: 1 mg every 3-5 minutes
- Amiodarone IV/IO dose: First dose: 300 mg bolus. Second dose: 150 mg.
- or
- Lidocaine IV/IO dose: First dose: 1-1.5 mg/kg. Second dose: 0.5-0.75 mg/kg.

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Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in PETCO₂ (typically ≥ 40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes

- | | |
|---------------------------|-------------------------|
| • Hypovolemia | • Tension pneumothorax |
| • Hypoxia | • Tamponade, cardiac |
| • Hydrogen ion (acidosis) | • Toxins |
| • Hypo-/hyperkalemia | • Thrombosis, pulmonary |
| • Hypothermia | • Thrombosis, coronary |

Table 2. Adult BLS Sequence²²

Step	Lay Rescuer Not Trained	Lay Rescuer Trained	Healthcare Provider
1	Ensure scene safety.	Ensure scene safety.	Ensure scene safety.
2	Check for response.	Check for response.	Check for response.
3	Shout for nearby help. Phone or ask someone to phone 9-1-1 (the phone or caller with the phone remains at the victim's side, with the phone on speaker mode).	Shout for nearby help and activate the emergency response system (9-1-1, emergency response). If someone responds, ensure that the phone is at the side of the victim if at all possible.	Shout for nearby help/activate the resuscitation team; the provider can activate the resuscitation team at this time or after checking for breathing and pulse.

4	Follow the telecommunicator's* instructions.	Check for no breathing or only gasping; if none, begin CPR with compressions.	Check for no breathing or only gasping and check pulse (ideally simultaneously). Activation and retrieval of the AED/emergency equipment by the lone healthcare provider or by the second person sent by the rescuer must occur no later than immediately after the check for no normal breathing and no pulse identifies cardiac arrest.
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5	Look for no breathing or only gasping, at the direction of the telecommunicator.	Answer the telecommunicator's questions, and follow the telecommunicator's instructions.	Immediately begin CPR, and use the AED/defibrillator when available.
6	Follow the telecommunicator's instructions.	Send the second person to retrieve an AED, if one is available.	When the second rescuer arrives, provide 2-rescuer CPR and use the AED/defibrillator.

AED indicates automated external defibrillator; BLS, basic life support; and CPR, cardiopulmonary resuscitation.

AIRWAY

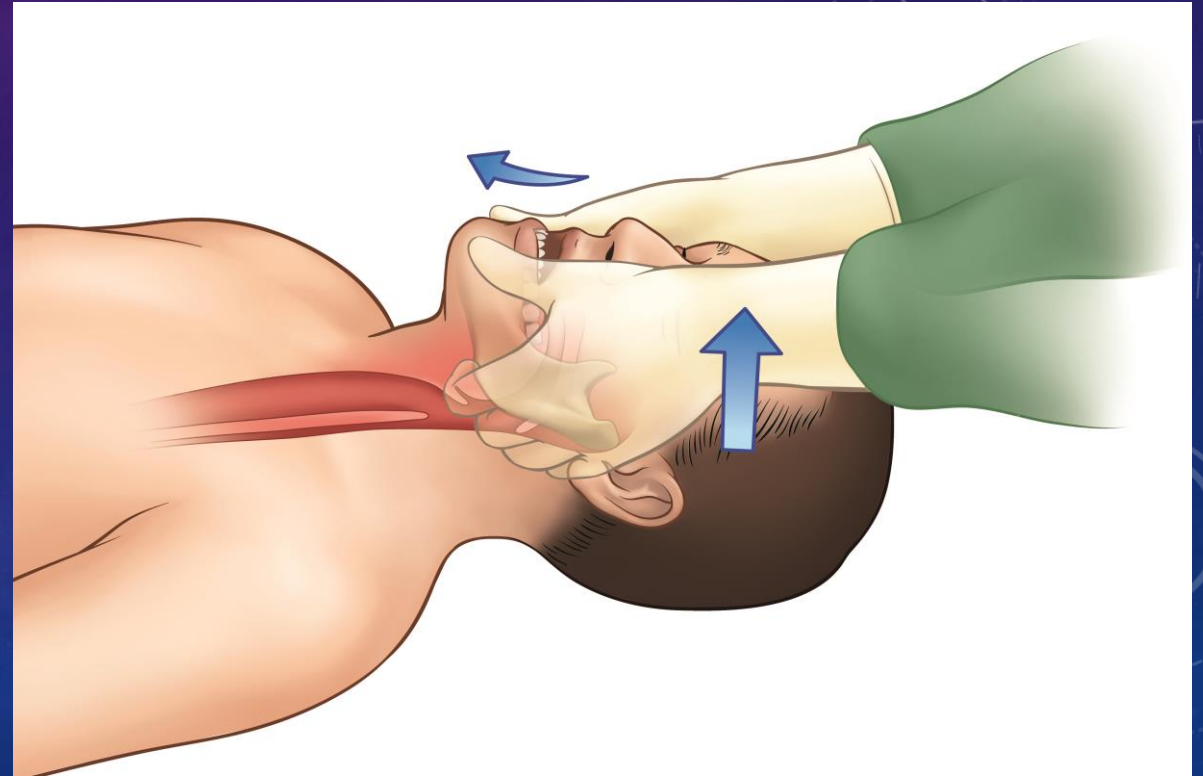
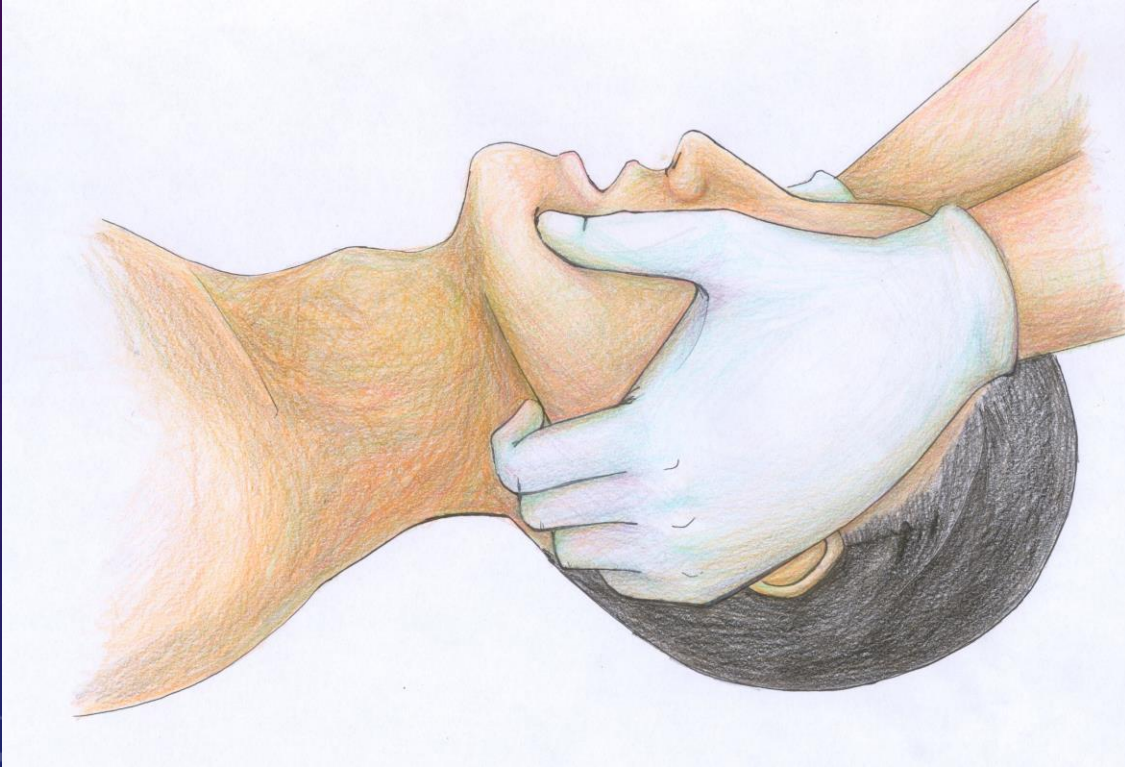
OPENING THE AIRWAY

Recommendations for Opening the Airway		
COR	LOE	Recommendations
1	C-EO	1. A healthcare provider should use the head tilt–chin lift maneuver to open the airway of a patient when no cervical spine injury is suspected.
1	C-EO	2. The trained lay rescuer who feels confident in performing both compressions and ventilation should open the airway using a head tilt–chin lift maneuver when no cervical spine injury is suspected.
2b	C-EO	3. The use of an airway adjunct (eg, oropharyngeal and/or nasopharyngeal airway) may be reasonable in unconscious (unresponsive) patients with no cough or gag reflex to facilitate delivery of ventilation with a bag-mask device.
2a	C-EO	4. In the presence of known or suspected basal skull fracture or severe coagulopathy, an oral airway is preferred compared with a nasopharyngeal airway.
3: No Benefit	C-LD	5. The routine use of cricoid pressure in adult cardiac arrest is not recommended.

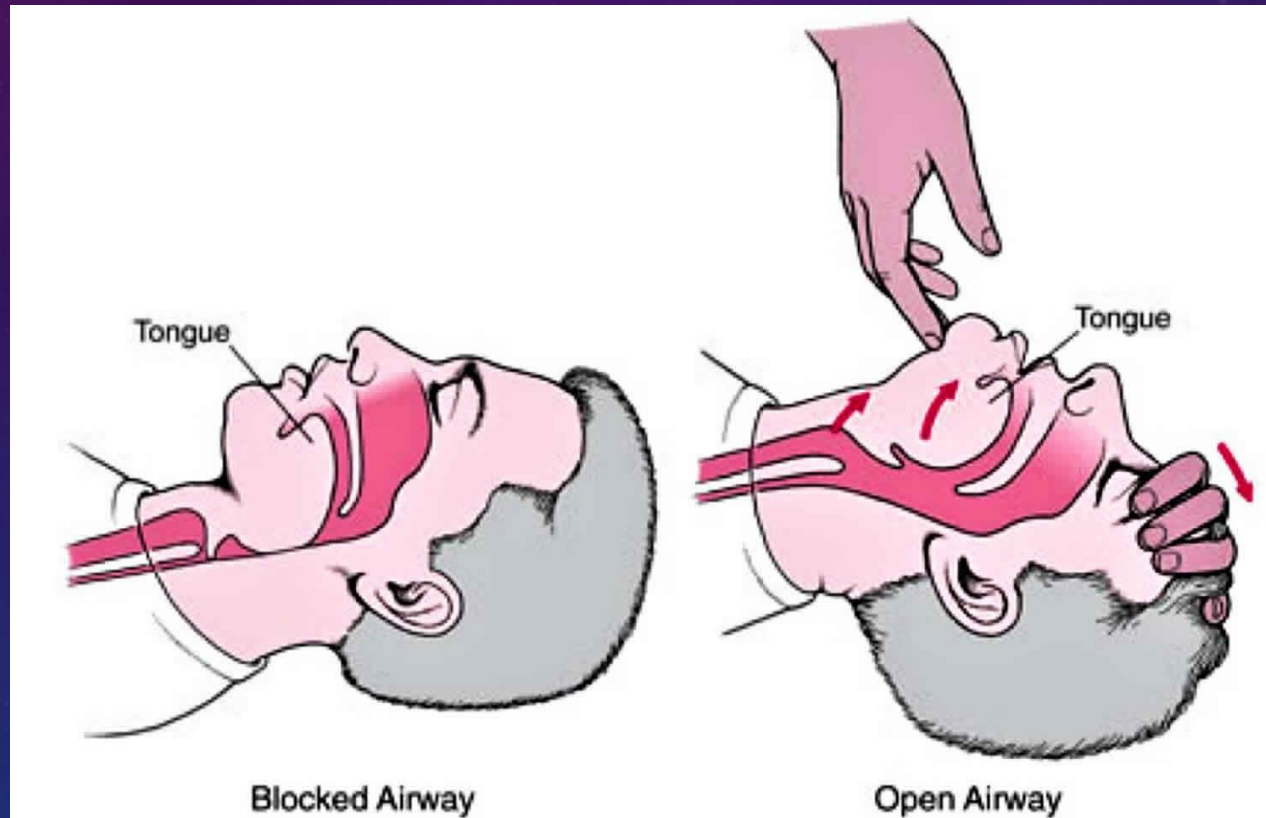
1. Cervical spine injury ?
2. No injury : Head tilt / chin lift
3. Injury : Jaw thrust
4. No cricoid pressure

اگر امکان تنفس دادن به بیمار نبود حتی اگر
ترومای سر و گردن داشت میتوان از **Head**
tilt chin lift استفاده کرد

JAW THRUST MANEUVER



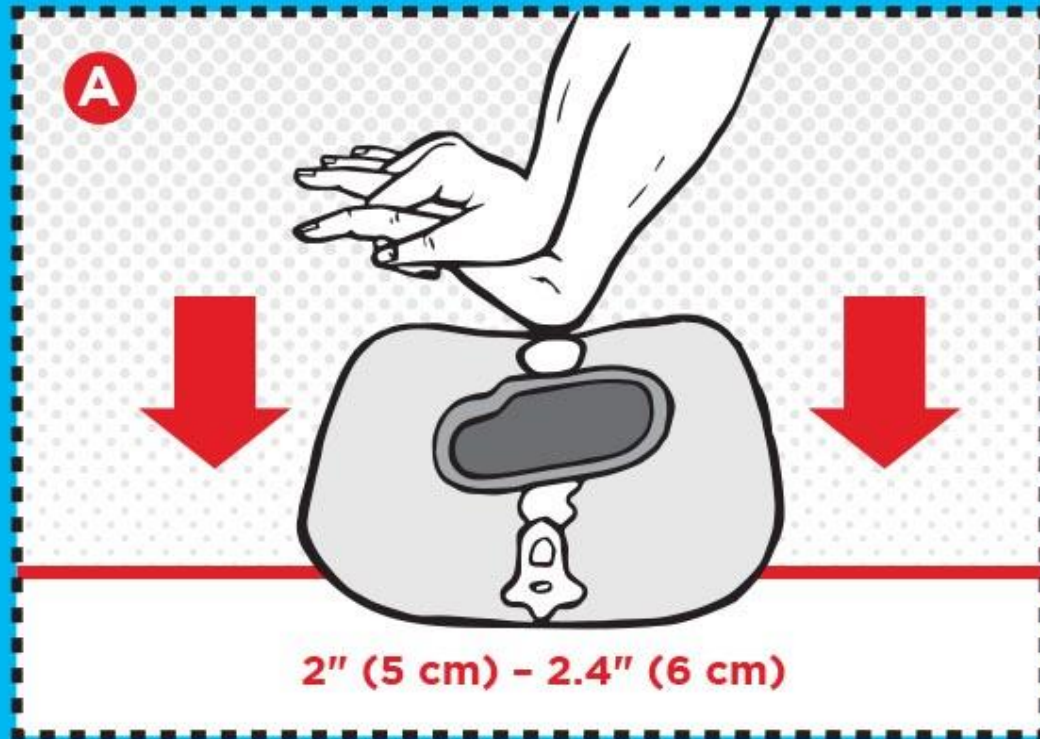
HEAD TILT CHIN LIFT MANEUVER



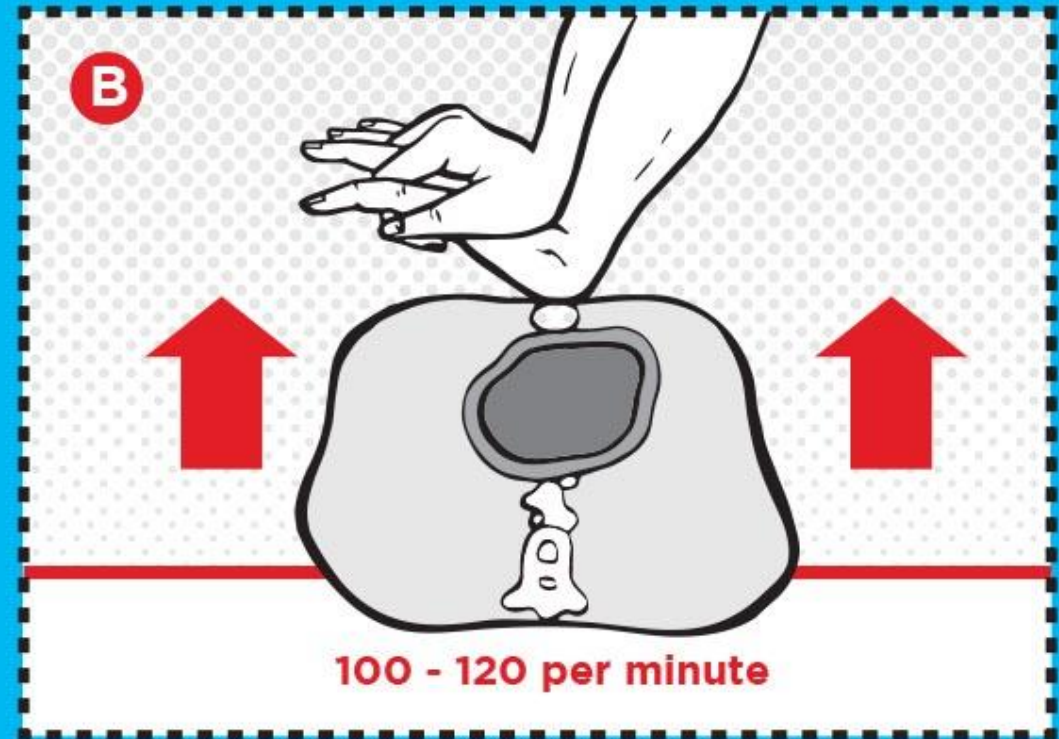
ماساژ قلبی



Recommendations for Positioning and Location for CPR		
COR	LOE	Recommendations
1	C-LD	1. When providing chest compressions, the rescuer should place the heel of one hand on the center (middle) of the victim's chest (the lower half of the sternum) and the heel of the other hand on top of the first so that the hands are overlapped.
1	C-EO	2. Resuscitation should generally be conducted where the victim is found, as long as high-quality CPR can be administered safely and effectively in that location.
2a	C-LD	3. It is preferred to perform CPR on a firm surface and with the victim in the supine position, when feasible.
2b	C-LD	4. When the victim cannot be placed in the supine position, it may be reasonable for rescuers to provide CPR with the victim in the prone position, particularly in hospitalized patients with an advanced airway in place.



CHEST COMPRESSIONS:
**At least 2" (5 cm) and
not more than 2.4" (6 cm)**



COMPRESSION RATE:
**Between 100 and 120
compressions per minute**

COMPRESSION FRACTION AND PAUSES

1. حتی المقدور از توقف در ماساژ خودداری گردد.
2. برای کنترل نبض فقط 10 ثانیه صرف شود.
3. اگر بیش از دو نفر احیاء انجام میدادند میتوان هر 2 دقیقه جابجا شوند :
هر 5 سیکل ماساژ و تنفس با نسبت 30/2
4. بعد از شوک بلافاصله ماساژ شروع شود و زمان برای کنترل ریتم تلف نشود
5. هر تنفس در یک ثانیه داده شود.

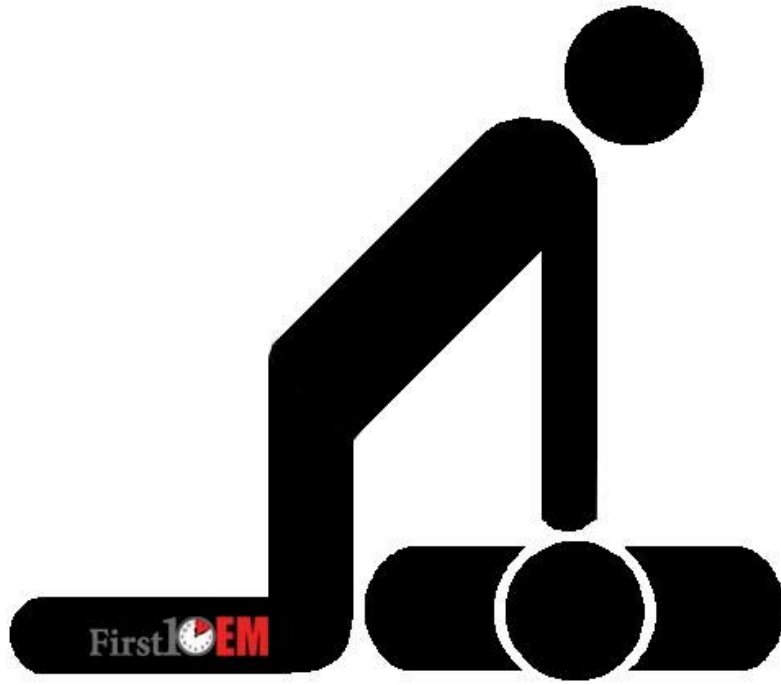
Chest Compression Fraction : 60%

Recommendations for Compression Depth and Rate

COR	LOE	Recommendations
1	B-NR	1. During manual CPR, rescuers should perform chest compressions to a depth of at least 2 inches, or 5 cm, for an average adult while avoiding excessive chest compression depths (greater than 2.4 inches, or 6 cm).
2a	B-NR	2. In adult victims of cardiac arrest, it is reasonable for rescuers to perform chest compressions at a rate of 100 to 120/min.
2a	C-LD	3. It can be beneficial for rescuers to avoid leaning on the chest between compressions to allow complete chest wall recoil for adults in cardiac arrest.
2b	C-EO	4. It may be reasonable to perform chest compressions so that chest compression and recoil/relaxation times are approximately equal.

1. Depths 5 cm
2. No more than 6 cm
3. Rate 100 – 120
4. Avoid leaning
5. Equal times C/R
6. Duty Cycle 50%

**Not too fast;
Not too hard**



**100-120/min
5-6cm deep**

FirstAIDEM

MONITORING

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.

1. EtCO₂
>10 the higher the better
2. Diastolic blood pressure
3. Arterial line
4. Audio feedback

VENTILATION AND VENTILATION TO COMPRESSION RATIO

Recommendations for Fundamentals of Ventilation During Cardiac Arrest		
COR	LOE	Recommendations
2a	C-LD	1. For adults in cardiac arrest receiving ventilation, tidal volumes of approximately 500 to 600 mL, or enough to produce visible chest rise, are reasonable.
2a	C-EO	2. In patients without an advanced airway, it is reasonable to deliver breaths either by mouth or by using bag-mask ventilation.
2b	C-EO	3. When providing rescue breaths, it may be reasonable to give 1 breath over 1 s, take a "regular" (not deep) breath, and give a second rescue breath over 1 s.
3: Harm	C-LD	4. Rescuers should avoid excessive ventilation (too many breaths or too large a volume) during CPR.

EXCESSIVE VENTILATION

تهویه بیش از حد دارای عوارض زیر
است :

ورود هوا به معده
آسپیراسیون
افزایش فشار داخل توراکس
کاهش بازگست وریدی به قلب
کاهش برون ده قلبی
کاهش سوروایوال و بقاء

Recommendations for Compression-to-Ventilation Ratio: ALS		
COR	LOE	Recommendations
2a	B-R	1. Before placement of an advanced airway (supraglottic airway or tracheal tube), it is reasonable for healthcare providers to perform CPR with cycles of 30 compressions and 2 breaths.
2b	B-R	2. It may be reasonable for EMS providers to use a rate of 10 breaths per minute (1 breath every 6 s) to provide asynchronous ventilation during continuous chest compressions before placement of an advanced airway.
2b	C-LD	3. If an advanced airway is in place, it may be reasonable for the provider to deliver 1 breath every 6 s (10 breaths/min) while continuous chest compressions are being performed.
2b	C-LD	4. It may be reasonable to initially use minimally interrupted chest compressions (ie, delayed ventilation) for witnessed shockable OHCA as part of a bundle of care.

DEFIBRILLATION

Recommendations for Defibrillation Indication, Type, and Energy		
COR	LOE	Recommendations
1	B-NR	1. Defibrillators (using biphasic or monophasic waveforms) are recommended to treat tachyarrhythmias requiring a shock.
2a	B-R	2. Based on their greater success in arrhythmia termination, defibrillators using biphasic waveforms are preferred over monophasic defibrillators for treatment of tachyarrhythmias.
2a	B-NR	3. A single shock strategy is reasonable in preference to stacked shocks for defibrillation in the setting of unmonitored cardiac arrest.
2a	C-LD	4. It is reasonable that selection of fixed versus escalating energy levels for subsequent shocks for presumed shock-refractory arrhythmias be based on the specific manufacturer's instructions for that waveform. If this is not known, defibrillation at the maximal dose may be considered.
2b	B-R	5. If using a defibrillator capable of escalating energies, higher energy for second and subsequent shocks may be considered for presumed shock-refractory arrhythmias.
2b	C-LD	6. In the absence of conclusive evidence that one biphasic waveform is superior to another in termination of VF, it is reasonable to use the manufacturer's recommended energy dose for the first shock. If this is not known, defibrillation at the maximal dose may be considered.

در موارد VF/VT هر چه سریعتر شوک داده شود موثرتر است.

حداکثر انرژی که دستگاه ارایه میکند داده شود

Double shocks مقبول نیست

بعد از شوک بلافاصله ماساژ آغاز شود

- در بیمارستان دفیبریلاتور دستی ارجح است زیرا جهت استفاده از دستگاه اتوماتیک نیاز به وقفه طولانی تر در ماساژ قلبی میباشد تا ریتم را تشخیص دهد.

- دفیبریلاتور بایفازیک نسبت به منوفازیک دارای مزایای زیر است:

- 1. امن تر است زیرا انرژی کمتری به بیمار منتقل میکند

- 2. در درمان VF/VT موثر تر است

Recommendations for CPR Before Defibrillation		
COR	LOE	Recommendations
1	C-LD	1. CPR is recommended until a defibrillator or AED is applied.
2a	B-R	2. In unmonitored cardiac arrest, it is reasonable to provide a brief prescribed period of CPR while a defibrillator is being obtained and readied for use before initial rhythm analysis and possible defibrillation.
2a	C-LD	3. Immediate defibrillation is reasonable for provider-witnessed or monitored VF/pVT of short duration when a defibrillator is already applied or immediately available.

روشهای متفرقه

- Pacemaker
- Cough CPR
- Precordial thump
- Percussion pacing
- Fist pacing

VASCULAR ACCESS

رگ گیری

Recommendations for Vascular Access in Cardiac Arrest Management		
COR	LOE	Recommendations
2a	B-NR	1. It is reasonable for providers to first attempt establishing intravenous access for drug administration in cardiac arrest.
2b	B-NR	2. Intraosseous access may be considered if attempts at intravenous access are unsuccessful or not feasible.
2b	C-LD	3. In appropriately trained providers, central venous access may be considered if attempts to establish intravenous and intraosseous access are unsuccessful or not feasible.
2b	C-LD	4. Endotracheal drug administration may be considered when other access routes are not available.

• روشهای جایگزین غیر از روش وریدی :

- 1. Intraosseous
- 2. Central venous
- 3. Endotracheal

Vasopressor Medications During Cardiac Arrest

Recommendations for Vasopressor Management in Cardiac Arrest		
COR	LOE	Recommendations
1	B-R	1. We recommend that epinephrine be administered for patients in cardiac arrest.
2a	B-R	2. Based on the protocols used in clinical trials, it is reasonable to administer epinephrine 1 mg every 3 to 5 min for cardiac arrest.
2a	C-LD	3. With respect to timing, for cardiac arrest with a nonshockable rhythm, it is reasonable to administer epinephrine as soon as feasible.
2b	C-LD	4. With respect to timing, for cardiac arrest with a shockable rhythm, it may be reasonable to administer epinephrine after initial defibrillation attempts have failed.
2b	C-LD	5. Vasopressin alone or vasopressin in combination with epinephrine may be considered in cardiac arrest but offers no advantage as a substitute for epinephrine in cardiac arrest.
3: No Benefit	B-R	6. High-dose epinephrine is not recommended for routine use in cardiac arrest.

داروهای وازوپرسور

- 1. اپی نفرین 1 میلی گرم هر 3 تا 5 دقیقه
- 2. در موارد قابل شوک ابتدا شوک داده بعد اپی نفرین تجویز میشود
- 3. در موارد غیر قابل شوک اپینفرین در اولین فرصت تجویز شود
- 4. در ریتمهای قابل شوک بعد از سه بار شوک همراه با ماساژ اپی نفرین داده شود.
- 5. از تجویز دوز بالای اپی نفرین خودداری شود

EPINEPHRINE

- هر چه سریعتر اپی نفرین تزریق شود موثر تر است.
- مزایای اپی نفرین در احیاء بیشتر مربوط به اثرات آلفا است.
- باعث افزایش فشار پرفوزیون سربرال و کورونر میشود
- اثرات بتا میتواند منفی باشد
- Epinephrine significantly increase ROSC and hospital survival to discharge
- وازوپرسین تاثیر بیشتری نسبت به اپی نفرین ندارد

داروهای غیر وازوپرسور

Nonvasopressor Medications During Cardiac Arrest

Recommendations for Nonvasopressor Medications		
COR	LOE	Recommendations
2b	B-R	1. Amiodarone or lidocaine may be considered for VF/pVT that is unresponsive to defibrillation.
2b	C-LD	2. For patients with OHCA, use of steroids during CPR is of uncertain benefit.
3: No Benefit	B-NR	3. Routine administration of calcium for treatment of cardiac arrest is not recommended.
3: No Benefit	B-R	4. Routine use of sodium bicarbonate is not recommended for patients in cardiac arrest.
3: No Benefit	B-R	5. The routine use of magnesium for cardiac arrest is not recommended.

- در موارد VF/VT مقاوم به شوک میتوان از آمیودارون یا لیدوکائین استفاده کرد
- استفاده از استروئید توصیه نمیشود
- از تجویز روتین کلسیم و منیزیم و بیکربنات خودداری شود
- پروکائین آمید و سوتالول و برتیلیم

ADJUNCT TO CPR

Recommendations for Adjuncts to CPR		
COR	LOE	Recommendations
2b	C-LD	1. If an experienced sonographer is present and use of ultrasound does not interfere with the standard cardiac arrest treatment protocol, then ultrasound may be considered as an adjunct to standard patient evaluation, although its usefulness has not been well established.
2b	C-LD	2. When supplemental oxygen is available, it may be reasonable to use the maximal feasible inspired oxygen concentration during CPR.
2b	C-LD	3. An abrupt increase in end-tidal CO ₂ may be used to detect ROSC during compressions or when a rhythm check reveals an organized rhythm.
2b	C-EO	4. Routine measurement of arterial blood gases during CPR has uncertain value.
2b	C-EO	5. Arterial pressure monitoring by arterial line may be used to detect ROSC during chest compressions or when a rhythm check reveals an organized rhythm.

- اکوکاردیوگرافی
- تجویز حداکثر اکسیژن
- CO₂ بازدمی
- اندازه گیری روتین ABG در احیاء
- آرتریال لاین
- پالس اکسیمتری

CORNERSTONE OF CPR

- 1. High quality CPR
- 2. Defibrillation when appropriate
- 3. Vasopressors and/or antiarrhythmics
- 4. Airway management

ختم احیاء

- چه موقع میتوان ختم احیاء را اعلام نمود؟
- ختم احیاء در موارد خارج بیمارستانی و داخل بیمارستانی متفاوت است
- BLS TOR RULE
- ACLS TOR RULE

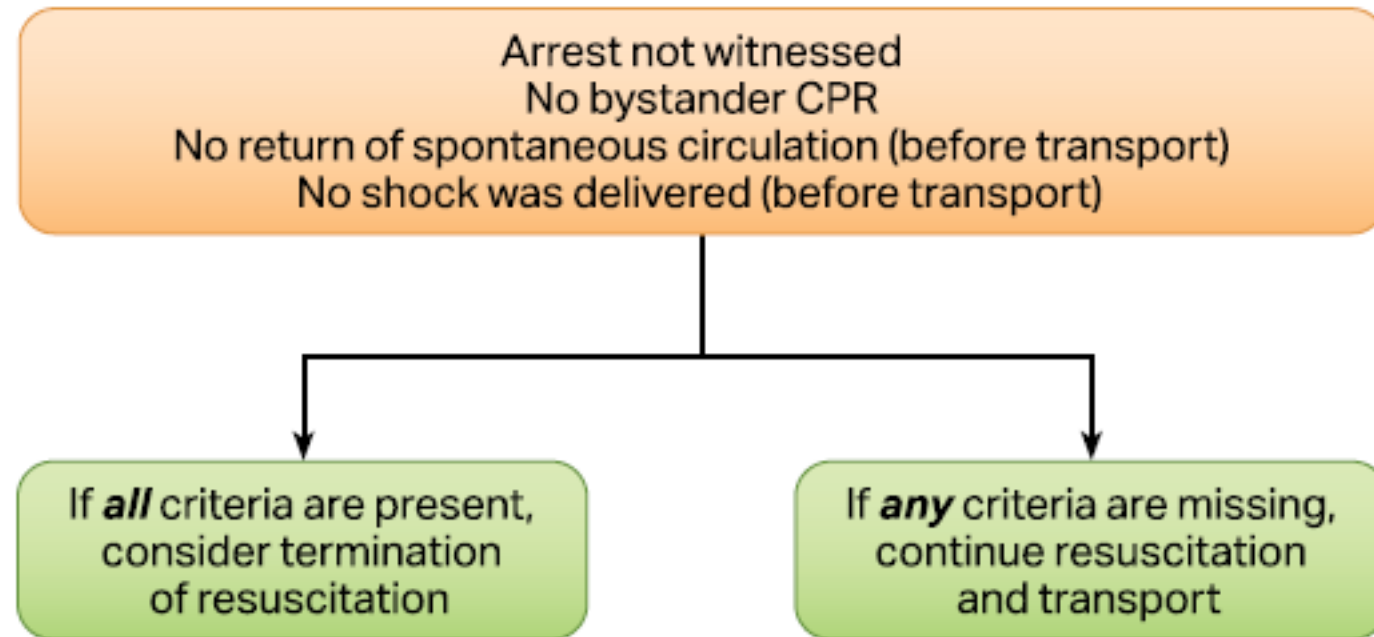
BLS Termination of Resuscitation

Arrest not witnessed by emergency medical services personnel
No return of spontaneous circulation (before transport)
No AED shock was delivered (before transport)

If **all** criteria are present,
consider termination
of resuscitation

If **any** criteria are missing,
continue resuscitation
and transport

ACLS Termination of Resuscitation



نکاتی قابل تامل در مورد ختم CPR

- احیاء تا 20 دقیقه
- EtCO₂ کمتر از 10
- احیاء بیشتر از 30 دقیقه
- اکوکاردیوگرافی

ADVANCED TECHNIQUES AND DEVICES

Recommendations for Advanced Airway Placement Considerations		
COR	LOE	Recommendations
1	B-NR	1. Frequent experience or frequent retraining is recommended for providers who perform endotracheal intubation.
1	C-LD	2. If advanced airway placement will interrupt chest compressions, providers may consider deferring insertion of the airway until the patient fails to respond to initial CPR and defibrillation attempts or obtains ROSC.
1	C-LD	3. Continuous waveform capnography is recommended in addition to clinical assessment as the most reliable method of confirming and monitoring correct placement of an endotracheal tube.
1	C-EO	4. EMS systems that perform prehospital intubation should provide a program of ongoing quality improvement to minimize complications and track overall supraglottic airway and endotracheal tube placement success rates.

Supraglottic or Endotracheal tube

- راه هوایی:
- در صورتیکه فرد متبحر و دوره دیده نبود ترجیحا با ماسک یا SGA ونتیله شود
- انتوباسیون نباید باعث توقف ماساژ بشود

وسایل و تکنیکهای جایگزین

1. Mechanical CPR
2. Impedance threshold devices
3. Active compression/decompression CPR
4. Interposed abdominal compression
5. Extracorporeal CPR

هیچکدام از این روشها مزیتی ایجاد نمیکند.

در صورتیکه تعداد پرسنل کم باشد میتوان احیاء مکانیکی را در نظر داشت.

احیاء مکانیکی

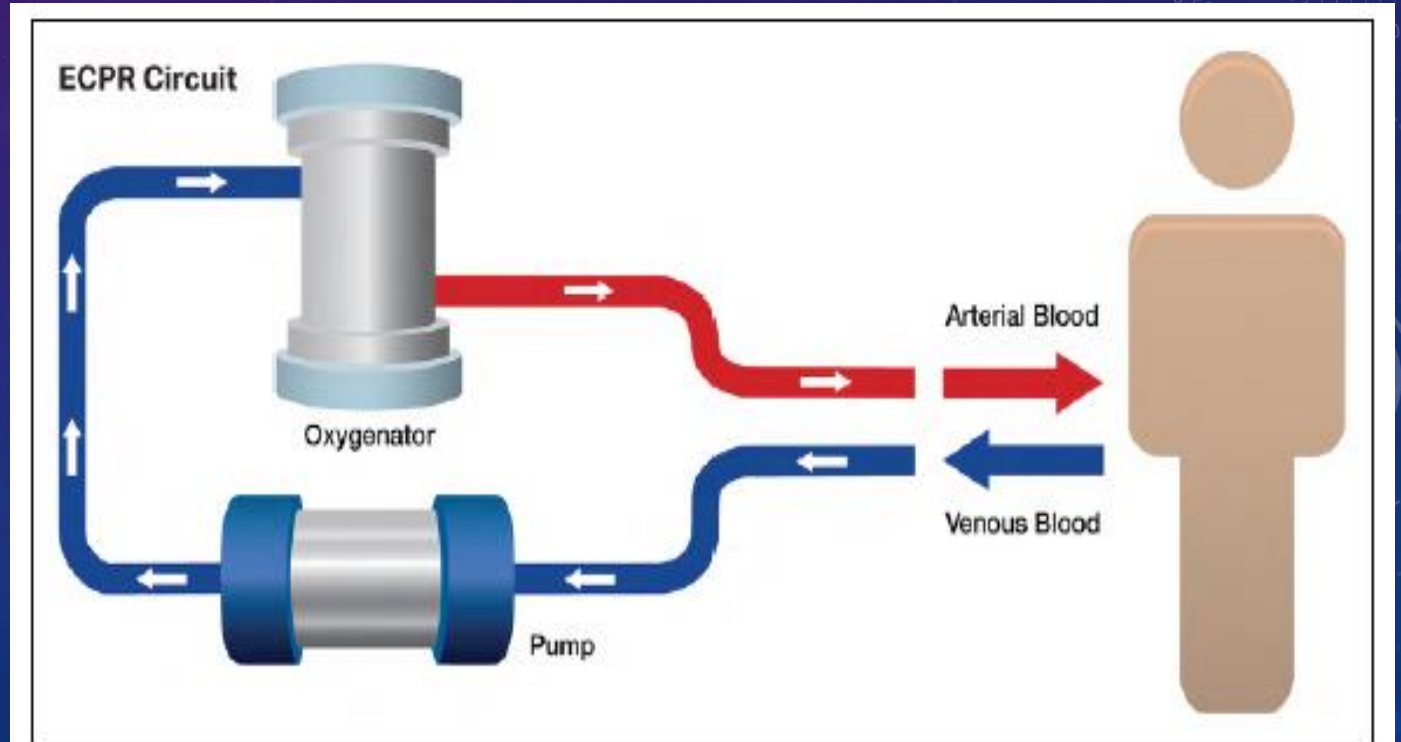
• در چه مواردی احیاء مکانیکی مفید است؟

- 1. تعداد کم پرسنل
- 2. در آمبولانس در حرکت
- 3. در آنژیوگرافی
- 4. در احیاء طولانی
- 5. در بعضی موارد عفونی

Recommendations for Mechanical CPR Devices		
COR	LOE	Recommendations
2b	C-LD	1. The use of mechanical CPR devices may be considered in specific settings where the delivery of high-quality manual compressions may be challenging or dangerous for the provider, as long as rescuers strictly limit interruptions in CPR during deployment and removal of the device.
3: No Benefit	B-R	2. The routine use of mechanical CPR devices is not recommended.

Extracorporeal CPR

Recommendation for Extracorporeal CPR		
COR	LOE	Recommendation
2b	C-LD	1. There is insufficient evidence to recommend the routine use of extracorporeal CPR (ECPR) for patients with cardiac arrest. ECPR may be considered for select cardiac arrest patients for whom the suspected cause of the cardiac arrest is potentially reversible during a limited period of mechanical cardiorespiratory support.



SIGNIFICANT ARRHYTHMIA MANAGEMENT

- 1. تاکیکاردی همراه با کمپلکس QRS پهن : تعداد < 150 و زمان بیش از 0.12 ثانیه - آمیودارون
- 2. Torsade de pointes
- 3. تاکیکاردی با کمپلکس باریک
- 4. فیبریلاسیون دهلیزی و فلاتر
- 5. برادیکاردی

Table 3. IV Medications Commonly Used for Acute Rate Control in Atrial Fibrillation and Atrial Flutter¹⁸

Medication	Bolus Dose	Infusion Rate	Notes
Nondihydropyridine Calcium Channel Blockers			
Diltiazem	0.25 mg/kg IV bolus over 2 min	5–10 mg/h	Avoid in hypotension, heart failure, cardiomyopathy, and acute coronary syndromes
Verapamil	0.075–0.15 mg/kg IV bolus over 2 min; may give an additional dose after 30 min if no response	0.005 mg/kg per min	Avoid in hypotension, heart failure, cardiomyopathy, acute and coronary syndromes
β-Adrenergic Blockers			
Metoprolol	2.5–5 mg over 2 min, up to 3 doses		Avoid in decompensated heart failure
Esmolol	500 µg/kg IV over 1 min	50–300 µg/kg per min	Short duration of action; avoid in decompensated heart failure
Propranolol	1 mg IV over 1 min, up to 3 doses		Avoid in decompensated heart failure
Other Medications			
Amiodarone	300 mg IV over 1 h	10–50 mg/h over 24 h	Multiple dosing schemes exist for amiodarone
Digoxin	0.25 mg IV, repeated to maximum dose 1.5 mg over 24 h		Typically used as adjunctive therapy with another option from above; caution in patients with renal impairment

IV indicates intravenous.

CARE AFTER ROSC

مراقبت پس از احیاء

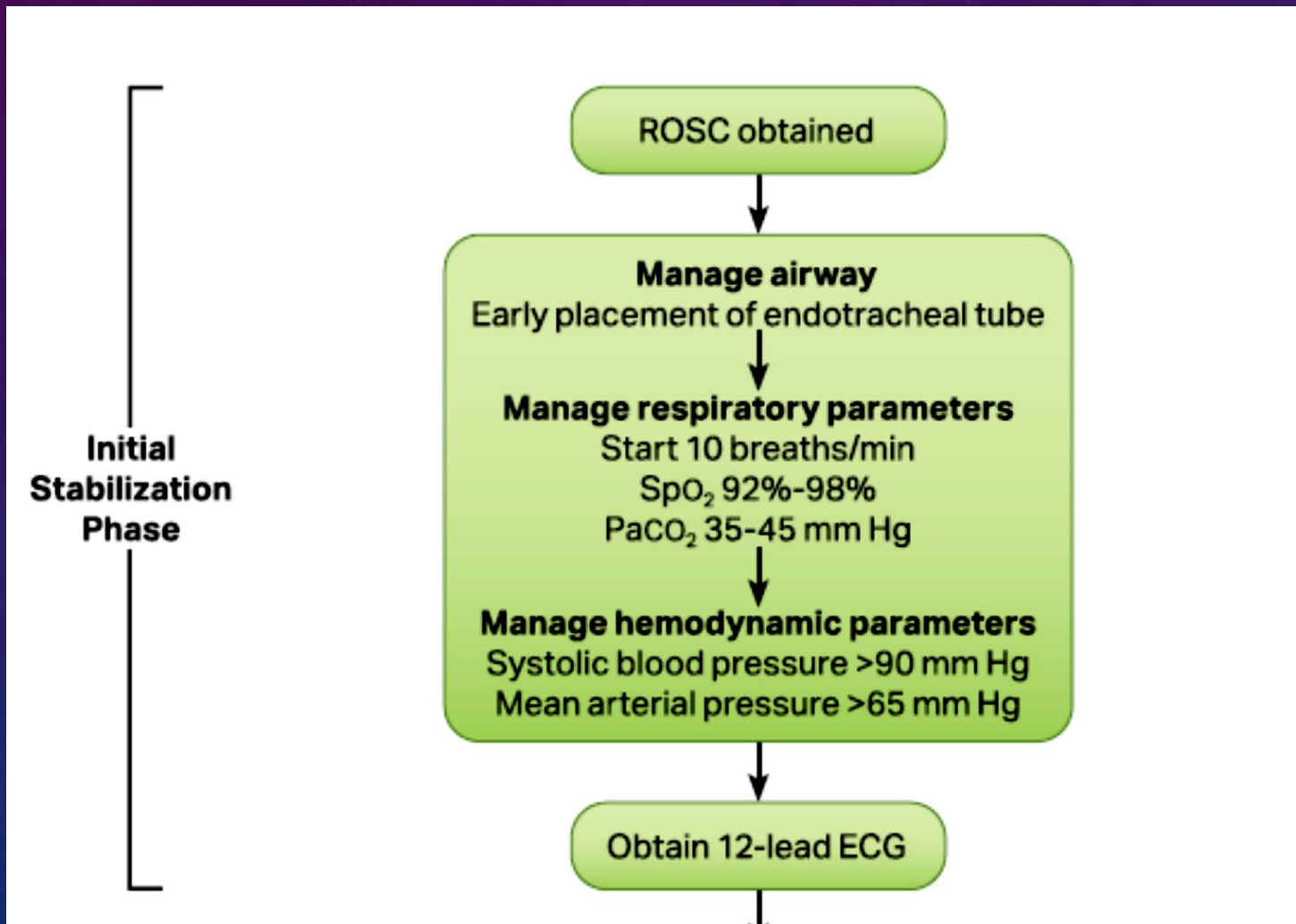
• پس از اقدامات اولیه احیاء و برگشت گردش خون بیمار موارد زیر دارای اهمیت است :

- 1. پایداری همودینامیک
- 2. تهویه مکانیکی
- 3. مدیریت دمای بدن
- 4. تشخیص و درمان زمینه ای
- 5. تشخیص و درمان تشنج
- 6. مراقبت و تشخیص عفونت بعدی
- 7. مراقبتهای ویژه

نکات مهم پس از احیاء :

- اکسیژن 100% تا امکان ارزیابی
- حفظ فشار سیستولیک : بیش از 90 و فشار میانگین بیش از 65
- در اولین فرصت ممکن **EKG** گرفته و از نظر ST elevation بررسی شود

الگوریتم مراقبت پس از احیاء



Initial Stabilization Phase

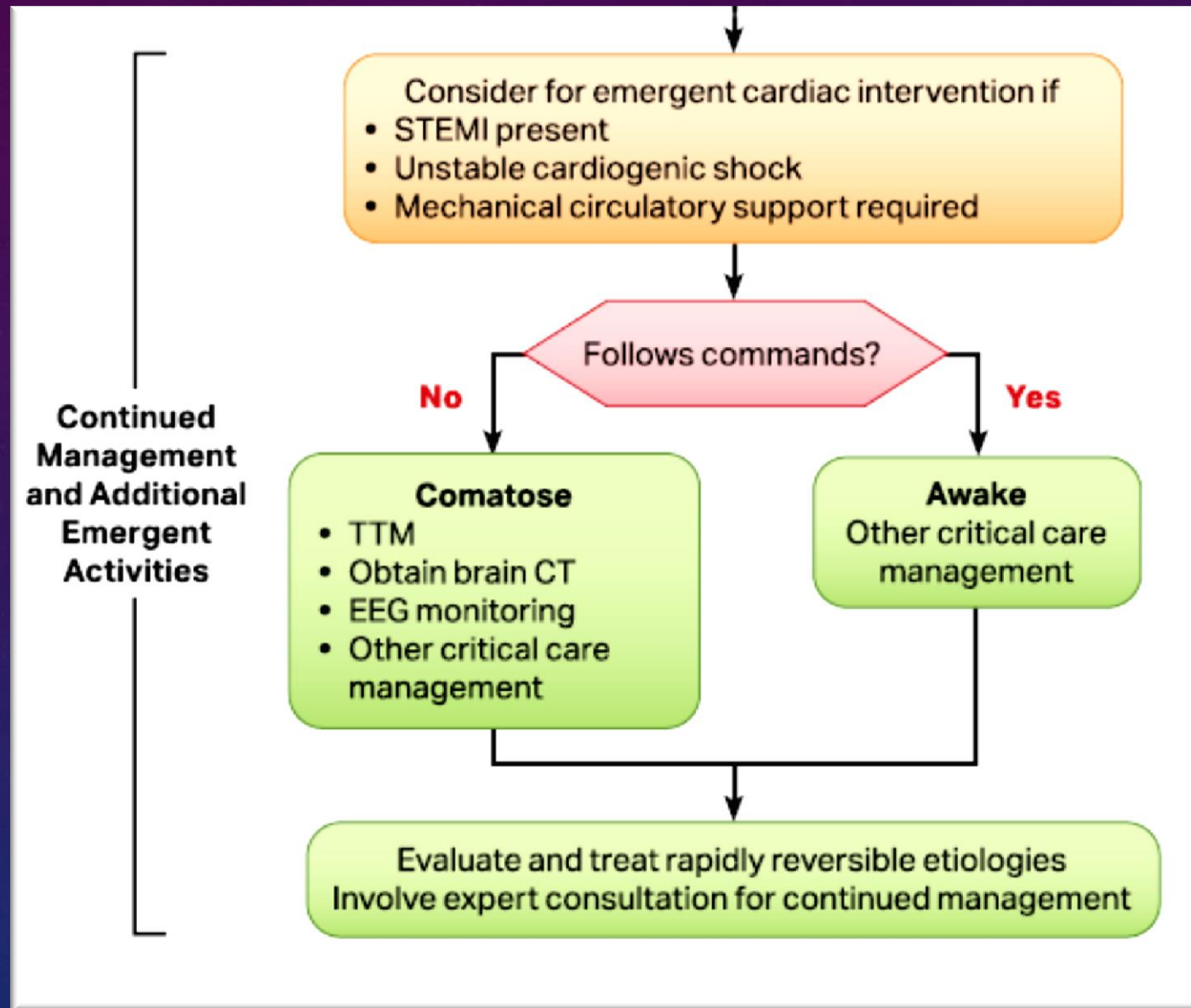
Resuscitation is ongoing during the post-ROSC phase, and many of these activities can occur concurrently. However, if prioritization is necessary, follow these steps:

- Airway management:
Waveform capnography or capnometry to confirm and monitor endotracheal tube placement
- Manage respiratory parameters:
Titrate FIO_2 for SpO_2 92%-98%; start at 10 breaths/min; titrate to PaCO_2 of 35-45 mm Hg
- Manage hemodynamic parameters:
Administer crystalloid and/or vasopressor or inotrope for goal systolic blood pressure >90 mm Hg or mean arterial pressure >65 mm Hg

مرحله اولیه یا پایدار سازی

ROSC

1. کاپنوگرافی
2. اشباع اکسیژن بین 92 تا 98 درصد
3. PaCO_2 بین 35 تا 45 میلیمتر جیوه
4. $\text{sBP} > 90$ و $\text{MAP} > 65$



Continued Management and Additional Emergent Activities

These evaluations should be done concurrently so that decisions on targeted temperature management (TTM) receive high priority as cardiac interventions.

- Emergent cardiac intervention:
Early evaluation of 12-lead electrocardiogram (ECG); consider hemodynamics for decision on cardiac intervention
- TTM: If patient is not following commands, start TTM as soon as possible; begin at 32-36°C for 24 hours by using a cooling device with feedback loop
- Other critical care management
 - Continuously monitor core temperature (esophageal, rectal, bladder)
 - Maintain normoxia, normocapnia, euglycemia
 - Provide continuous or intermittent electroencephalogram (EEG) monitoring
 - Provide lung-protective ventilation

H's and T's

Hypovolemia

Hypoxia

Hydrogen ion (acidosis)

Hypokalemia/hyperkalemia

Hypothermia

Tension pneumothorax

Tamponade, cardiac

Toxins

Thrombosis, pulmonary

Thrombosis, coronary

TARGETED TEMPERATURE MANAGEMENT

Recommendations for Indications for TTM		
COR	LOE	Recommendations
1	B-R	1. We recommend TTM for adults who do not follow commands after ROSC from OHCA with any initial rhythm.
1	B-R	2. We recommend TTM for adults who do not follow commands after ROSC from IHCA with initial nonshockable rhythm.
1	B-NR	3. We recommend TTM for adults who do not follow commands after ROSC from IHCA with initial shockable rhythm.

• در تمامی بیمارانی که obey ندارند

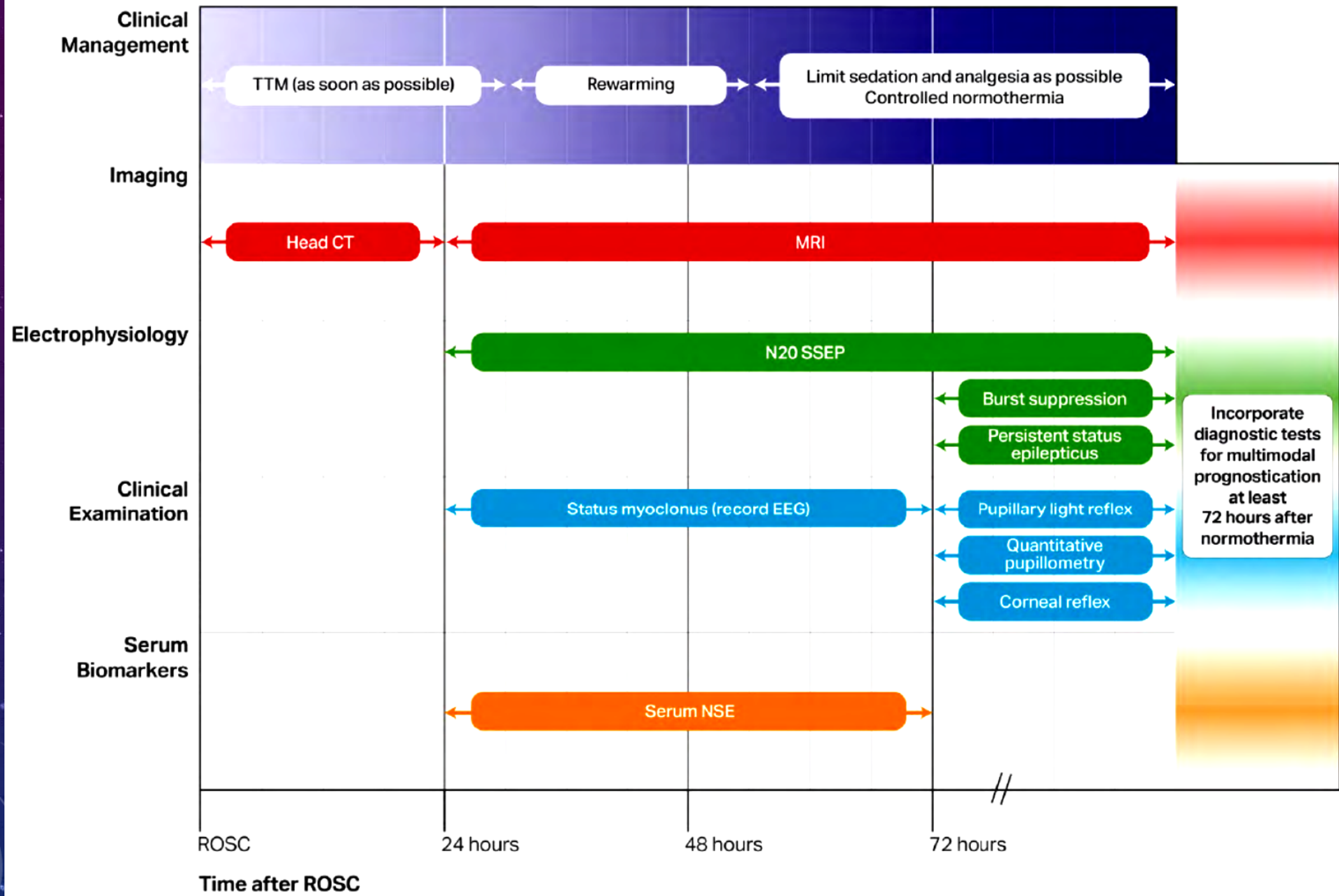
حفظ دما بین 32 تا 36 به مدت 24

ساعت انجام شود.

• از بروز تب جلوگیری شود

PCI AFTER CARDIAC ARREST

Recommendations for PCI After Cardiac Arrest		
COR	LOE	Recommendations
1	B-NR	1. Coronary angiography should be performed emergently for all cardiac arrest patients with suspected cardiac cause of arrest and ST-segment elevation on ECG.
2a	B-NR	2. Emergent coronary angiography is reasonable for select (eg, electrically or hemodynamically unstable) adult patients who are comatose after OHCA of suspected cardiac origin but without ST-segment elevation on ECG.
2a	C-LD	3. Independent of a patient's mental status, coronary angiography is reasonable in all post-cardiac arrest patients for whom coronary angiography is otherwise indicated.



RECOVERY

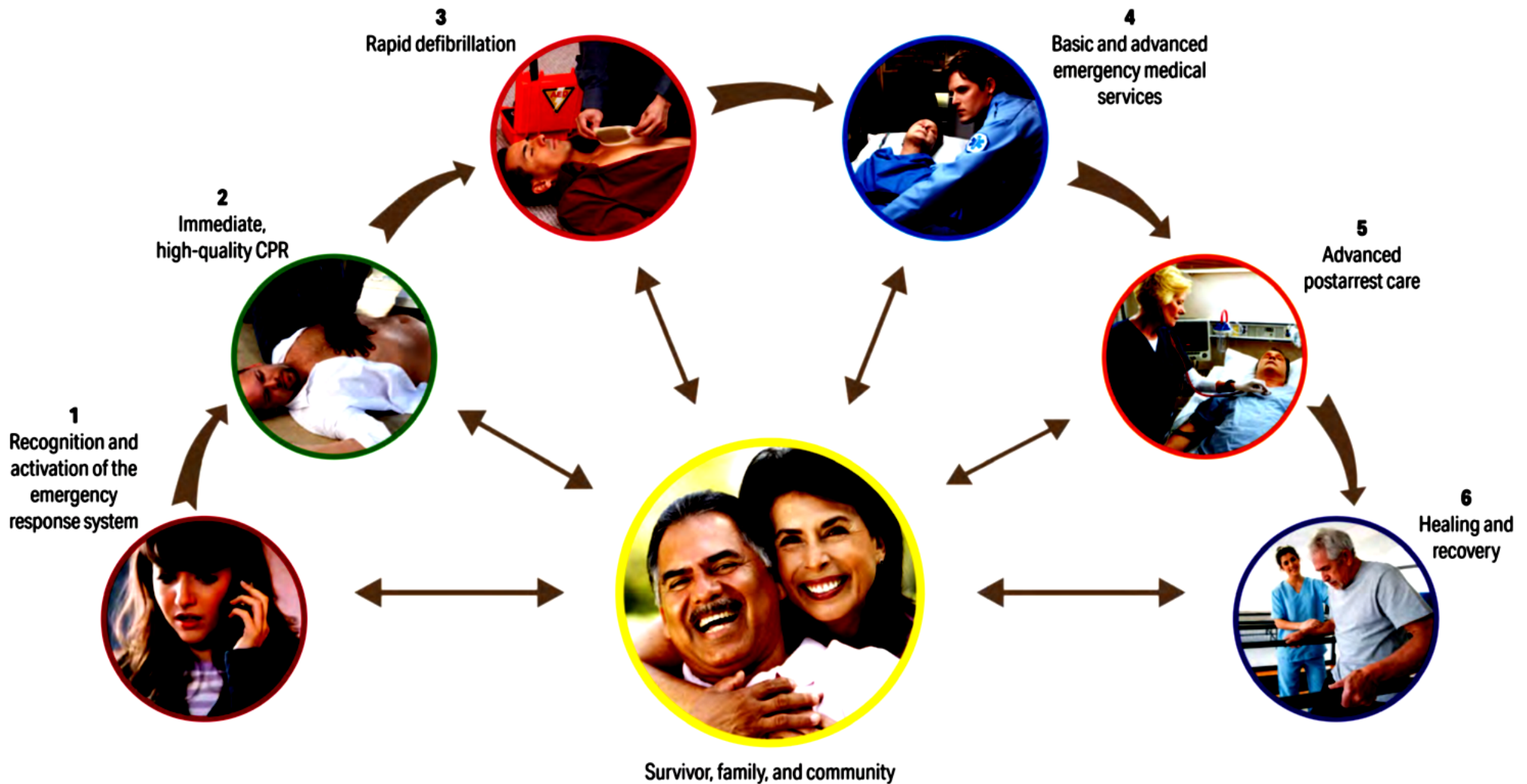
Anxiety

PTSD

Depression

Fatigue

Rehabilitation



از توجه تان سپاسگزارم