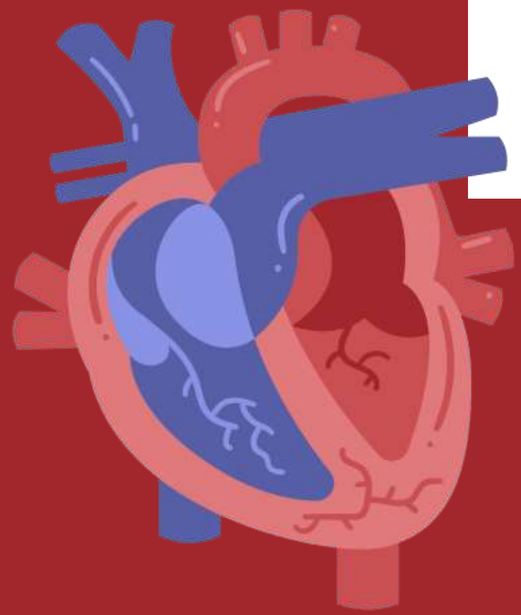
# UPDATE BASIC LIFE SUPPORT

dr. Angela Puspita, Sp.EM, FICEP



# WELCOME, PARTICIPANTS..!

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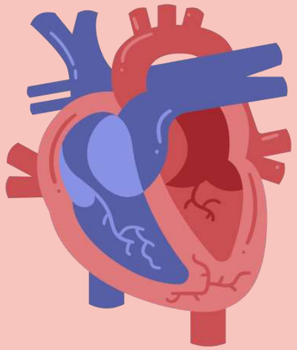


# TUJUAN PEMBELAJARAN

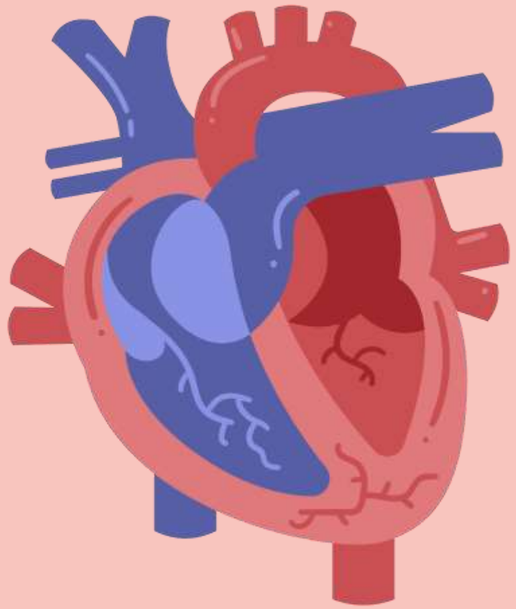
1. Memahami BLS secara tepat baik sendiri maupun dalam tim

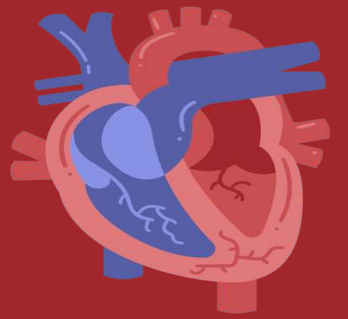
2. Memahami BLS dengan Automatic External Defibrilator (AED) pada pasien dewasa, anak, dan bayi

3. Memahami tatalaksana obstruksi benda asing pada pasien dewasa, anak, dan bayi.

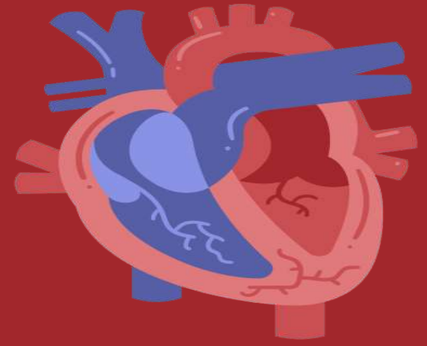
# MATERI POKOK/SUB MATERI POKOK:

1. Melakukan Bantuan Hidup Dasar (BHD)
2. Melakukan penilaian dan penatalaksanaan awal (initial assessment)
3. Melakukan penatalaksanaan pasien dengan gangguan jalan napas dan pernapasan (airway and breathing)
4. Melakukan penatalaksanaan pasien dengan gangguan sirkulasi
5. Melakukan pertolongan pada orang tersedak (chocking)





The AHA's BLS  is designed for healthcare professionals and other personnel who need to know how to perform CPR and other basic cardiovascular life support skills in a wide variety of in-facility and prehospital settings.



*Adult Out-of-Hospital Chain of Survival*


*Adult In-Hospital Chain of Survival*


*Pediatric Out-of-Hospital Chain of Survival*


*Pediatric In-Hospital Chain of Survival*


**0 Minutes**
BREATHING STOPS; THE HEART WILL SOON STOP BEATING

**4-6 Minutes**
POSSIBILITY OF LONG-TERM BRAIN DAMAGE

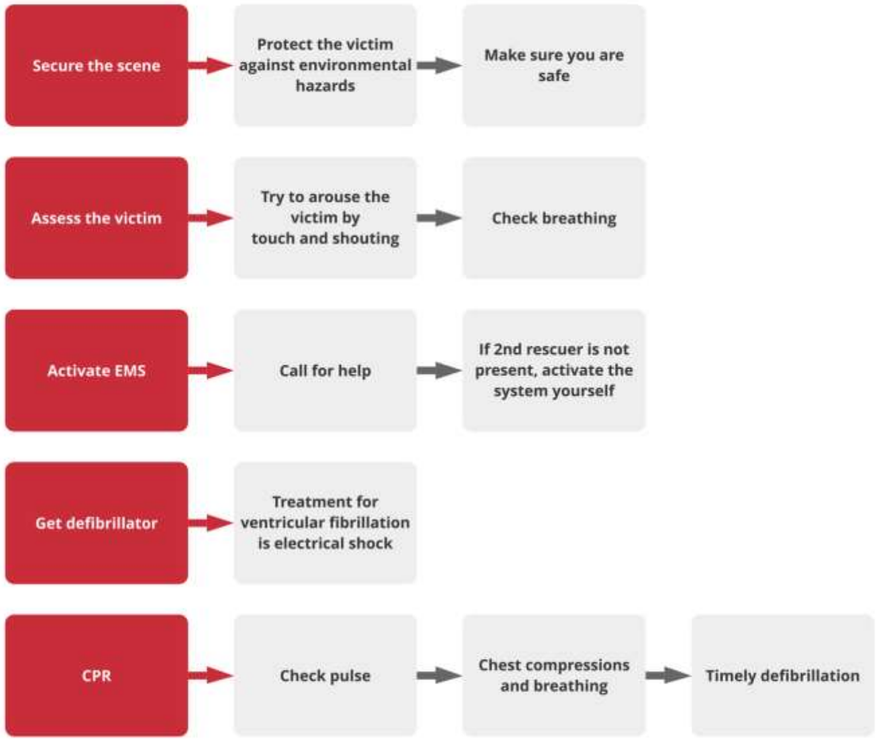
**6-10 Minutes**
HIGH PROBABILITY OF LONG-TERM BRAIN DAMAGE

**Over 10-15 Minutes**
CERTAIN IRREVERSIBLE BRAIN DAMAGE RESULTING IN DEATH

## The BLS Survey

The BLS Survey includes four steps:

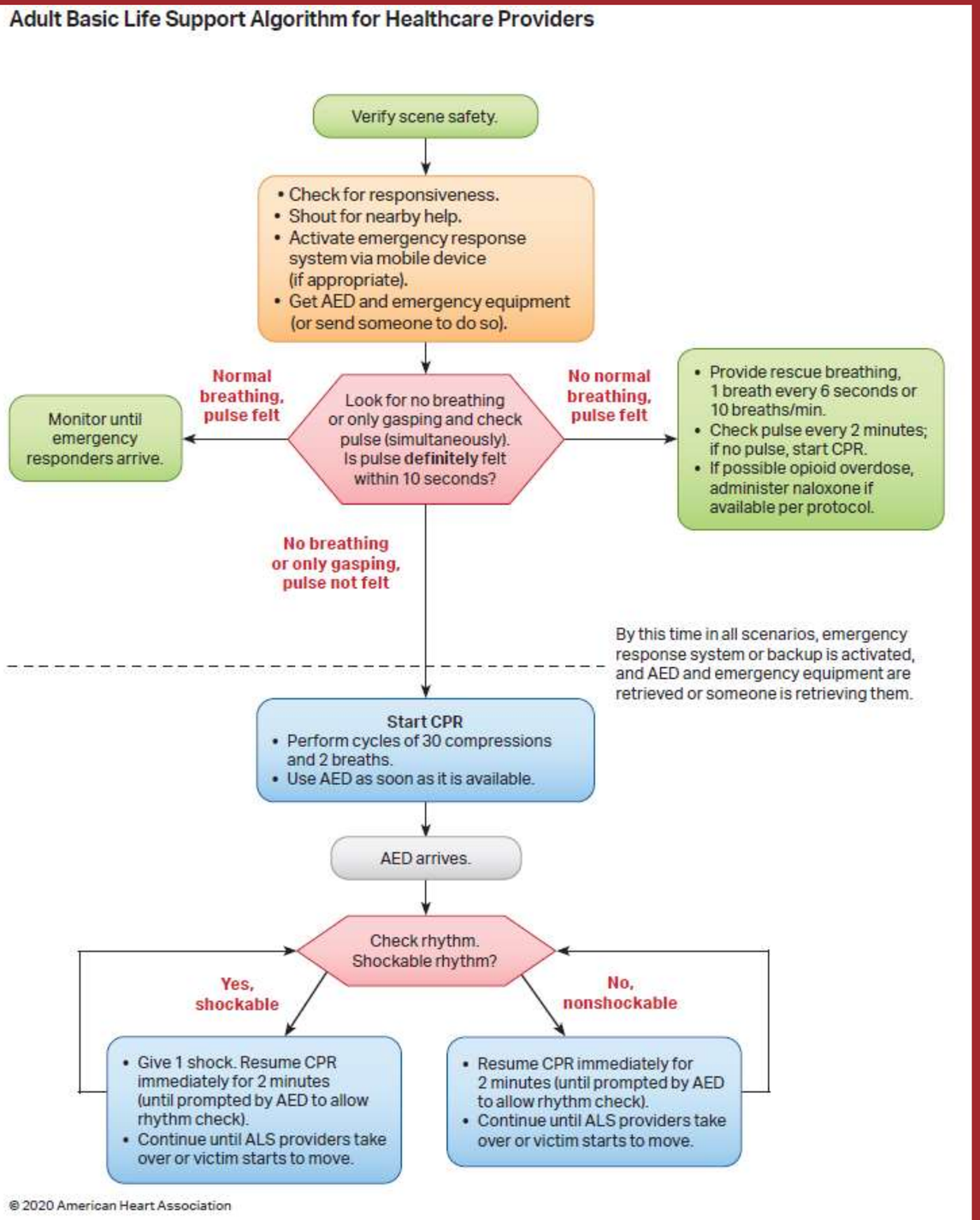
1. Check for a response – Shout "Are you okay?!" Do not be afraid to yell. This is the first assessment in BLS and ACLS: Does the patient need help emergently? If they do not respond, they need help immediately. If they do respond, they still may need medical attention.
2. Call for help – Yell for help, telling others to call 911 and to bring an AED. Be authoritative and do not panic. It is always best to have help. It is rare for only one responder to be available during BLS. If you are truly alone, you may consider leaving the patient briefly so that you can get help.
3. Check circulation – In adults, the best place to check for a pulse is the carotid artery. In children, the brachial or femoral arteries are first choices. Do not check for a pulse for more than 10 seconds. If you have not felt a pulse within 10 seconds, assume that the patient has no pulse. **Start chest compressions immediately.**
4. Check rhythm – This step requires an AED. Follow all prompts from the AED. If the cardiac rhythm is shockable, then clear everyone from the patient and deliver a shock. If the cardiac rhythm is not shockable, continue high-quality CPR.

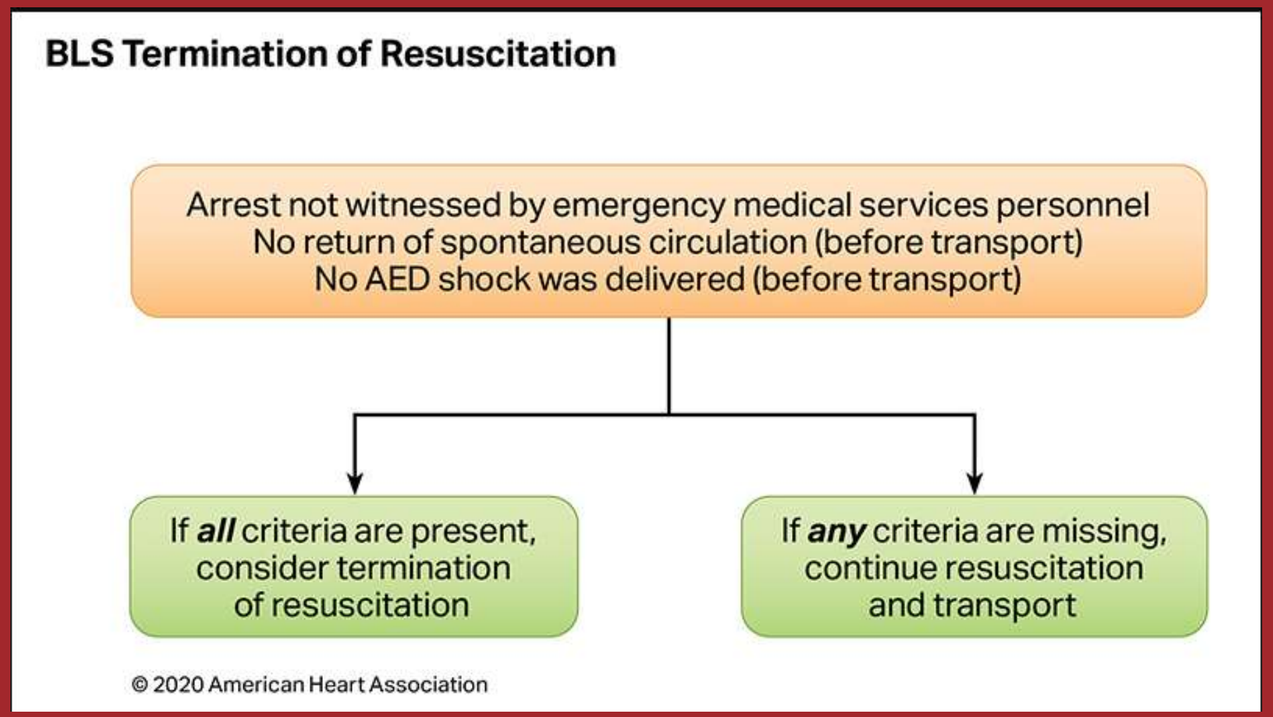


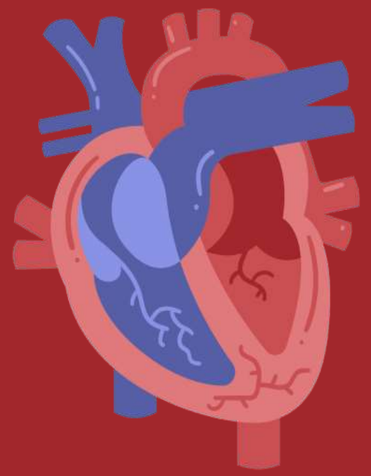

Reasons for the best efficacy of chest compression-only CPR include a better willingness to start CPR by bystanders, the low quality of mouth-to-mouth ventilation and a detrimental effect of too long interruptions of chest compressions during ventilation.

Based on our findings, compression-only CPR should be recommended as the preferred CPR technique performed by untrained bystander.

# Rescuer Adult BLS



# Cardiac Arrest in Pregnancy In-Hospital ACLS Algorithm

**Continue BLS/ACLS**
- High-quality CPR
- Defibrillation when indicated
- Other ACLS interventions (eg, epinephrine)

↓

**Assemble maternal cardiac arrest team**

↓

**Consider etiology of arrest**

↓

**Perform maternal interventions**
- Perform airway management
- Administer 100% $O_2$, avoid excess ventilation
- Place IV above diaphragm
- If receiving IV magnesium, stop and give calcium chloride or gluconate

↓

**Continue BLS/ACLS**
- High-quality CPR
- Defibrillation when indicated
- Other ACLS interventions (eg, epinephrine)

**Perform obstetric interventions**
- Provide continuous lateral uterine displacement
- Detach fetal monitors
- Prepare for perimortem cesarean delivery

↓

**Perform perimortem cesarean delivery**
- If no ROSC in 5 minutes, consider immediate perimortem cesarean delivery

↓

**Neonatal team to receive neonate**



## Maternal Cardiac Arrest

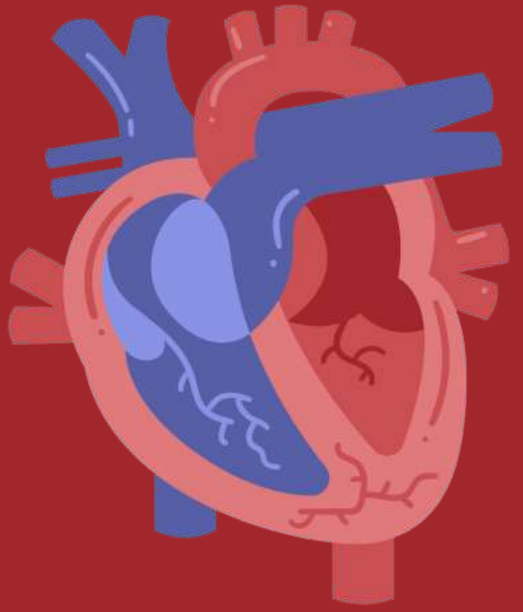
- Team planning should be done in collaboration with the obstetric, neonatal, emergency, anesthesiology, intensive care, and cardiac arrest services.
- Priorities for pregnant women in cardiac arrest should include provision of high-quality CPR and relief of aortocaval compression with lateral uterine displacement.
- The goal of perimortem cesarean delivery is to improve maternal and fetal outcomes.
- Ideally, perform perimortem cesarean delivery in 5 minutes, depending on provider resources and skill sets.

## Advanced Airway

- In pregnancy, a difficult airway is common. Use the most experienced provider.
- Provide endotracheal intubation or supraglottic advanced airway.
- Perform waveform capnography or capnometry to confirm and monitor ET tube placement.
- Once advanced airway is in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions.

## Potential Etiology of Maternal Cardiac Arrest

**A** Anesthetic complications
**B** Bleeding
**C** Cardiovascular
**D** Drugs
**E** Embolic
**F** Fever
**G** General nonobstetric causes of cardiac arrest (H's and T's)
**H** Hypertension



# Recovery position (lateral recumbent or 3/4 prone position)

This position is used to maintain a patent airway in the unconscious person.

- place the patient close to a true lateral position with the head dependent to allow fluid to drain.
- Assure the position is stable.
- Avoid pressure of the chest that could impairs breathing.
- Position patient in such a way that it allows turning them onto their back easily.
- Take precautions to stabilize the neck in case of cervical spine injury.
- Continue to assess and maintain access of airway.
- Avoid the recovery position if it will sustain injury to the patient.

ROSC


→ **Keep checking that they are breathing** by feeling their breath on the back of your hand.

→ Get the emergency services on the way if they haven't already been called.

→ **NB:** *A pregnant lady in the third trimester should be placed on their left hand side to prevent occlusion of the inferior vena cava.*

IHCA


OHCA


Child BLS

# Pediatric BLS for Lay Rescuers

## STEP 1

**Make sure the scene is safe.**

**Check to see if the person is awake and breathing normally.**

## STEP 2

**Shout for help.**

**If you're alone**

- **With a cell phone,** phone 9-1-1, perform CPR (30 compressions and then 2 breaths) for 5 cycles, and then get an AED
- **Without a cell phone,** perform CPR (30 compressions and then 2 breaths) for 5 cycles, and then phone 9-1-1 and get an AED

**If help is available, phone 9-1-1. Start CPR while you send someone to get an AED.**

## STEP 3

**Repeat cycles of 30 compressions and then 2 breaths.**

- **Child CPR**

  Push in the middle of the chest at least one third the chest depth or approximately 2 inches with 1 or 2 hands.

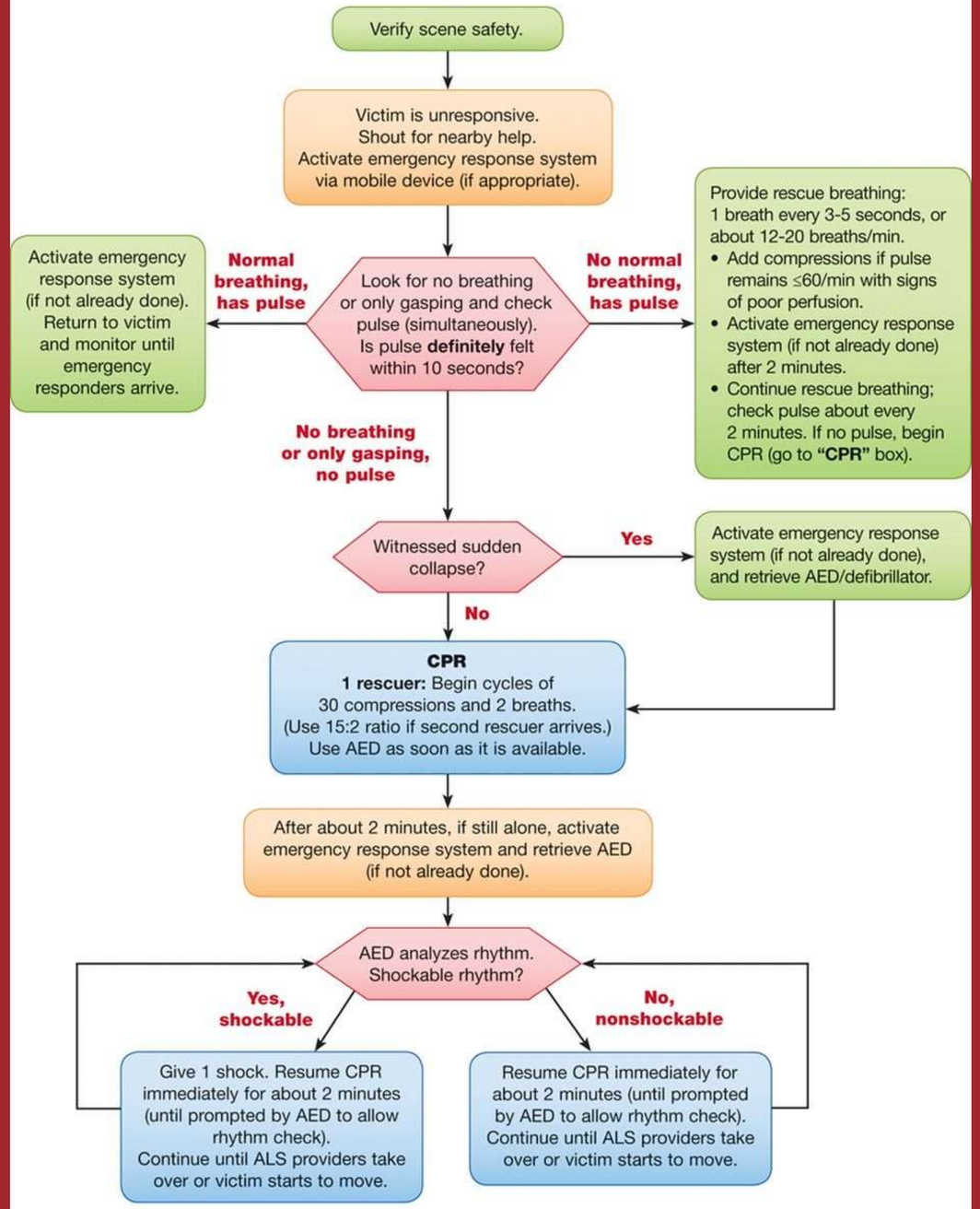
- **Infant CPR**

  Push in the middle of the chest at least one third the chest depth or approximately 1½ inches with 2 fingers.

**Use the AED as soon as it arrives.**

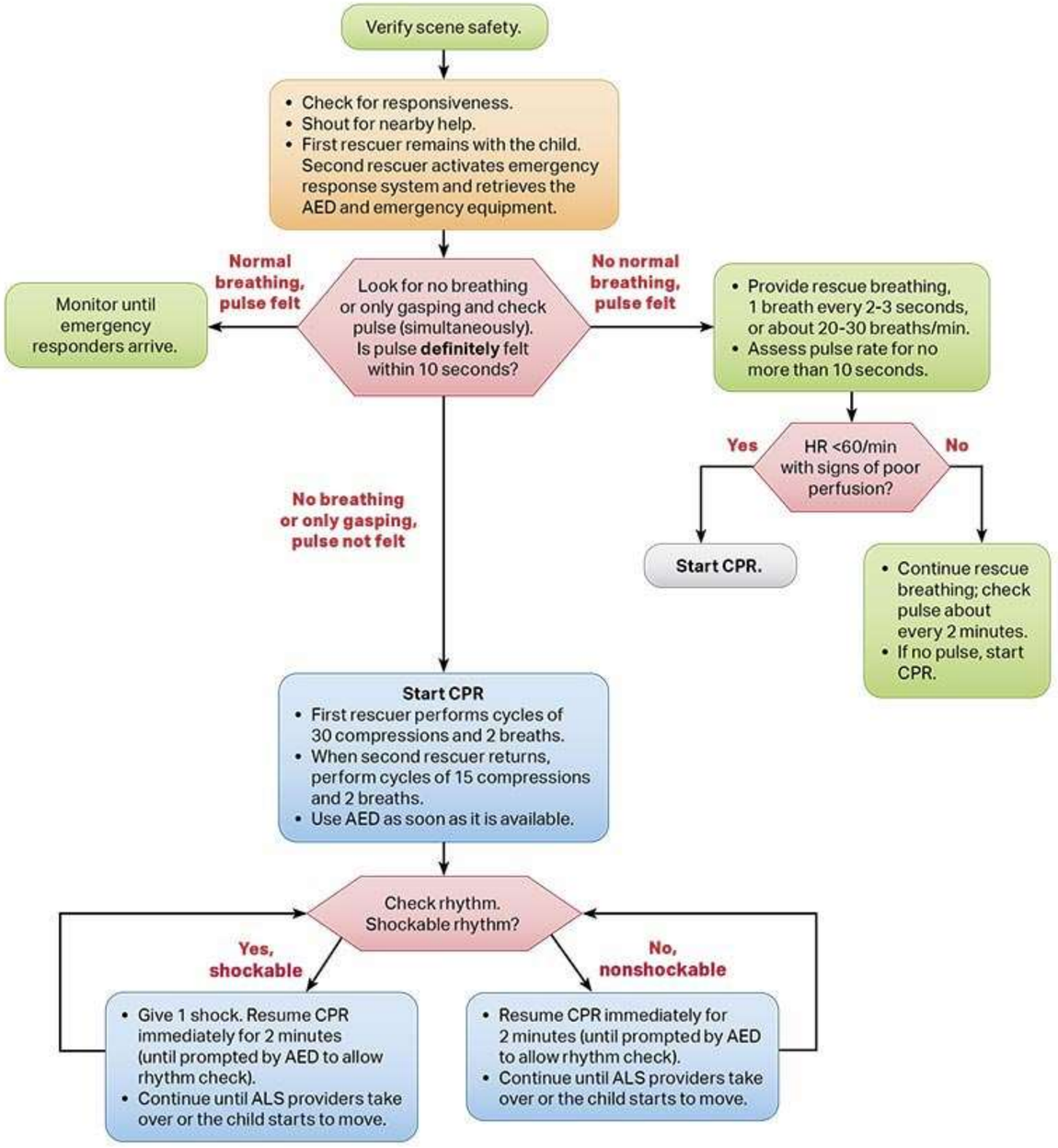
**Continue CPR until EMS arrives.**

## BLS Healthcare Provider
## Pediatric Cardiac Arrest Algorithm for the Single Rescuer—2015 Update






## Pediatric Basic Life Support Algorithm for Healthcare Providers—2 or More Rescuers



**Option 1:** Hold the baby in your arms, on their side, head lower than stomach. Put the back of your hand under their mouth and nose to keep checking that they are breathing. If you are unsure, wet the back of your hand as it makes it more sensitive. Call an ambulance.

**Option 2:** Roll them into the recovery position on a blanket or coat to insulate them from the ground and use a rolled-up jumper or something to keep them on their side. Keep checking that they're breathing. Call an ambulance.

*If the patient has a pulse and no CPR is required:*

- Provide 12-20 rescue breaths per minute.
- Recheck pulse every 2 minutes.

# Relief of Choking Adult

## Choking In Adults And Children

| DEGREE OF OBSTRUCTION | PERSON'S RESPONSE | RESCUERS ACTION |
|---|---|---|
| Mild Obstruction | • Breathing but may also be wheezing<br>• Coughing and making noise | • Stay with the person, try to keep them calm<br>• Encourage them to cough<br>• Call 911/EMS if the person seems to be getting worse |
| Severe Obstruction | • Clutching the neck (universal sign of choking; *Figure 15*).<br>• Weak or no cough<br>• Unable to make noise or talk; may make high-pitched noise<br>• Little or no breathing<br>• Appears cyanotic (blue around lips and fingertips) | • Use abdominal thrusts to attempt to remove obstruction<br>• Call 911/EMS<br>• Begin BLS if the person becomes unresponsive |


*Figure 16: Abdominal Thrusts*

## Abdominal Thrusts

These steps should only be used when a person is responsive and older than one year of age.

To properly perform the abdominal thrusts, do the following:

1. Stand behind the responsive person. Wrap your arms around their waist under their ribcage.
2. Put the side of your fist above the person's navel in the middle of their belly. Do not press on the lower part of the sternum *(Figure 16a)*.
3. With your other hand, hold the first fist and press forcefully into the person's abdomen and up toward their chest *(Figure 16b and 16c)*.
4. Continue performing these thrusts until the obstruction is relieved or until the person becomes unresponsive.

***If you can see a foreign object in the individual's mouth and can easily remove it, then do it. Watch and feel for breathing to begin. If the individual does not begin breathing, continue to provide CPR and rescue breaths until help arrives.***

Choking In Infants

| DEGREE OF OBSTRUCTION | INFANTS'S RESPONSE | RESCUERS ACTION |
|---|---|---|
| Mild Obstruction | • Breathing but may also be wheezing<br>• May be coughing and making noise | • Stay with the infant, try to keep them calm<br>• Do not do a blind finger sweep<br>• Call 911/EMS if infant does not quickly clear the obstruction |
| Severe Obstruction | • Weak or no cough<br>• Unable to make noise; may make high-pitched noise<br>• Little or no breathing<br>• Appears cyanotic (blue around lips and fingertips) | • Use back blows/chest thrusts to attempt to remove obstruction<br>• Call 911/EMS<br>• Begin BLS if the infant becomes unresponsive<br>• Assess if obstruction is visible; if so, remove it |

# Relief of Choking Infant


*Figure 17*

## For chest compressions, do the following:

In a choking but responsive infant less than one-year-old, back blows and chest thrusts are used instead of abdominal thrusts. See *Table 4* for rescue actions for choking in infants. To provide back blows and chest thrusts, do the following:

1. Hold the infant in your lap.
2. Put the infant with their face down and their head lower than their chest; they should be resting on your forearm. Put your forearm on your thigh *(Figure 17a)*.
3. Support the infant's head and neck with your hand and be sure to avoid putting pressure on their throat.
4. Using the heel of your free hand, deliver five back blows between the infant's shoulder blades *(Figure 17b)*.
5. Using both hands and arms, turn the infant face up so they are now resting on your other arm; this arm should now be resting on your thigh *(Figure 17c)*.
6. Make sure the infant's head is lower than their chest.
7. Using the fingers of your free hand, provide up to five quick downward chest thrusts over the lower half of the breastbone *(Figure 17d)*. Perform one thrust every second.
8. If the obstruction is not relieved, turn the infant face down on your other forearm and repeat the process *(Figure 17b)*.
9. Continue doing these steps until the infant begins to breathe or becomes unresponsive.

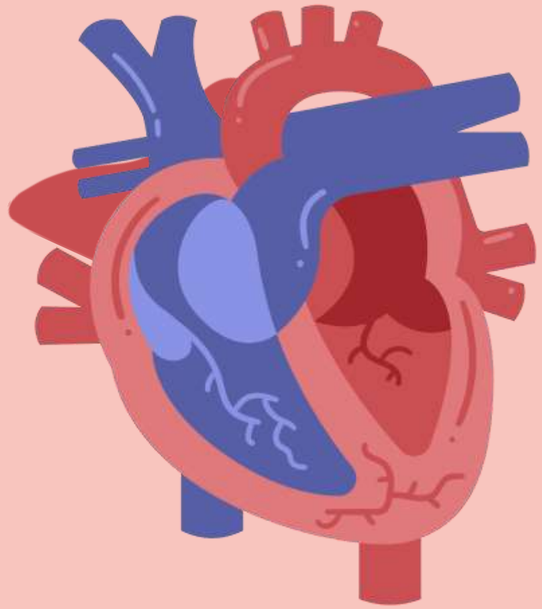

WHO?
WHY?
HOW?
WHAT?
WHERE?

# EVALUASI

1. Apa itu BLS secara tepat baik sendiri maupun dalam tim

2. Apa itu BLS dengan Automatic External Defibrilator (AED) pada pasien dewasa, anak, dan bayi

3. Apa itu tatalaksana obstruksi benda asing pada pasien dewasa, anak, dan bayi.

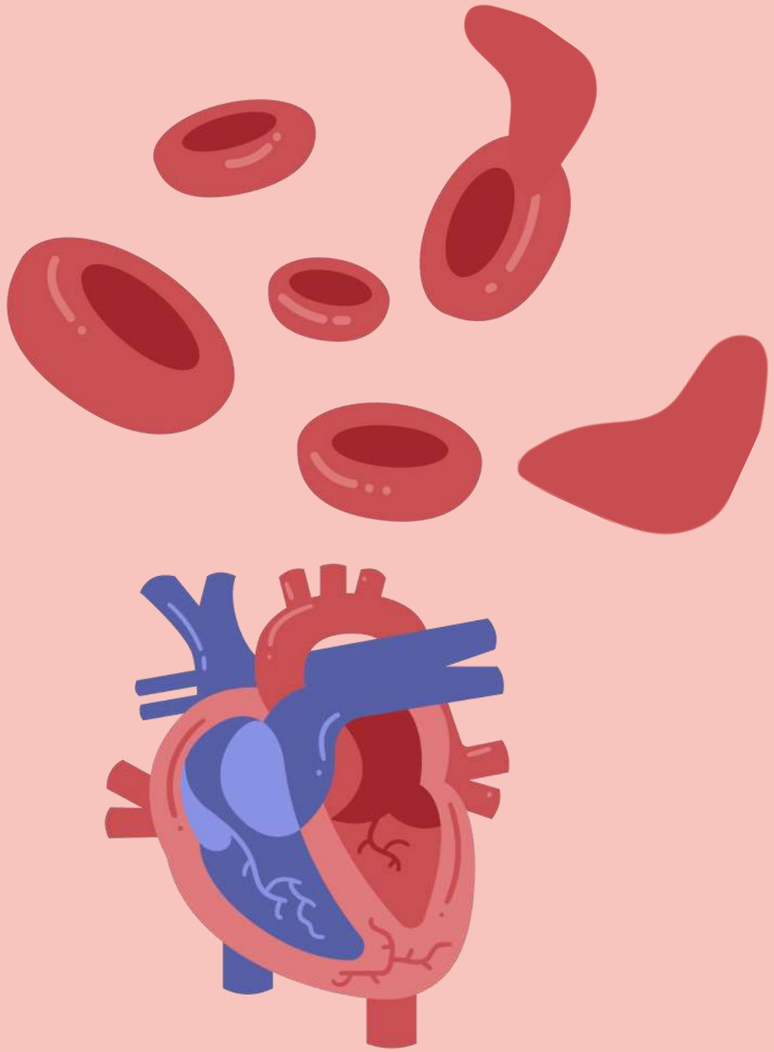


# KESIMPULAN

1. Memahami BLS secara tepat baik sendiri maupun dalam tim

2. Memahami BLS dengan Automatic External Defibrilator (AED) pada pasien dewasa, anak, dan bayi

3. Memahami tatalaksana obstruksi benda asing pada pasien dewasa, anak, dan bayi.

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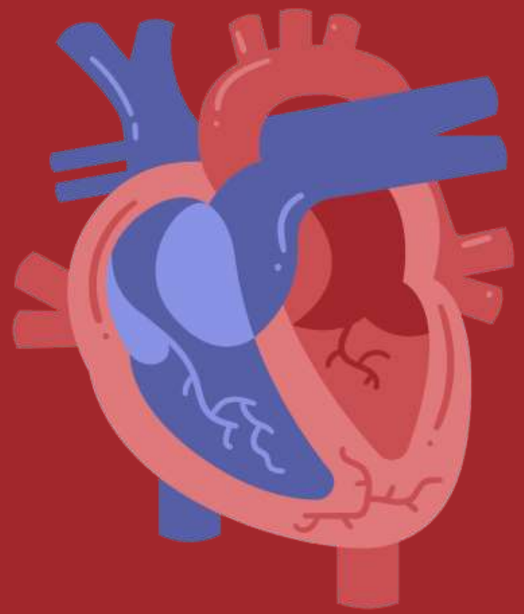
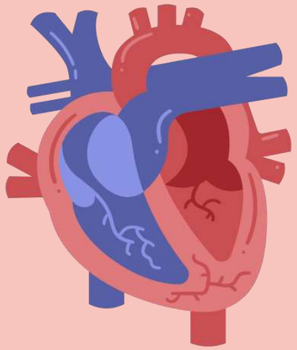
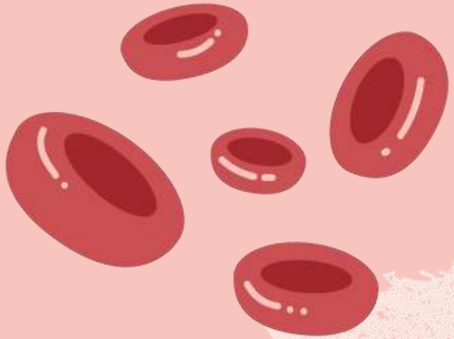
# UPDATE ADVANCED CARDIAC LIFE SUPPORT







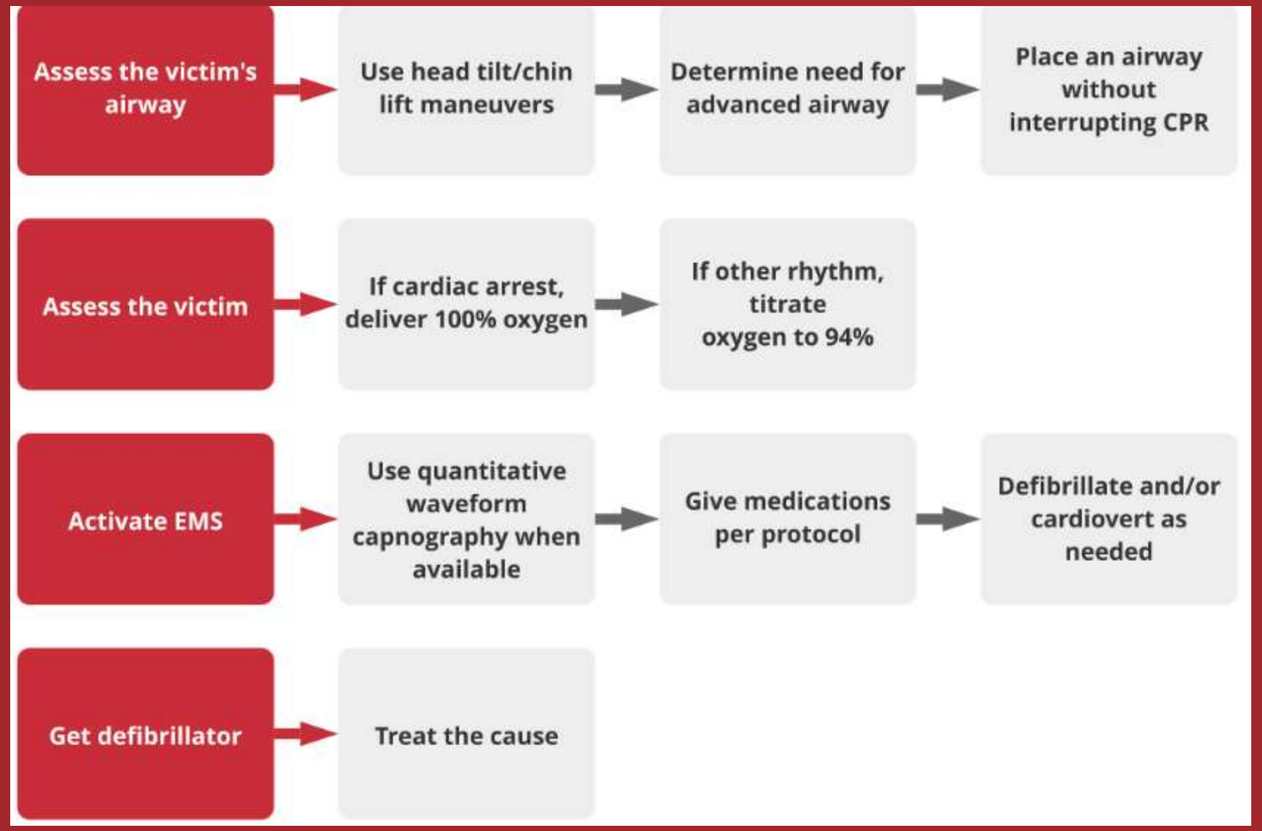
# TUJUAN PEMBELAJARAN

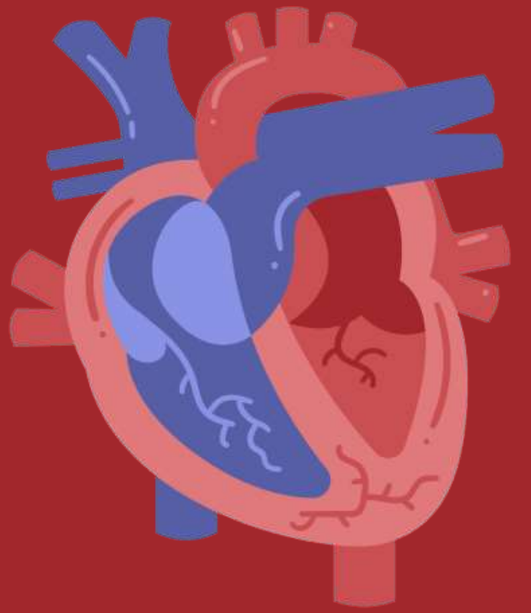
1. Mengerti Algoritme ACLS
2. Mengerti pengenalan tanda dan gejala secara dini dan tatalaksana sindrom koroner akut
3. Mengerti pengenalan tanda dan gejala secara dini dan tatalaksana stroke, termasuk pemindahan pasien secara tepat
4. Mengerti pendekatan tatalaksana keracunan opioid menurut algoritme ACLS
5. Mengenali bradikardia dan takikardia yang dapat bermuara dalam kondisi henti jantung atau menurunkan prognosis resusitasi

When the BLS survey is complete or if the patient is conscious and responsive, the responder should conduct the ACLS survey with a focus on identifying and treating the underlying cause(s) of the patient's problem.

The ACLS Survey follows A, B, C, and D: Airway, Breathing, Circulation, and Differential Diagnosis.

1. Assess Airway – Use the least advanced airway possible to maintain the airway and oxygenation (laryngeal mask, laryngeal tube, or esophageal tracheal tube).
2. Assess Breathing – Monitor tube placement and oxygenation using waveform capnography if available; avoid excessive ventilation.
3. Assess Circulation – Medications, CPR, fluids and defibrillation when needed according to the ACLS cases.
4. Determine Differential Diagnosis – Use an AED or defibrillator to identify the arrhythmia or symptoms and treat reversible causes.

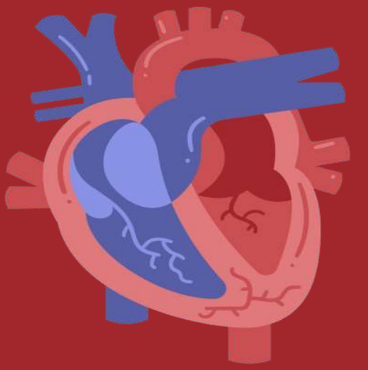


# The Systematic Approach Of ACLS


## BLS Assessment

Foundational to every ACLS Algorithm is the BLS Assessment. The BLS Assessment is the first step that you will take when treating any emergency situation, and there are 4 main assessment steps to remember.



This is an outline of the 4 steps in the BLS Assessment :

(1) **Check responsiveness** by tapping and shouting, “Are you all right?” Scan the patient for absent or abnormal breathing (scan 5-10 seconds).

(2) **Activate the emergency response system and obtain a AED**. If there is more than one rescuer, have the second person activate emergency response and get the AED/Defibrillator.

(3) **Circulation**: Check for a carotid pulse. This pulse check should not take more than 5-10 seconds. If no pulse is palpable begin CPR.

(4) **Defibrillation**: If there is no pulse, check for a shockable rhythm with the AED or defibrillator as soon as it arrives. Follow the instructions provided by the AED or begin ACLS Protocol.

For a more in-depth review of BLS refer to the American Heart Association’s BLS Provider Manual.

Remember to assess first then perform appropriate actions, and after each action…reassess.

# Primary Assessment for ACLS


The Primary Assessment uses the ABCDE model to systematize the assessment process. The ABCDE's of the Primary Assessment are:

(A) **Airway**: Maintain airway and use advanced airway if needed. Ensure confirmation of placement of an advanced airway and secure the advanced airway device.

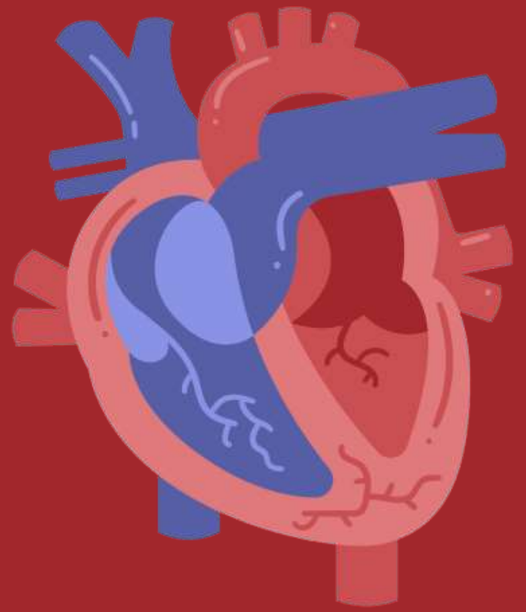
(B) **Breathing**: Give bag-mask ventilation, provide supplemental oxygen, and avoid excessive ventilation. Also, adequacy of ventilation and oxygenation should be monitored during this step.

(C) **Circulation**: Obtain IV access, attach ECG leads, identify and monitor arrhythmias, giving fluids if needed, and use defibrillation if appropriate.

(D) **Disability**: Perform a general neurological assessment which should include assessment of responsiveness, level of consciousness, and pupil reflex. AVPU acronym may help. (Alert, Voice, Painful, Unresponsive)

(E)**Exposure**: Ensure that clothing is removed so that a complete visual assessment can be performed. This visual assessment should include looking for signs of trauma, bleeding, burns, or medical alert bracelets.

The Primary Assessment is included in every ACLS algorithm and like the BLS Assessment, it helps to systematize the resuscitation process and improve patient outcomes.



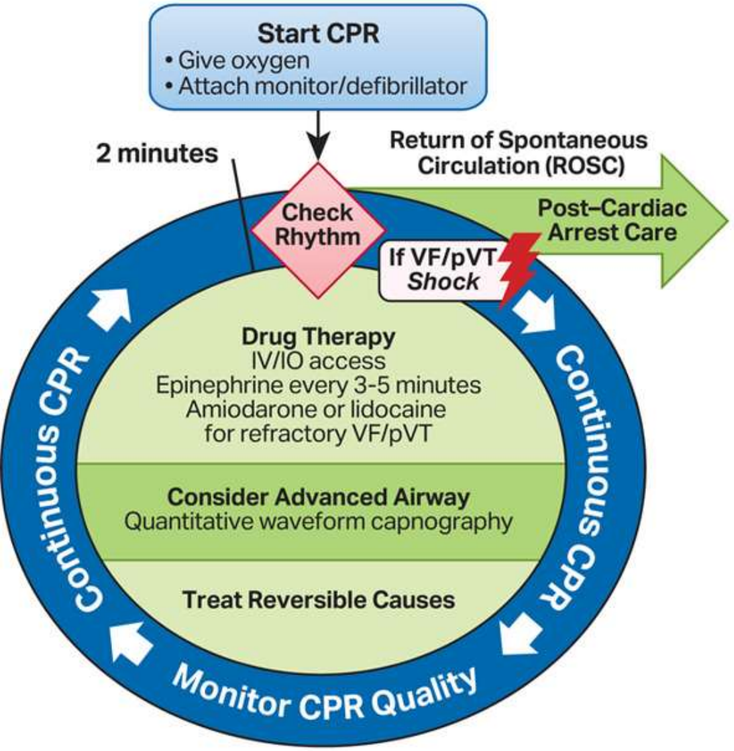
# Secondary Assessment for ACLS


The secondary assessment includes a search for underlying causes for the emergency and if possible a focused medical history. This search for for underlying causes, also known as differential diagnosis, requires a review of all of the H's and T's of ACLS. Visit H's and T's page for a full review.

Performing the focused medical history can be simplified using the acronym SAMPLE. **(S)**Signs and symptoms; **(A)**Allergies; **(M)**Medications; **(P)**Past Illnesses; **(L)**Last Oral Intake; **(E)**Events Leading Up To Present Illness.

# cardiac arrest algoritme

## 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 $P_{ETCO_2}$ is low or decreasing, reassess CPR quality.

### 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.

### 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

### Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in $P_{ETCO_2}$ (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

### Reversible Causes

- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypo-/hyperkalemia
- **H**ypothermia
- **T**ension pneumothorax
- **T**amponade, cardiac
- **T**oxins
- **T**hrombosis, pulmonary
- **T**hrombosis, coronary



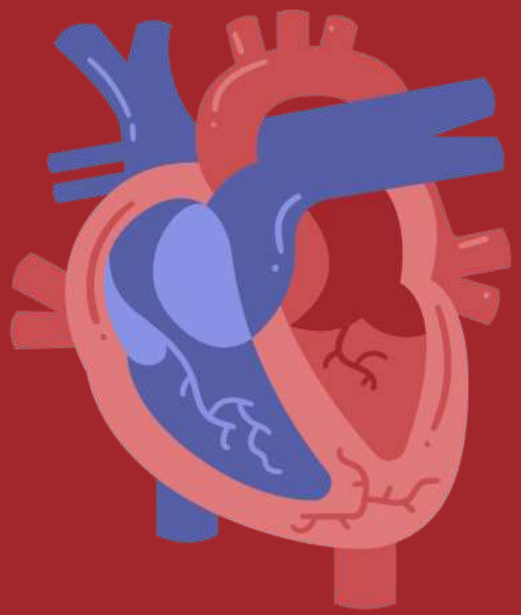
## H's of ACLS

| Causes | Signs | Treatment |
|---|---|---|
| Hypovolemia | -Rapid heart rate<br>-Narrow QRS<br>-Blood loss | -Obtain IO/IV Access<br>-Administer fluid/blood<br>-Use fluid challenge |
| Hypoxia/ Hypoxemia | -Slow heart rate<br>-Cyanosis | -Ensure airway is open<br>-Ventilate<br>-Ensure oxygen supply is adequate |
| Hydrogen Ion Excess (Acidosis) | -Low amplitude QRS complex | -Atriel blood gas<br>-Provide adequate ventilations<br>-Sodium bicarbonate (metabolic) |
| Hypokalemia/ Hyperkalemia | -Flattened T waves & a U wave (Hypokalemia)<br>-Peaked T waves & a widened QRS (Hyperkalemia) | -Ventilate (respiratory)<br>-Sodium bicarbonate (metabolic) |
| Hypothermia | -Shivering<br>-Previous exposure to cold temperatures | -Active warming measures<br>-Temperature should be above 30°C |

## T's of ACLS

| Causes | Signs | Treatment |
|---|---|---|
| Tamponade (Cardiac) | -Rapid heart rate<br>-Narrow QRS<br>-JVD<br>-No pulse<br>-Muffled heart sounds | -Pericardiocentesis<br>-Thoracotomy |
| Toxins | -Prolonged QT interval | -Based on overdose agent<br>-Supportive care |
| Tension Pneumothorax | -Slow heart rate<br>-Narrow QRS<br>-Unequal breathing<br>-JVD<br>-Tracheal deviation | -Needle decompression<br>-Insertion of a chest tube |
| Thrombosis (Pulmonary) | -Rapid heart rate<br>-Narrow QRS<br>-Shortness of breath<br>-Decreased oxygen<br>-Chest pain | -Embolectomy<br>-Fibrinolytic therapy<br>-Anticoagulant therapy |
| Thrombosis (Coronary) | -Abnormal ECG | -Angioplasty<br>-Stent placement<br>-Coronary bypass surgery |

# PEDIATRIC CARDIAC ARREST ALGORITME



## Pediatric Cardiac Arrest Algorithm

1 **Start CPR**
- Begin bag-mask ventilation and give oxygen
- Attach monitor/defibrillator

**Rhythm shockable?**

**Yes**

2 **VF/pVT**

3 **Shock**

4 **CPR 2 min**
IV/IO access

**Rhythm shockable?**

**No**

**Yes**

5 **Shock**

6 **CPR 2 min**
- **Epinephrine** every 3-5 min
- Consider advanced airway

**Rhythm shockable?**

**No**

**Yes**

7 **Shock**

8 **CPR 2 min**
- **Amiodarone** or **lidocaine**
- Treat reversible causes

**No**

9 **Asystole/PEA**

**Epinephrine ASAP**

10 **CPR 2 min**
- IV/IO access
- **Epinephrine** every 3-5 min
- Consider advanced airway and capnography

**Rhythm shockable?**

**Yes**

**No**

11 **CPR 2 min**
Treat reversible causes

**Rhythm shockable?**

**No**

**Yes**

12
- If no signs of return of spontaneous circulation (ROSC), go to **10**
- If ROSC, go to Post–Cardiac Arrest Care checklist

Go to **7**.

### CPR Quality
- Push hard (≥⅓ of anteroposterior diameter of chest) and fast (100–120/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Change compressor every 2 minutes, or sooner if fatigued
- If no advanced airway, 15:2 compression-ventilation ratio
- If advanced airway, provide continuous compressions and give a breath every 2–3 seconds

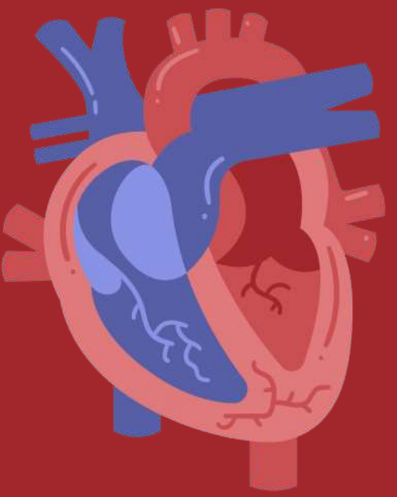
### Shock Energy for Defibrillation
- First shock 2 J/kg
- Second shock 4 J/kg
- Subsequent shocks ≥4 J/kg, maximum 10 J/kg or adult dose

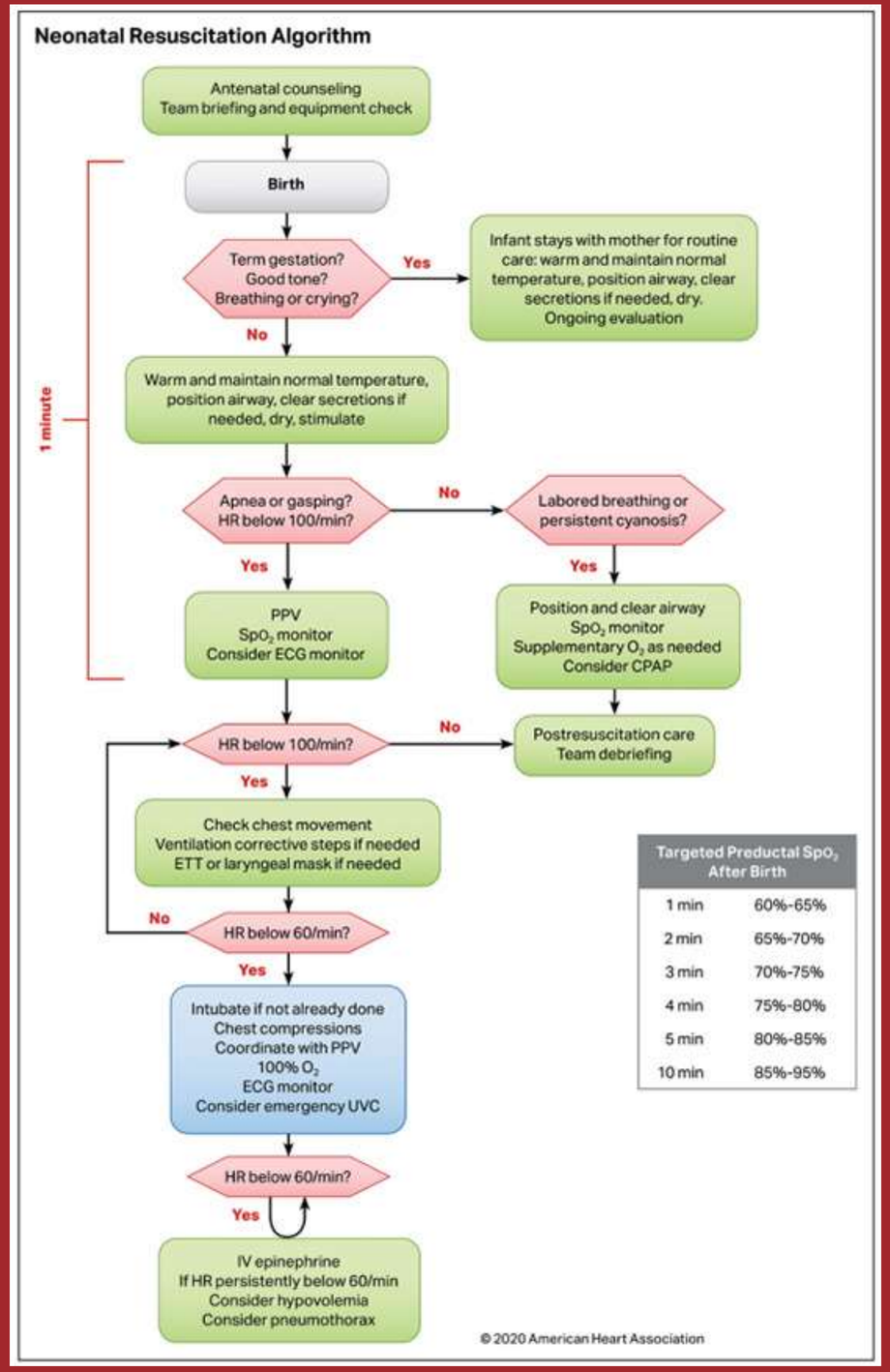
### Drug Therapy
- **Epinephrine IV/IO dose:** 0.01 mg/kg (0.1 mL/kg of the 0.1 mg/mL concentration). Max dose 1 mg. Repeat every 3-5 minutes. If no IV/IO access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of the 1 mg/mL concentration).
- **Amiodarone IV/IO dose:** 5 mg/kg bolus during cardiac arrest. May repeat up to 3 total doses for refractory VF/pulseless VT
  or
  **Lidocaine IV/IO dose:** Initial: 1 mg/kg loading dose

### Advanced Airway
- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement

### Reversible Causes
- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypoglycemia
- **H**ypo-/hyperkalemia
- **H**ypothermia
- **T**ension pneumothorax
- **T**amponade, cardiac
- **T**oxins
- **T**hrombosis, pulmonary
- **T**hrombosis, coronary

# NEONATAL CARDIAC ARREST ALGORITME






## APGAR SCORING SYSTEM

| | 0 Points | 1 Point | 2 Points | Points totaled |
|---|---|---|---|---|
| Activity (muscle tone) | Absent | Arms and legs flexed | Active movement | |
| Pulse | Absent | Below 100 bpm | Over 100 bpm | |
| Grimace (reflex irritability) | Flaccid | Some flexion of Extremities | Active motion (sneeze, cough, pull away) | |
| Appearance (skin color) | Blue, pale | Body pink, Extremities blue | Completely pink | |
| Respiration | Absent | Slow, irregular | Vigorous cry | |

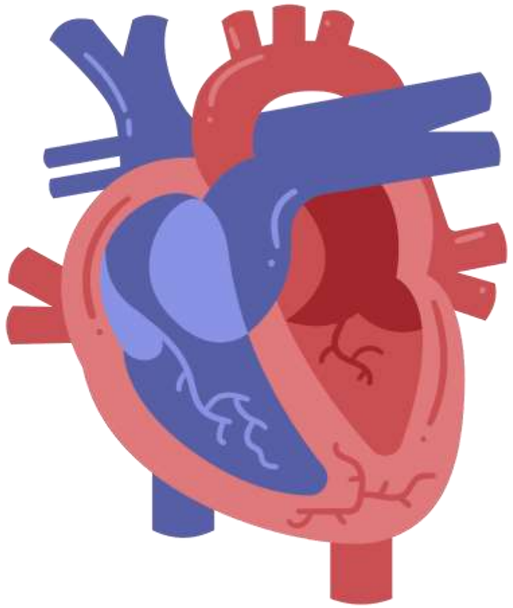
| | |
|---|---|
| Severely depressed | 0-3 |
| Moderately depressed | 4-6 |
| Excellent condition | 7-10 |

## Causes of Low APGAR Scores

- Fetal heart rate monitoring errors
- Maternal medical conditions
- Infections
- Placental abruption
- Preterm or premature birth
- Prolonged labour
- C-section delays
- Umbilical cord problems
- Uterine hyperstimulation during induction of labour
- Uterine rupture

APGAR score below 7 →needs medical attention and may have suffered from insufficient oxygenation during labour and delivery
The lower an APGAR score is, the more assistance that the baby needs to adjust to breathing independently outside of the womb.

# NEONATAL CARDIAC ARREST ALGORITME



**Top 10 Take-Home Messages for Neonatal Life Support**

**1.** Newborn resuscitation requires anticipation and preparation by providers who train individually and as teams.

**2.** Most newly born infants do not require immediate cord clamping or resuscitation and can be evaluated and monitored during skin-to-skin contact with their mothers after birth.

**3.** Inflation and ventilation of the lungs are the priority in newly born infants who need support after birth.

**4.** A rise in heart rate is the most important indicator of effective ventilation and response to resuscitative interventions.

**5.** Pulse oximetry is used to guide oxygen therapy and meet oxygen saturation goals.

**6.** Chest compressions are provided if there is a poor heart rate response to ventilation after appropriate ventilation corrective steps, which preferably include endotracheal intubation.

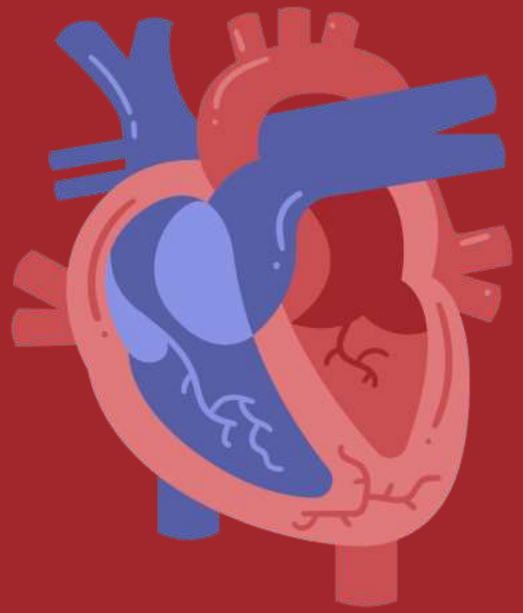
**7.** The heart rate response to chest compressions and medications should be monitored electrocardiographically.

**8.** If the response to chest compressions is poor, it may be reasonable to provide epinephrine, preferably via the intravenous route.

**9.** Failure to respond to epinephrine in a newborn with history or examination consistent with blood loss may require volume expansion.

**10.** If all these steps of resuscitation are effectively completed and there is no heart rate response by 20 minutes, redirection of care

# Acute Coronary Syndromes



## ACUTE CORONARY SYNDROMES ALGORITHM

ProMed CERTIFICATIONS

**Patient has signs suggestive of ischemia or infarction**

**EMS ASSESSMENT, CARE, AND HOSPITAL PREPARATION**

1. **MONITOR & SUPPORT ABC'S**
   > Prepare to provide CPR or defibrillate if needed
2. **ADMINISTER ASPIRIN**
   > Consider oxygen, nitroglycerin, and morphine
3. **OBTAIN 12-LEAD ECG: INTERPRET/TRANSMIT**
   > If ST elevation, note time of onset and first medical contact and notify receiving hospital.
4. **STEMI RESPONSE**
   > Notified hospital should mobilize hospital resources
5. **COMPLETE FIBRINOLYTIC CHECKLIST**
   > If considering prehospital fibrinolysis, use fibrinolytic checklist

**CONCURRENT ED ASSESSMENT (<10 MINUTES)**

- CHECK VITAL SIGNS & OXYGEN SAT
- ESTABLISH IV ACCESS
- BRIEF HISTORY & PHYSICAL
- OBTAIN INITIAL CARDIAC MARKERS
  > And initial electrolyte and coagulation studies
- PORTABLE CHEST X-RAY (<30 MIN)

**IMMEDIATE ED GENERAL TREATMENT**

- START OXYGEN
  > At 4 L/min, titrate if $O_2$ sat <90%
- ADMINISTER ASPIRIN
  > 160 to 325 mg (if not given by EMS)
- ADMINISTER NITOGLYCERIN
  > Sublingual or spray
- ADMINISTER MORPHINE IV
  > If nitroglycerin doesn't relieve discomfort

**ECG Interpretation**

**ST-Elevation MI (STEMI)**
ST elevation or new or presumably new LBBB; strongly suspicious for injury

- Start adjunctive therapies as indicated
- Don't delay reperfusion

**Time from onset of symptoms is:**

- *≤ 12 Hours*
- *≥ 12 Hours*

**Reperfusion Goals:**
*Therapy defined by patient & center criteria*

- Door-to-balloon inflation (PCI)
  > Goal: 90 Minutes
- Door-to-needle fibrinolysis
  > Goal: 30 Minutes

**High-Risk Non-ST-Elevation ACS**
ST depression or dynamic T-wave inversion; strongly suspicious for ischemia

**Troponin Elevated OR High-Risk Patient**

- Consider Early invasive strategy if:
  > Refractory ischemic chest discomfort
  > Recurrent / persistent ST deviation
  > Ventricular tachycardia
  > Hemodynamic instability
  > Signs of heart failure
- Start Adjunctive Therapies:
  > eg. Nitroglycerin, heparin as indicated
  > See AHA/ACC NSTE-ACS guidelines

**Low/Intermediate-Risk ACS**
Normal or nondiagnostic changes in ST segment or T wave

**Admission OR Monitoring**
Consider admission to ED chest pain unit or to appropriate bed for further monitoring and possible intervention

This Algorithm is based on the latest (2020) American Heart Association standards and guidelines

# Acute Stroke

## SUSPECTED STROKE ALGORITHM

ProMed CERTIFICATIONS

**NINDS Time Goals**

- ED Arrival 10 MIN
- ED Arrival 25 MIN
- ED Arrival 45 MIN
- ED Arrival 60 MIN
- ED Arrival 3 HOURS

**Activate Emergency Response (EMS)**
Identify signs and symptoms of possible stroke

**CRITICAL EMS ASSESSMENTS AND ACTIONS**

1. SUPPORT ABC'S — Give oxygen if needed
2. PREHOSPITAL STROKE ASSESSMENT
3. ESTABLISH TIME OF SYMPTOM ONSET — When they were last normal
4. TRIAGE TO STROKE CENTER
5. ALERT HOSPITAL — Consider direct transfer to CT scan
6. CHECK GLUCOSE IF POSSIBLE

**IMMEDIATE GENERAL ASSESSMENT AND STABILIZATION**

- ASSESS ABC'S, VITAL SIGNS
- PROVIDE OXYGEN IF HYPOXEMIC
- IV ACCESS AND LAB ASSESSMENTS
- CHECK GLUCOSE; TREAT IF INDICATED
- NEUROLIGIC SCREENING ASSESSMENT
- ACTIVATE STROKE TEAM
- ORDER EMERGENT CT SCAN OR MRI OF BRAIN
- OBTAIN 12-LEAD ECG

**IMMEDIATE NEUROLOGIC ASSESSMENT BY STROKE TEAM OR DESIGNEE**

- REVIEW PATIENT HISTORY
- ESTABLISH TIME OF SYMPTOM ONSET OR LAST KNOWN NORMAL
- PERFORM NEUROLOGIC EXAMINATION — NIH Stroke Scale or Canadian Neurological Scale

**Hemorrhage shown by CT Scan?**

No Hemorrhage → **Probable acute ischemic stroke** — Consider fibrinolytic therapy

Check for fibrinolytic exclusions and repeat neurologic exam

ASK: Are deficits rapidly improving to normal?

**Is patient a candidate for fibrinolytic therapy?**

Yes → **Review risks and benefits with patient and family**

- If acceptable:
  - > If acceptable:
  - > Give rtPA — Not anticoagulants or antiplatelet treatment for 24 hours

Then:
- Begin post-rtPA stroke pathway
- Aggressively Monitor:
  - > BP per protocol
  - > For neurologic deterioration
- Emergent admission to stroke unit or intensive care unit

No → **Consultation**

Consult neurologist or neurosurgeon and consider transfer if not available

Then:
- Begin stroke or hemorrhage pathway
- Admit to stroke or intensive care unit

Hemorrhage → **Initiate Intracranial hemorrhage protocol**

Then:
- Begin stroke or hemorrhage pathway
- Admit to stroke or intensive care unit

This Algorithm is based on the latest (2020) American Heart Association standards and guidelines



## SIRIRAJ STROKE SCORE

**=(2,5xS) + (2xM) + (2xN) + (0,1xD) – (3xA) – 12**

**S = SENSORIUM**
0 → COMPOS MENTIS
1 → SOMNOLEN
2 → SOPOR / KOMA

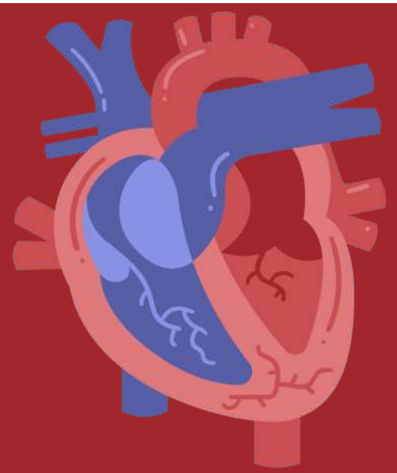
**M = MUNTAH**
0 → TIDAK ADA
1 → ADA

**N = NYERI KEPALA (DALAM 2 JAM)**
0 → TIDAK ADA
1 → ADA

**D = DIASTOLIK (mmHg)**

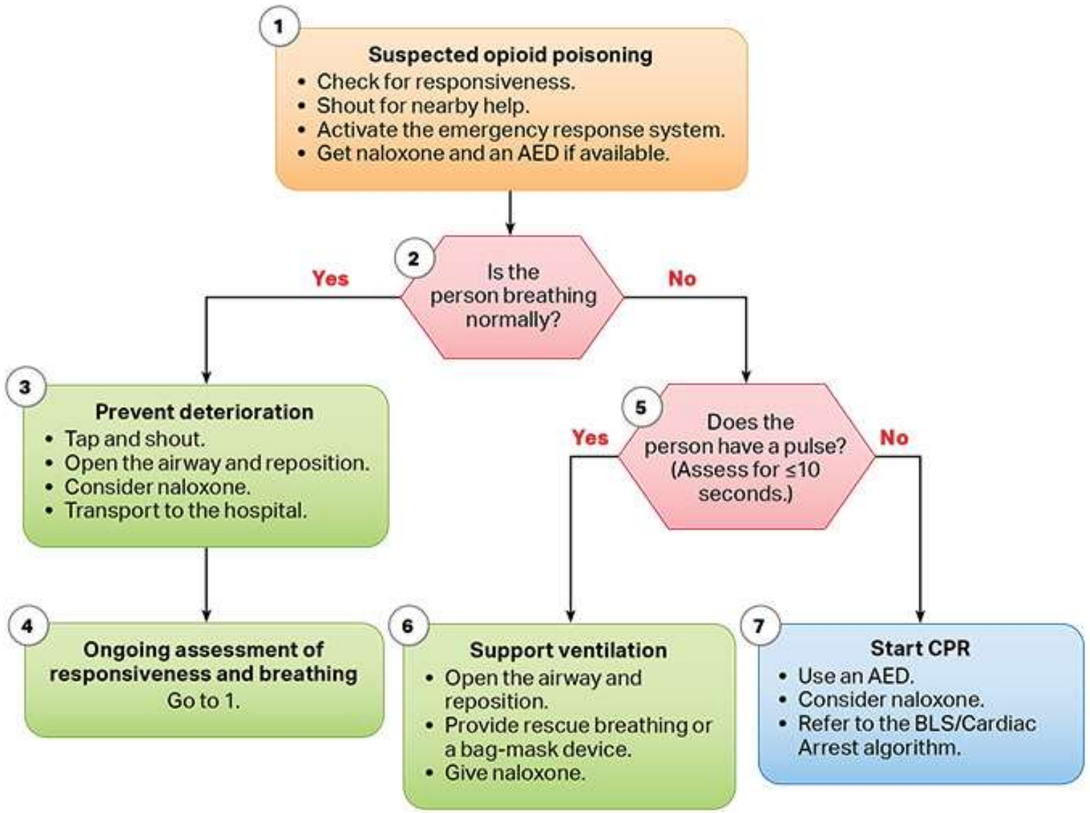
**A = ATEROMA**
**(DM, CLAUDICATIO INTERMITTEN, TANDA MENINGEAL, TANDA BABINSKI, HIPERTENSI, RIWAYAT STROKE SEBELUMNYA, PENYAKIT JANTUNG)**
0 → TIDAK ADA
1 → SALAH SATU ATAU LEBIH

**KETERANGAN :**
> +1 → PERDARAHAN SUPRATENTORIAL
< -1 → INFARK SEREBRI
-1 s/d +1 → MERAGUKAN



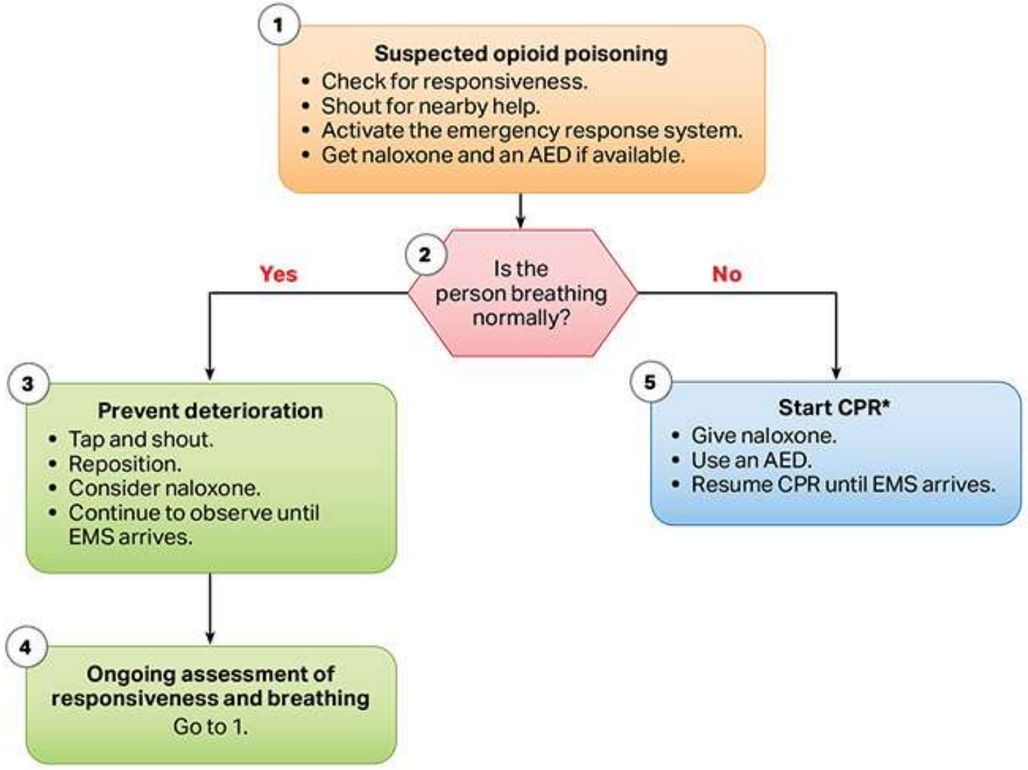
# Keracunan opioid

## Opioid-Associated Emergency for Healthcare Providers Algorithm



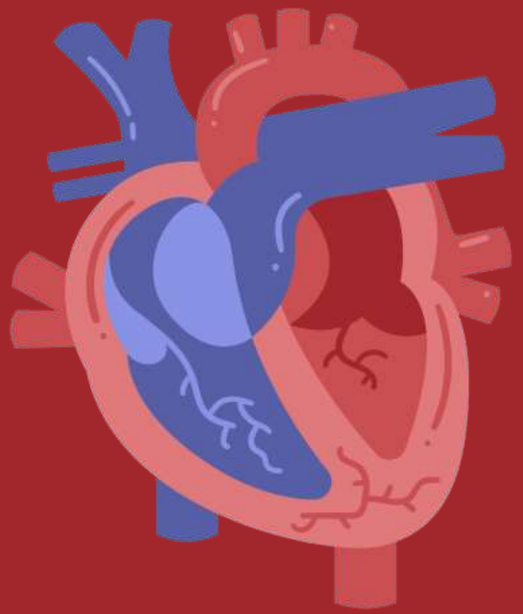



## Opioid-Associated Emergency for Lay Responders Algorithm

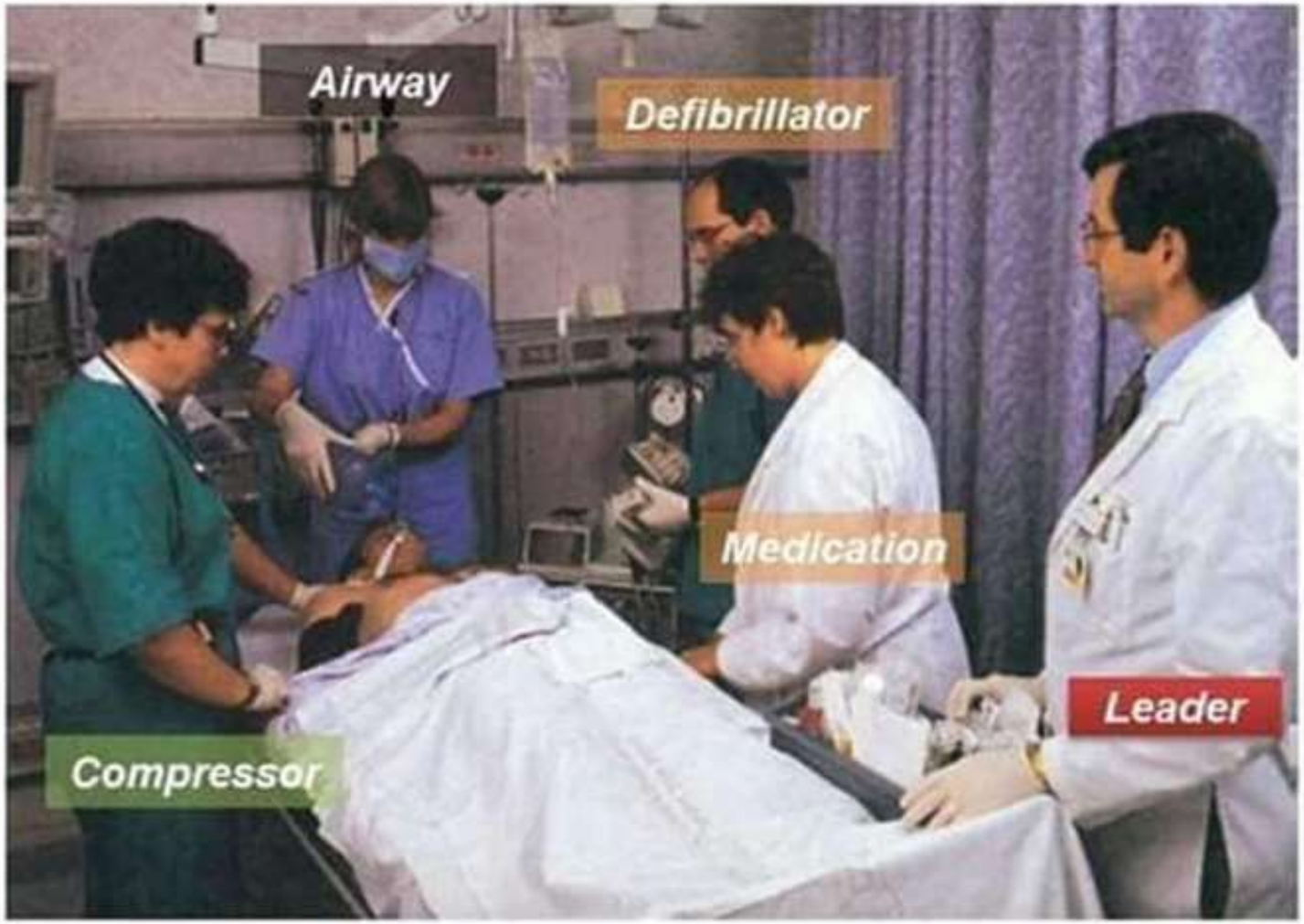



*For adult and adolescent victims, responders should perform compressions and rescue breaths for opioid-associated emergencies if they are trained and perform Hands-Only CPR if not trained to perform rescue breaths. For infants and children, CPR should include compressions with rescue breaths.

High Performance Team

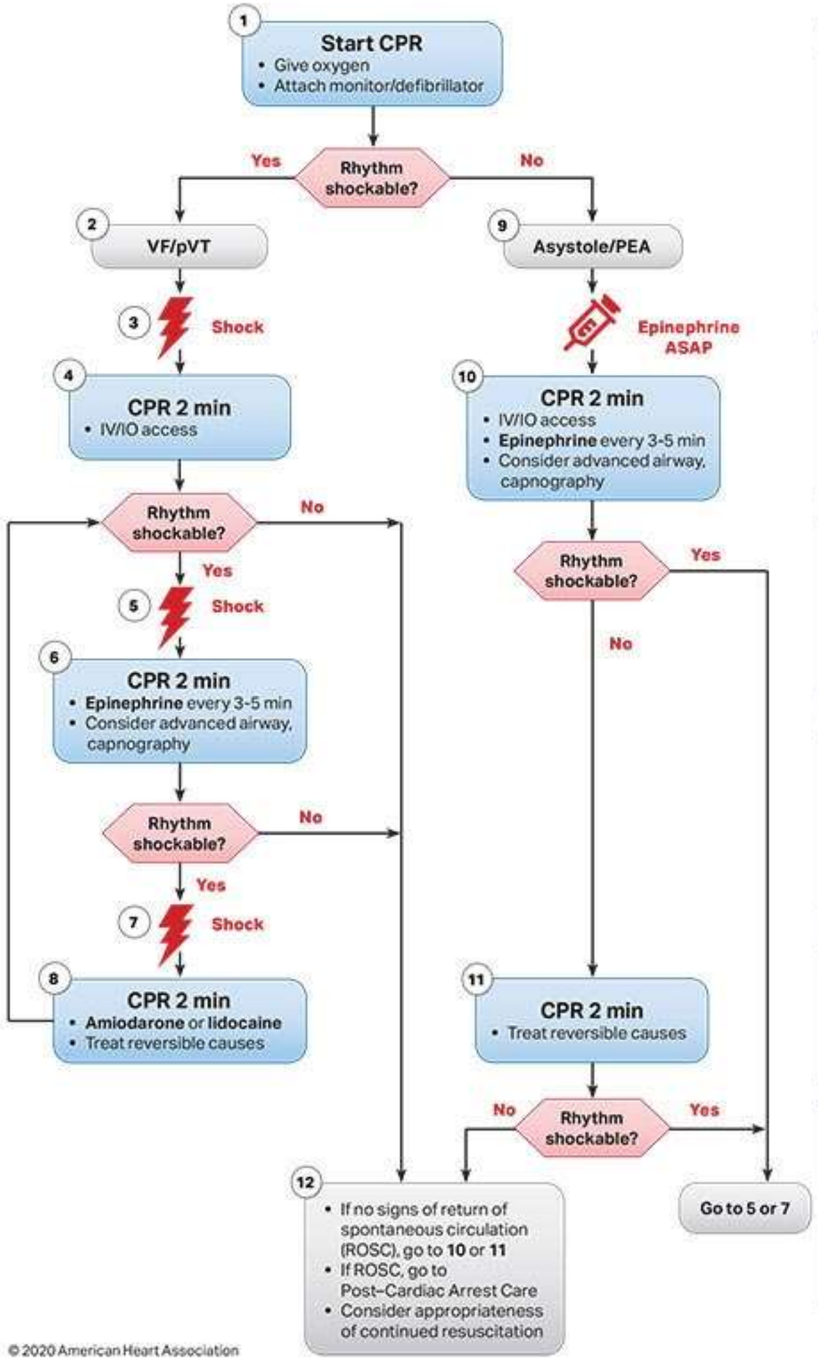


# Tim Resusitasi




Sumber: Aehlert, B. 2012. ACLS Study Guide (4th ed). St Louis, Missouri: Elsevier Inc

## Adult Cardiac Arrest Algorithm (VF/pVT/Asystole/PEA)




**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 $P_{ETCO_2}$ is low or decreasing, reassess CPR quality.

**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.

**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

**Return of Spontaneous Circulation (ROSC)**

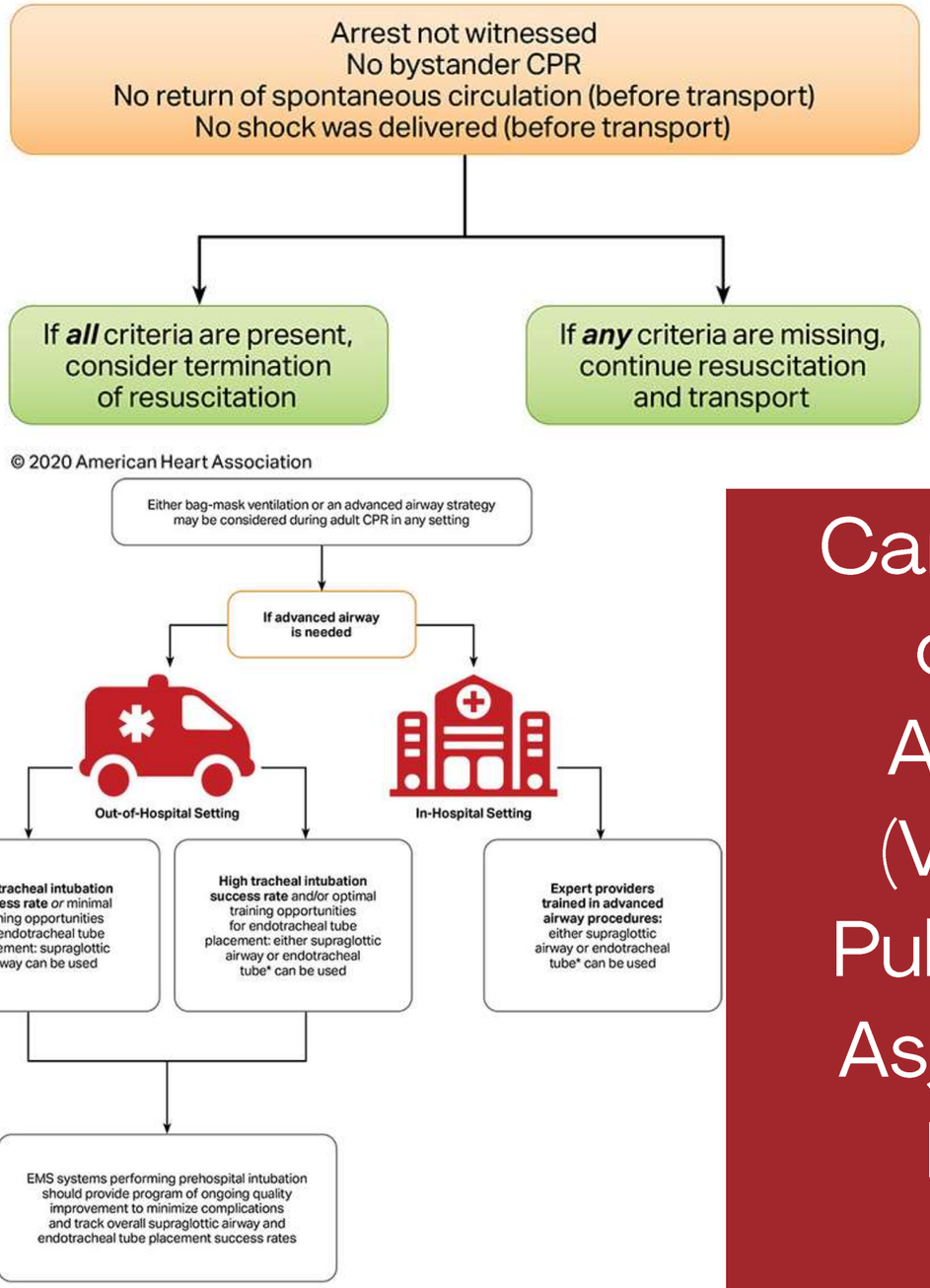
- Pulse and blood pressure
- Abrupt sustained increase in $P_{ETCO_2}$ (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

**Reversible Causes**

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

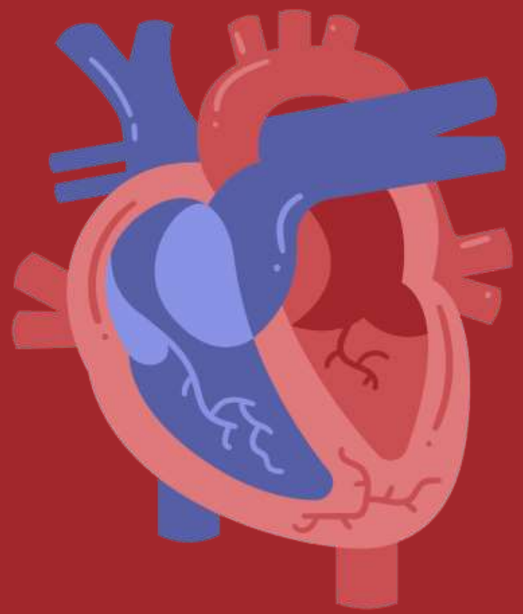


## ACLS Termination of Resuscitation




# Cardiovascular Arrest (VF/ VT Pulseless/ Asystole/ PEA)

# Bradikardia pada dewasa



## Adult Bradycardia Algorithm

Assess appropriateness for clinical condition.
Heart rate typically <50/min if bradyarrhythmia.

**Identify and treat underlying cause**

- Maintain patent airway; assist breathing as necessary
- Oxygen (if hypoxemic)
- Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
- IV access
- 12-Lead ECG if available; don't delay therapy
- Consider possible hypoxic and toxicologic causes

**Persistent bradyarrhythmia causing:**

- Hypotension?
- Acutely altered mental status?
- Signs of shock?
- Ischemic chest discomfort?
- Acute heart failure?

No → **Monitor and observe**

Yes

**Atropine**

If atropine ineffective:

- Transcutaneous pacing
  *and/or*
- **Dopamine** infusion
  *or*
- **Epinephrine** infusion

**Consider:**

- Expert consultation
- Transvenous pacing



**Doses/Details**

**Atropine IV dose:**
First dose: 1 mg bolus.
Repeat every 3-5 minutes.
Maximum: 3 mg.

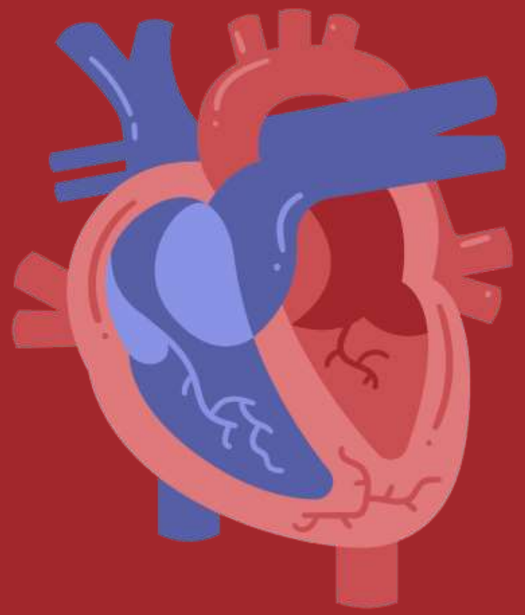
**Dopamine IV infusion:**
Usual infusion rate is 5-20 mcg/kg per minute.
Titrate to patient response; taper slowly.

**Epinephrine IV infusion:**
2-10 mcg per minute infusion.
Titrate to patient response.

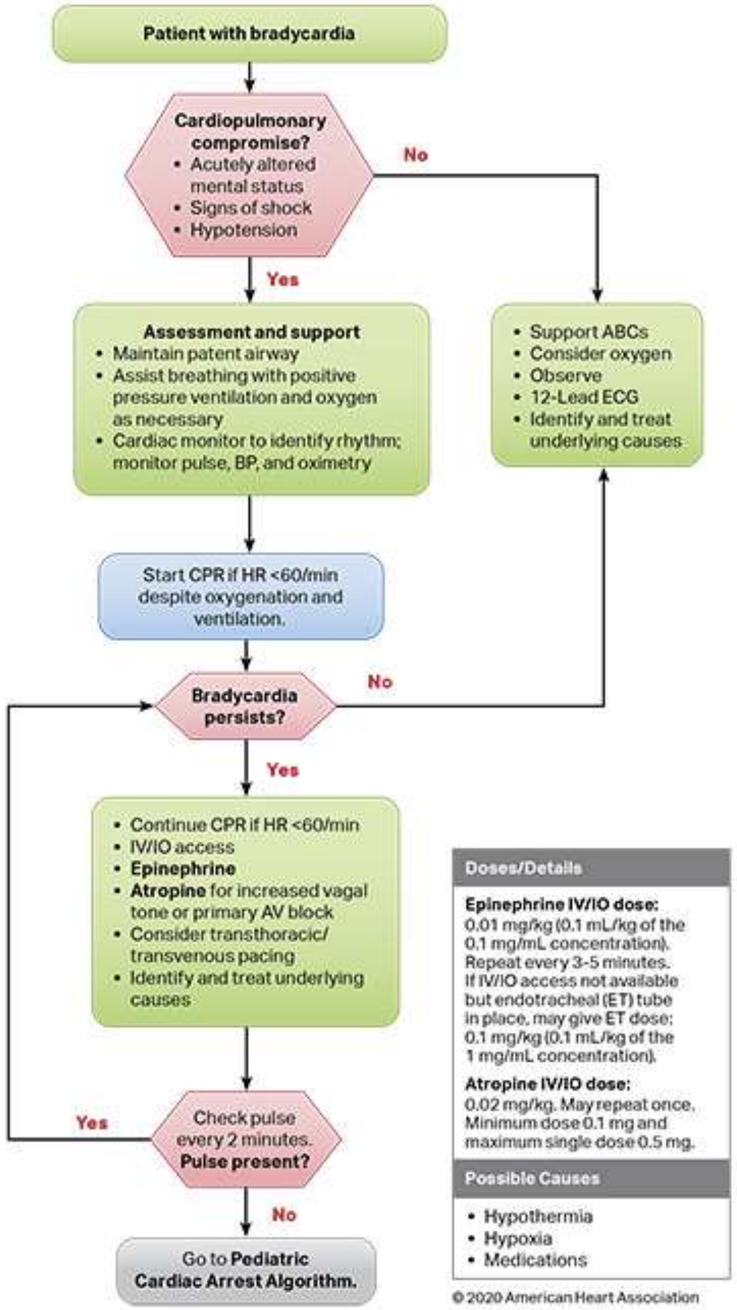
**Causes:**

- Myocardial ischemia/infarction
- Drugs/toxicologic (eg, calcium-channel blockers, beta blockers, digoxin)
- Hypoxia
- Electrolyte abnormality (eg, hyperkalemia)

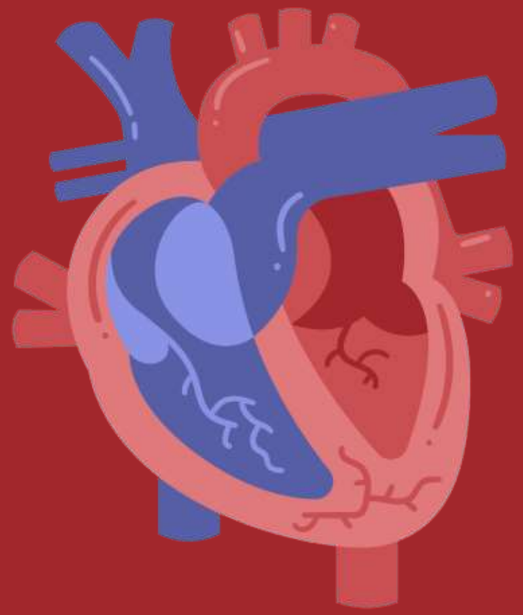
# BRADIKARDIA PADA ANAK



## Pediatric Bradycardia With a Pulse Algorithm



# Takikardia pada dewasa



## Adult Tachycardia With a Pulse Algorithm

Assess appropriateness for clinical condition.
Heart rate typically ≥150/min if tachyarrhythmia.

**Identify and treat underlying cause**
- Maintain patent airway; assist breathing as necessary
- Oxygen (if hypoxemic)
- Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
- IV access
- 12-lead ECG, if available

**Persistent tachyarrhythmia causing:**
- Hypotension?
- Acutely altered mental status?
- Signs of shock?
- Ischemic chest discomfort?
- Acute heart failure?

Yes → **Synchronized cardioversion**
- Consider sedation
- If regular narrow complex, consider adenosine

No

**Wide QRS? ≥0.12 second**

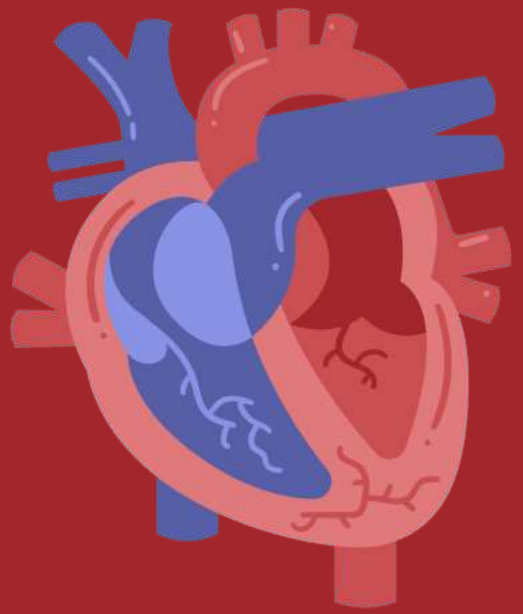
Yes → **Consider**
- Adenosine only if regular and monomorphic
- Antiarrhythmic infusion
- Expert consultation

No
- Vagal maneuvers (if regular)
- Adenosine (if regular)
- β-Blocker or calcium channel blocker
- Consider expert consultation

**If refractory, consider**
- Underlying cause
- Need to increase energy level for next cardioversion
- Addition of anti-arrhythmic drug
- Expert consultation

| Doses/Details |
|---|
| **Synchronized cardioversion:**<br>Refer to your specific device's recommended energy level to maximize first shock success.<br>**Adenosine IV dose:**<br>First dose: 6 mg rapid IV push; follow with NS flush.<br>Second dose: 12 mg if required. |
| ***Antiarrhythmic Infusions for Stable Wide-QRS Tachycardia***<br>**Procainamide IV dose:**<br>20-50 mg/min until arrhythmia suppressed, hypotension ensues, QRS duration increases >50%, or maximum dose 17 mg/kg given. Maintenance infusion: 1-4 mg/min. Avoid if prolonged QT or CHF.<br>**Amiodarone IV dose:**<br>First dose: 150 mg over 10 minutes. Repeat as needed if VT recurs. Follow by maintenance infusion of 1 mg/min for first 6 hours.<br>**Sotalol IV dose:**<br>100 mg (1.5 mg/kg) over 5 minutes. Avoid if prolonged QT. |

# TAKIKARDIA PADA ANAK



## Pediatric Tachycardia With a Pulse Algorithm

**Initial assessment and support**
- Maintain patent airway; assist breathing as necessary
- Administer oxygen
- Cardiac monitor to identify rhythm; monitor pulse, blood pressure, and oximetry
- IV/IO access
- 12-Lead ECG if available

**Evaluate rhythm with 12-lead ECG or monitor.**

**Probable sinus tachycardia *if***
- P waves present/normal
- Variable RR interval
- Infant rate usually <220/min
- Child rate usually <180/min

**Search for and treat cause.**

**Cardiopulmonary compromise?**
- Acutely altered mental status
- Signs of shock
- Hypotension

Yes / No

**Evaluate QRS duration.** (Yes branch)
- Narrow (≤0.09 sec)
- Wide (>0.09 sec)

**Probable supraventricular tachycardia**
- P waves absent/abnormal
- RR interval not variable
- Infant rate usually ≥220/min
- Child rate usually ≥180/min
- History of abrupt rate change

- If IV/IO access is present, give **adenosine**
  or
- If IV/IO access is not available, or if adenosine is ineffective, perform synchronized cardioversion

**Possible ventricular tachycardia**

**Synchronized cardioversion**
Expert consultation is advised before additional drug therapies.

**Evaluate QRS duration.** (No branch)
- Narrow (≤0.09 sec)
- Wide (>0.09 sec)

**Probable supraventricular tachycardia**
- P waves absent/abnormal
- RR interval not variable
- Infant rate usually ≥220/min
- Child rate usually ≥180/min
- History of abrupt rate change

**Consider vagal maneuvers.**

If IV/IO access is present, give **adenosine.**

**Possible ventricular tachycardia**

If rhythm is **regular** and QRS **monomorphic**, consider **adenosine.**

**Expert consultation is recommended.**

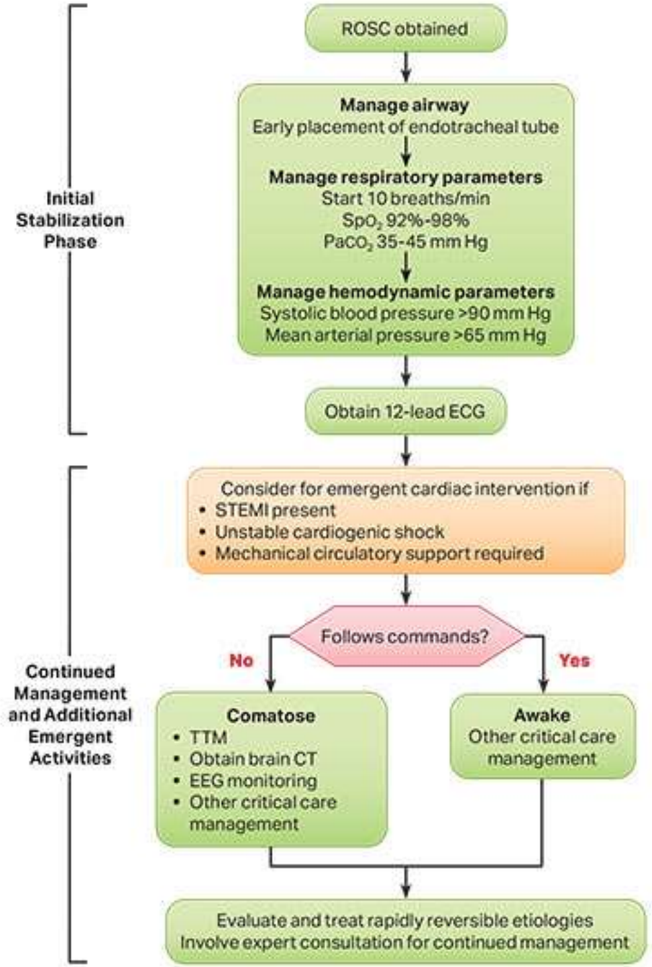
**Doses/Details**

**Synchronized cardioversion**
Begin with 0.5-1 J/kg; if not effective, increase to 2 J/kg. Sedate if needed, but don't delay cardioversion.

**Drug Therapy**

**Adenosine IV/IO dose**
- First dose: 0.1 mg/kg rapid bolus (maximum: 6 mg)
- Second dose: 0.2 mg/kg rapid bolus (maximum second dose: 12 mg)

## Adult Post–Cardiac Arrest Care Algorithm






### 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

### 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

**H**ypovolemia
**H**ypoxia
**H**ydrogen ion (acidosis)
**H**ypokalemia/**h**yperkalemia
**H**ypothermia
**T**ension pneumothorax
**T**amponade, cardiac
**T**oxins
**T**hrombosis, pulmonary
**T**hrombosis, coronary

| Components of Post–Cardiac Arrest Care | Check |
|---|---|
| **Oxygenation and ventilation** | |
| Measure oxygenation and target normoxemia 94%-99% (or child's normal/appropriate oxygen saturation). | ☐ |
| Measure and target $Paco_2$ appropriate to the patient's underlying condition and limit exposure to severe hypercapnia or hypocapnia. | ☐ |
| **Hemodynamic monitoring** | |
| Set specific hemodynamic goals during post–cardiac arrest care and review daily. | ☐ |
| Monitor with cardiac telemetry. | ☐ |
| Monitor arterial blood pressure. | ☐ |
| Monitor serum lactate, urine output, and central venous oxygen saturation to help guide therapies. | ☐ |
| Use parenteral fluid bolus with or without inotropes or vasopressors to maintain a systolic blood pressure greater than the fifth percentile for age and sex. | ☐ |
| **Targeted temperature management (TTM)** | |
| Measure and continuously monitor core temperature. | ☐ |
| Prevent and treat fever immediately after arrest and during rewarming. | ☐ |
| If patient is comatose apply TTM (32°C-34°C) followed by (36°C-37.5°C) or only TTM (36°C-37.5°C). | ☐ |
| Prevent shivering. | ☐ |
| Monitor blood pressure and treat hypotension during rewarming. | ☐ |
| **Neuromonitoring** | |
| If patient has encephalopathy and resources are available, monitor with continuous electroencephalogram. | ☐ |
| Treat seizures. | ☐ |
| Consider early brain imaging to diagnose treatable causes of cardiac arrest. | ☐ |
| **Electrolytes and glucose** | |
| Measure blood glucose and avoid hypoglycemia. | ☐ |
| Maintain electrolytes within normal ranges to avoid possible life-threatening arrhythmias. | ☐ |
| **Sedation** | |
| Treat with sedatives and anxiolytics. | ☐ |
| **Prognosis** | |
| Always consider multiple modalities (clinical and other) over any single predictive factor. | ☐ |
| Remember that assessments may be modified by TTM or induced hypothermia. | ☐ |
| Consider electroencephalogram in conjunction with other factors within the first 7 days after cardiac arrest. | ☐ |
| Consider neuroimaging such as magnetic resonance imaging during the first 7 days. | ☐ |

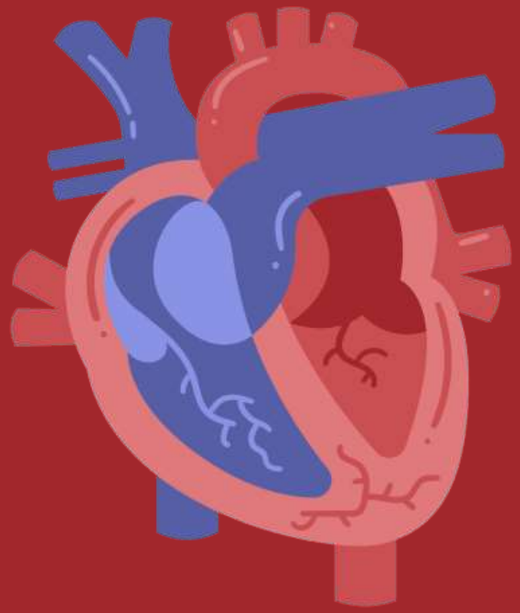
# Immediate Post-Cardiovascular Arrest

# EVALUASI

1. Apa itu Algoritme ACLS?
2. Apa pendekatan tatalaksana sindrom koroner akut menurut algoritme ACLS ?
3. Apa pendekatan tatalaksana Stroke menurut algoritme ACLS ?
4. Apa pendekatan tatalaksana keracunan opioid menurut algoritme ACLS ?
5. Mengenali bradikardia dan takikardia yang dapat bermuara dalam kondisi henti jantung atau menurunkan prognosis resusitasi

# KESIMPULAN

1. MengetahuiAlgoritme ACLS
2. Mengetahuipendekatan tatalaksana sindrom koroner akut menurut algoritme ACLS
3. Mengetahui pendekatan tatalaksana Stroke menurut algoritme ACLS
4. Mengetahui pendekatan tatalaksana keracunan opioid menurut algoritme ACLS
5. Mengenali bradikardia dan takikardia yang dapat bermuara dalam kondisi henti jantung atau menurunkan prognosis resusitasi



# Referensi :
# 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care


Terima
Kasih