

SAUDI HEART ASSOCIATION

NATIONAL CPR COMMITTEE

THE EVIDENCED BASED 2015 CPR GUIDELINES

Chapter 2 Adult Basic Life Support and Automated External Defibrillation.

This review comprises the most extensive literature search and evidence evaluation to date on the most important international BLS interventions, diagnostics, and prognostic factors for cardiac arrest victims. It reemphasizes that the critical lifesaving steps of BLS are:

- A. Prevention
- B. Immediate recognition and activation of the emergency response system
- C. Early high-quality CPR, and (d) rapid defibrillation for shockable rhythms.

This is of the 2015 treatment recommendations for adult basic life support (BLS) and automated external defibrillation (AED). BLS task force has been developed to review of the 2010 CoSTR, resulted in the generation of 36 PICO (population, intervention, comparator, outcome) format questions for systematic reviews.

The body of knowledge encompassed in this CoSTR comprises 23 individual systematic reviews with 32 treatment recommendations, derived from a GRADE evaluation of 27 randomized clinical trials and 181 observational studies of variable design and quality conducted over a 35-year period. The treatment recommendations in this Part are limited to recommendations for adults.

The sequence of actions that linking the victim of sudden cardiac arrest with survival are called the Chain of Survival.



AND WHOEVER KEEP ASOUL ALIVE, IT IS AS THOUGH HE KEPT ALIVE ALL MEN

قال تعالى: ﴿وَمَنْ أَحْيَاهَا فَكَأَنَّمَا أَحْيَا النَّاسَ جَمِيعًا﴾ سورة المائدة آية ٣٢.

Whereas the 2010 ILCOR Consensus on Science provided important direction for the “what” in resuscitation (ie, what to do), the 2015 consensus has begun with the GRADE methodology to provide direction for the quality of resuscitation. We hope that resuscitation councils and other stakeholders will be able to translate this body of knowledge of international consensus statements to build their own effective resuscitation guidelines.

1. Early Access and Cardiac Arrest Prevention

Early Access: Emergency Medical Dispatch

The first contact with emergency medical services (EMS) is usually via an emergency call. The correct and timely identification of cardiac arrest is critical to ensuring:

- (1) the appropriate dispatch of a high-priority response,
- (2) the provision of telephone CPR instructions, and
- (3) the activation of community first responders carrying AEDs.

Optimizing EMS dispatch is likely to be one of the most cost-effective solutions to improving outcomes from cardiac arrest. Thus, optimizing the ability of dispatchers to identify cardiac arrest and deliver telephone CPR instructions is critical to improving outcomes.

Dispatcher Recognition of Cardiac Arrest

ILCOR Treatment Recommendation:

We recommend that dispatchers determine if a patient is unconscious with abnormal breathing. If the victim is unconscious with abnormal or absent breathing, it is reasonable to assume that the patient is in cardiac arrest at the time of the call (strong recommendation, very-low-quality evidence).

We recommend that dispatchers be educated to identify unconsciousness with abnormal breathing. This education should include recognition and significance of agonal breaths across a range of clinical presentations and descriptions (strong recommendation, very-low-quality evidence).

Dispatcher Instructions

ILCOR Treatment Recommendation

We recommend that dispatchers provide chest compression—only CPR instructions to callers for adults with suspected OHCA (strong recommendation, low-quality evidence).

SHA Recommendation: (we highly recommend a specific tailored education program for dispatchers in EMS systems including those in the red crescent authorities, the civil defense, and police dispatchers. That might improve the effective communication with the callers and provide CPR and other instructions regarding the critical situation or suspected OHCA.)

Resuscitation Care for Suspected Opioid-Associated Emergencies

ILCOR Treatment Recommendation:

No treatment recommendation can be made for adding naloxone to existing BLS practices for the BLS management of adults and children with suspected opioid-associated cardiac or respiratory arrest in the prehospital setting.

Opioid Overdose Response Education

ILCOR Treatment Recommendation:

We suggest offering opioid overdose response education, with or without naloxone distribution, to persons at risk for opioid overdose in any setting (weak recommendation, very- low-quality evidence).

SHA Recommendation : (We recommend to include opioid educational program in the first aid courses and during the related national awareness programs)

Drowning Search and Rescue

ILCOR Treatment Recommendations:

We recommend that submersion duration be used as a prognostic indicator when making decisions surrounding search and rescue resource management/operations (strong recommendation, moderate quality evidence for prognostic significance).

We suggest against the use of age, EMS response time, water type (fresh or salt), water temperature, and witness status when making prognostic decisions (weak recommendation, very-low-quality evidence for prognostic significance).

We acknowledge that this review excluded exceptional and rare case reports that identify good outcomes after pro-longed submersion in icy cold water.

SHA Recommendation: (we will follow ILCOR treatment recommendation).

2. Early High-Quality CPR

Early high-quality CPR saves lives. This section reviews the evidence surrounding how to start CPR, as well as optimal chest compression characteristics(which are defined by compressions of the correct position, depth, and rate, ensuring full release and minimizing interruptions), compression-only CPR, pulse checks, and ventilation. These collectively if done properly, they will ensure delivering high quality CPR. Treatment recommendations in this Part are limited to adult patients.

Starting CPR:

Delivering high-quality chest compressions as early as possible is vital to high-quality CPR and optimizes the chance of ROSC and survival after cardiac arrest. for adult victims of cardiac arrest, CPR should begin with giving chest compressions rather than opening the airway and delivering rescue breaths.

Treatment Recommendation

We suggest commencing CPR with compressions rather than ventilations (weak recommendation, very-low-quality evidence).

SHA Recommendation : (we recommend starting CPR with the sequence of CAB in the pre-hospital situations, while the sequence of ABC is still effective inside the health care facilities).

Chest Compression–Only CPR Versus Conventional CPR:

Bystander CPR is a key life-saving factor in the Chain of Survival. CPR before EMS arrival can (1) prevent VF/PVT from deteriorating to asystole, (2) increase the chance of defibrillation, (3) contribute to preservation of heart and brain function, and (4) improve survival.

ILCOR *Treatment Recommendations:*

We recommend that chest compressions should be performed for all patients in cardiac arrest (strong recommendation, very-low-quality evidence).

We suggest that those who are trained and willing to give rescue breaths do so for all adult patients in cardiac arrest (weak recommendation, very-low-quality evidence).

SHA Recommendation: (ventilation is a skillful action which need a quite professional training, whereas chest compressions is easy to learn. So chest compressions should be delivered for all patients in cardiac arrest and ventilation provided with trained rescuers. Training on ventilation skills should include bystandards and lay persons in addition to health care provider).

CPR Before Defibrillation:

Evidence Summary

In summary, the evidence suggests that among unmonitored patients with cardiac arrest outside of the hospital and an initial rhythm of VF/PVT, there is no benefit to a period of CPR of 90 to 180 seconds before defibrillation when compared with immediate defibrillation with CPR being performed while the defibrillator equipment is being applied.

ILCOR *Treatment Recommendation:*

During an unmonitored cardiac arrest, we suggest a short period of CPR until the defibrillator is ready for analysis and, if indicated, defibrillation.

SHA Recommendation: (defibrillator should attached and operated as soon as it is available).

Hand Position During Compressions:

Hand position is just one of several components of chest compressions that can alter effectiveness.

ILCOR *Treatment Recommendation:*

We suggest performing chest compressions on the lower half of the sternum on adults in cardiac arrest (weak recommendation, very-low-quality evidence).

SHA Recommendation: (there is no change in this recommendation from the previous guidelines. We are practicing hand position on the lower half of the sternum, place the heels of the hand 2-3 fingers above the xyphisternal angel and also placing the hands below an imaginary line between the two nipples. Skill training should include practice on hand position using skill guide high fidelity manikins).

Chest Compression Rate:

Chest compression rate can be defined as the actual rate used during each continuous period of chest compressions over 1 minute, excluding any pauses. It differs from the number of chest compressions actually delivered in 1 minute, which takes into account any interruptions in chest compressions.

ILCOR *Treatment Recommendation:*

We recommend a manual chest compression rate of 100 to 120/min (strong recommendation, very-low-quality evidence).

SHA Recommendation: (we recommend practice a compression rate between 100-120 / minute. Training should include practice on the compression rate on high fidelity manikins.)

Chest Compression Depth:

ILCOR *Treatment Recommendations:*

We recommend a chest compression depth of approximately 5 cm (2 inches) (strong recommendation, low-quality evidence) while avoiding excessive chest compression depths (greater than 6 cm [greater than 2.4 inches] in an average adult) (weak recommendation, low quality evidence) during manual CPR.

SHA Recommendation: (Saudi Arabia having multi-nation groups, so we recommend a practice of chest compression depth between 4.5 to 5.5 cm depending on the size of the victim body).

Chest Wall Recoil:

ILCOR *Treatment Recommendation*

We suggest that rescuers performing manual CPR avoid leaning on the chest between compressions to allow full chest wall recoil (weak recommendation, very-low-quality evidence).

SHA Recommendation: (we recommend no change in the current practice as it is going with the same recommendation).

Minimizing Pauses in Chest Compressions:

ILCOR *Treatment Recommendations:*

We suggest that in adult patients receiving CPR with no advanced airway, the interruption of chest compressions for delivery of 2 breaths should be less than 10 seconds (weak recommendation, low-quality evidence).

We recommend that total pre-shock and post-shock pauses in chest compressions be as short as possible. For manual defibrillation, we suggest that pre-shock pauses be as short as possible and no more than 10 seconds (strong recommendation, low-quality evidence).

We suggest during conventional CPR that chest compression fraction (ie, total CPR time devoted to compressions) should be as high as possible and at least 60% (weak recommendation, low-quality evidence).

SHA Recommendation: (we recommend no change in the current practice as it is going with the same recommendation)

Compression-Ventilation Ratio:

ILCOR Treatment Recommendation:

We suggest a compression-ventilation ratio of 30:2 compared with any other compression-ventilation ratio in patients in cardiac arrest (weak recommendation, low-quality evidence).

SHA Recommendation: (we recommend no change in the current practice as it is going with the same recommendation)

Timing of CPR Cycles:

ILCOR Treatment Recommendation:

We suggest pausing chest compressions every 2 minutes to assess the cardiac rhythm (weak recommendation, low-quality evidence).

SHA Recommendation: (we recommend no change in the current practice as it is going with the same recommendation)

Check for Circulation During BLS:

Treatment Recommendation

Outside of the ALS environment where invasive monitoring is available, there is insufficient data around the value of a pulse check while performing CPR. We therefore do not make a treatment recommendation regarding the value of a pulse check.

SHA Recommendation:(we suggest if the patient attached to non-invasive cardiac monitor, the waves produced by chest compression may indicate the effectiveness of the compression. We support the practice of no direct pulse check during CPR).

Feedback for CPR Quality:

ILCOR Treatment Recommendation

We suggest the use of real-time audiovisual feedback and prompt devices during CPR in clinical practice as part of a comprehensive system for care for cardiac arrest (weak recommendation, very-low-quality evidence).

We suggest against the use of real-time audiovisual feedback and prompt devices in isolation (i.e, not part of a comprehensive system of care) (weak recommendation, very-low-quality evidence).

SHA Recommendation: (we recommend no change in the current practice as it is going with the same recommendation)

EMS Chest Compression–Only Versus Conventional CPR:

The treatment of a patient with OHCA is extremely complex from several perspectives. Operationally, there is very significant heterogeneity in EMS systems design (eg, emergency medical responder versus emergency medical technician versus

paramedic versus physician based) and resource availability (eg, number of rescuers, equipment, evidence-based protocols, quality improvement programs). Clinically, there is extreme patient and arrest location variability, with patients located in urban, rural, and remote patient settings and in unpredictable and diverse environments with variable rates of bystander CPR and AED use. Logistically, the initial EMS care of an OHCA victim involves several concurrent goals with complex interactions of scene safety, patient assessment, patient care, communication, extrication, and transport.

ILCOR *Treatment Recommendation:*

We suggest that where EMS systems have adopted bundles of care involving minimally interrupted cardiac resuscitation, the bundle of care is a reasonable alternative to conventional CPR for witnessed shockable out of hospital cardiac arrest (weak recommendation, very-low-quality evidence).

SHA Recommendation: (we recommend no change in the current practice as it is going with the same recommendation. We emphasis on the rule of the effective and efficient EMS system).

Passive Ventilation Technique:

ILCOR *Treatment Recommendation:*

We suggest against the routine use of passive ventilation techniques during conventional CPR (weak recommendation, very-low-quality evidence).

We suggest that where EMS systems have adopted bundles of care involving continuous chest compressions, the use of passive ventilation techniques may be considered as part of that bundle for patients in OHCA (weak recommendation, very-low-quality evidence).

SHA Recommendation: (we recommend no change in the current practice as it is going with the same recommendation)

Harm from CPR to Victims Not in Cardiac Arrest:

Many lay rescuers are concerned that delivering chest compressions to a person who is not in cardiac arrest could lead to serious complications and, thus, are reluctant to initiate CPR even when a person is actually in cardiac arrest. Studies reporting harm from CPR to persons not in cardiac arrest were reviewed.

ILCOR *Treatment Recommendation:*

We recommend that laypersons initiate CPR for presumed cardiac arrest without concerns of harm to patients not in cardiac arrest (strong recommendation, very-low-quality evidence).

SHA Recommendation: (we recommend no change in the current practice as it is going with the same recommendation)

3. Early Defibrillation

This section reviews (1) the evidence surrounding the clinical benefit of AEDs in the out-of-hospital setting by laypeople and healthcare providers, and (2) the complex choreography of care needed to ensure high-quality CPR and effective defibrillation. Collectively, we continue to place strong emphasis on the importance of rapid defibrillation as the treatment of choice for VF/PVT in the out-of-hospital and hospitalized settings.

Public-Access Defibrillation:

ILCOR Treatment Recommendation:

We recommend the implementation of public-access defibrillation programs for patients with OHCA (strong recommendation, low-quality evidence).

SHA Recommendation: (we recommend the implementation of such recommendation with emphasis to be part of the safety license of constructed industrial and trading building).

Rhythm Check Timing:

ILCOR Treatment Recommendation:

We suggest immediate resumption of chest compressions after shock delivery for adults in cardiac arrest in any setting (weak recommendation, very-low-quality evidence).

If there is alternative physiologic evidence of ROSC (eg, arterial waveform or rapid rise in ETCO₂), chest compressions can be paused briefly for rhythm analysis.

SHA Recommendation: (we recommend no change in the current practice as it is going with the same recommendation)

Analysis of Rhythm During Chest Compression:

ILCOR Treatment Recommendations:

We suggest against the introduction of artifact-filtering algorithms for analysis of electrocardiographic rhythm during CPR unless as part of a research program.

We suggest that where EMS systems have already integrated artifact-filtering algorithms into clinical practice, it is reasonable to continue with their use.

SHA Recommendation: (we recommend no change in the current practice as it is going with the same recommendation)

2005 and 2010 Topics Not Reviewed in 2015

The following topics were included in 2010 but not in this publication (deferred standardized reviews):

- Etiology of cardiac arrest
- Incidence of cardiac arrest
- Recognition of cardiac arrest
- Facedown victim
- Finding the right hand placement
- Lay rescuer compression-only versus no CPR
- Rescuer fatigue in chest compression-only CPR
- Alternative compression techniques
- Interposed abdominal compressions (IAC) CPR
- Harm to rescuers from CPR
- Opening the airway
- Foreign-body airway obstruction
- Barrier devices
- Oropharyngeal adjuncts
- Tidal volumes and ventilation rates

The reader is referred to the [2010 CoSTR publication](#) for the reviews.

The following topics were included in 2005 but not in this publication:

- Devices for airway positioning
- Duty cycle
- CPR in prone position
- Leg-foot chest compressions
- Mouth-to-nose ventilation
- Mouth-to-tracheal stoma ventilation
- Recovery position
- Airway opening
- CPR for drowning victim in water
- Removing drowning victim from water
- Improving EMS response interval

(PRE-HOSPITAL) ADULT BASIC LIFE SUPPORT

UNRESPONSIVE?

Shout for help / Call 997 and AED

look for breathing effort
NOT BREATHING NORMALLY? Or gasping breath

30 CHEST COMPRESSIONS

Go for ABC assessment
Open airway, - Look, listen, feel (if HCP or trained layperson)
Only 30 chest compressions (if untrained rescuer)

2 rescue breaths (if HCP or trained layperson)
Continue the cycle of **30 compressions: 2 breaths** (rate 100-120/m)
Until EMS arrives or unable to proceed

(قبل الوصول للمستشفى) دعم سبل المحافظة على الحياة الأساسية
(للبالغين)

المصاب غير واعي؟

أطلب المساعدة / اتصل بالهلال الأحمر ٩٩٧ واطلب جهاز الصدمات الأوتوماتيكي

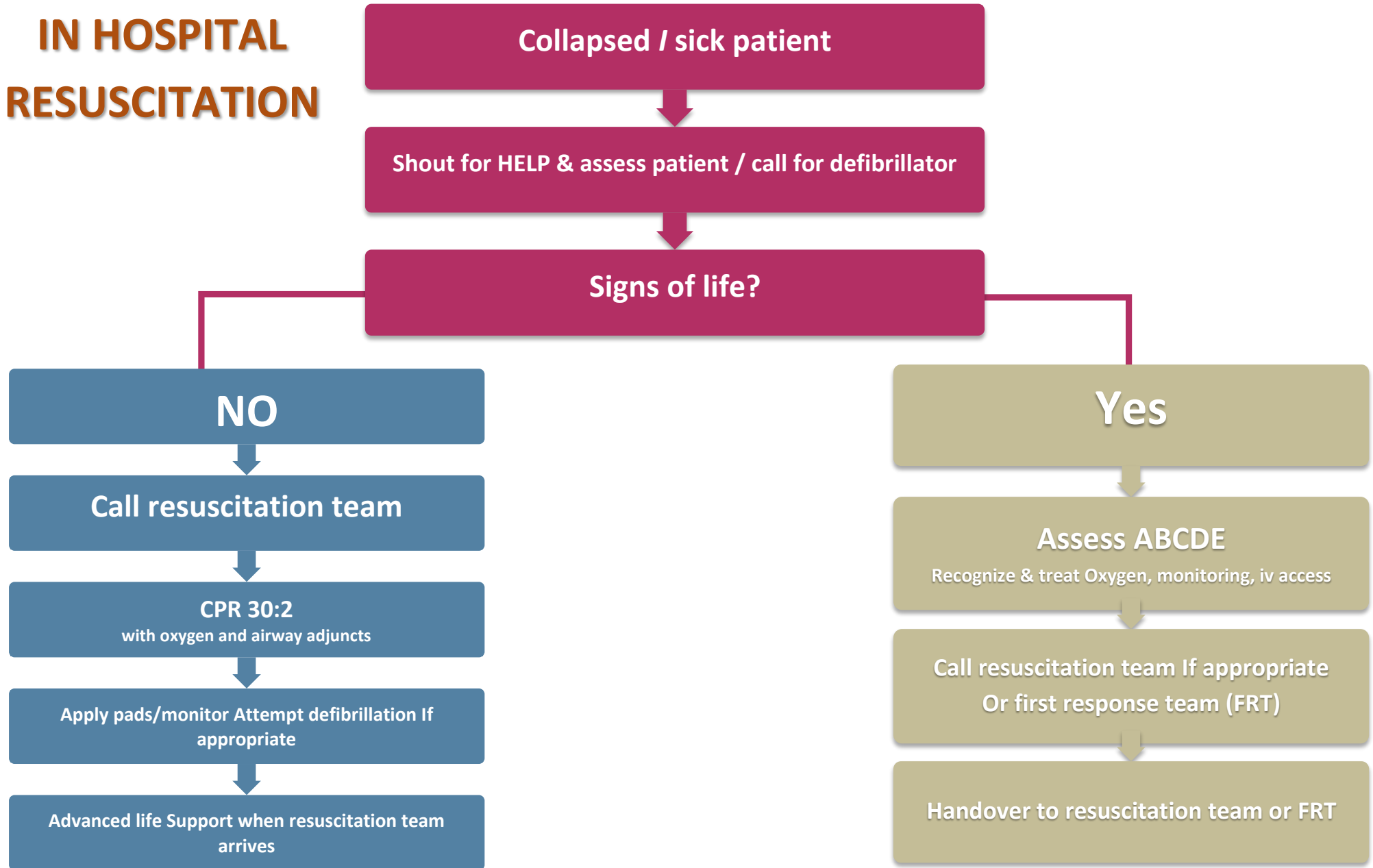
أنظر إلى تنفس المصاب
في حالة احتضار!!! أولاً يتنفس بصورة طبيعية؟؟

قم بعمل ٣٠ ضغطة صدرية

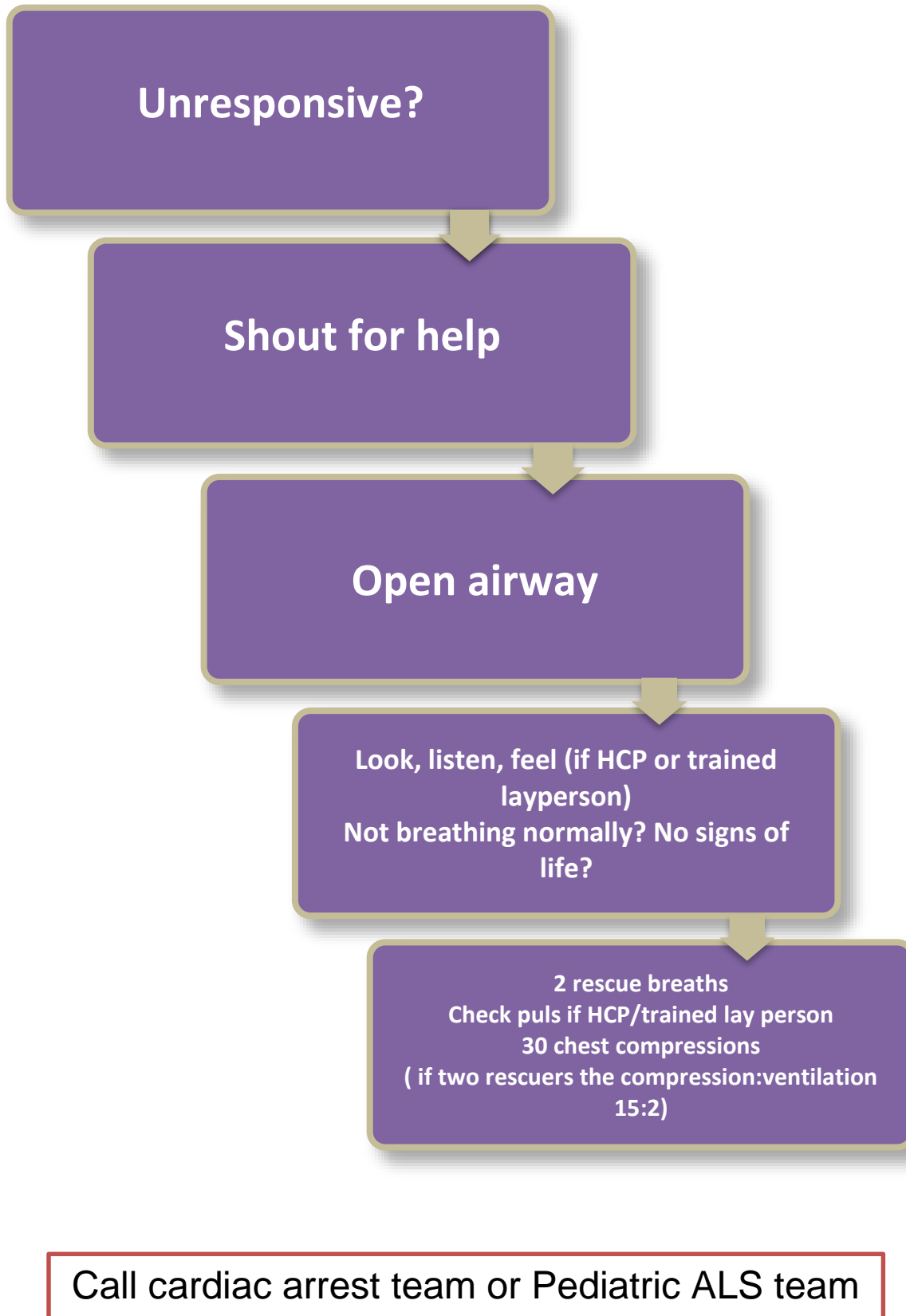
قم بفتح مجرى الهواء

قم بإعطاء نفسين (إذا كنت متديراً على ذلك)
أو باشر بعمل ٣٠ ضغطة صدرية: ٢ تنفس (بمعدل ١٠٠-١٢٠ ضغطة في الدقيقة)
كرهذه الخطوة (الأخيرة) كل دقيقتين لحين حضور المساعدة أو عدم القدرة على الإكمال

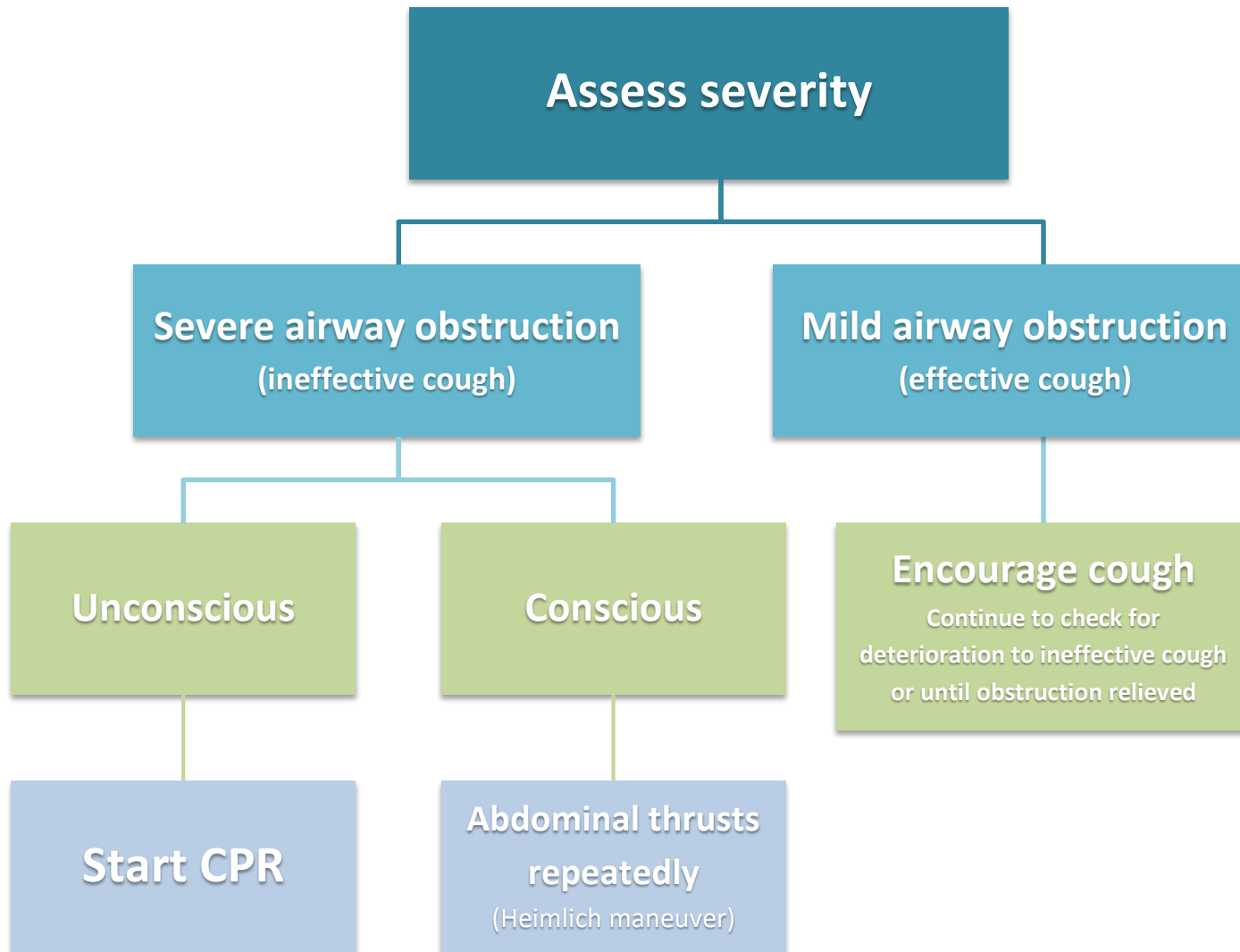
IN HOSPITAL RESUSCITATION



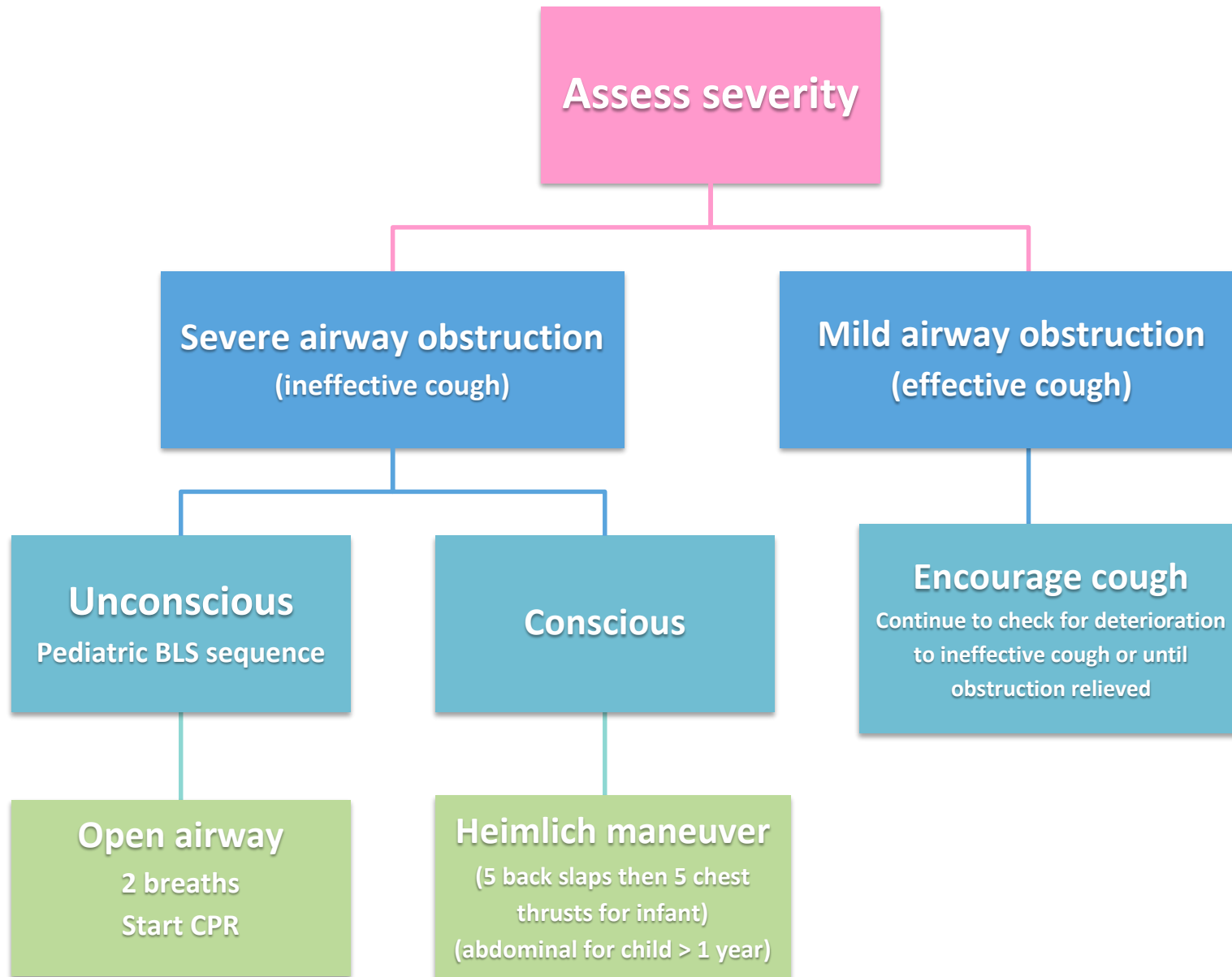
PEDIATRIC BASIC LIFE SUPPORT



ADULT & CHILD FOREIGN BODY AIRWAY OBSTRUCTION TREATMENT



INFANT FOREIGN BODY AIRWAY OBSTRUCTION TREATMENT



AUTOMATED EXTERNAL DEFIBRILLATION

