# PEDIATRIC BASIC AND ADVANCED LIFE SUPPORT: PBLS & PALS احیا پایه و پیشرفته در کودکان

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Pediatric intensivist

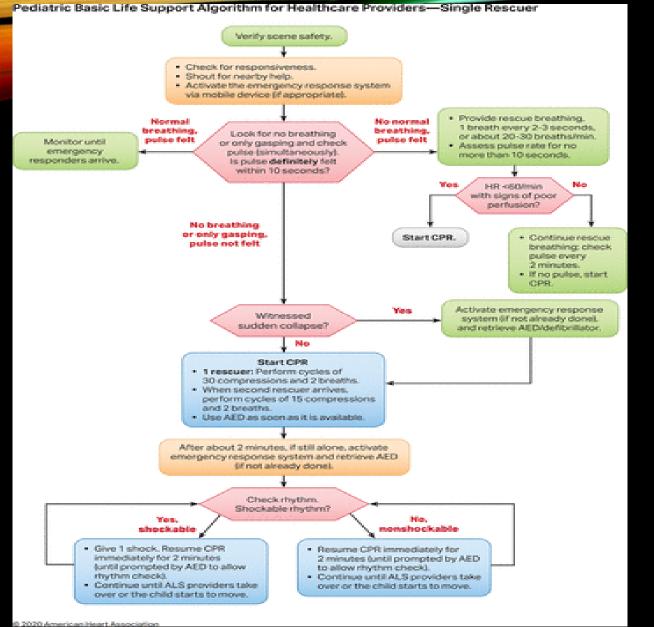
Figure 10. AHA Chains of Survival for pediatric IHCA and OHCA.

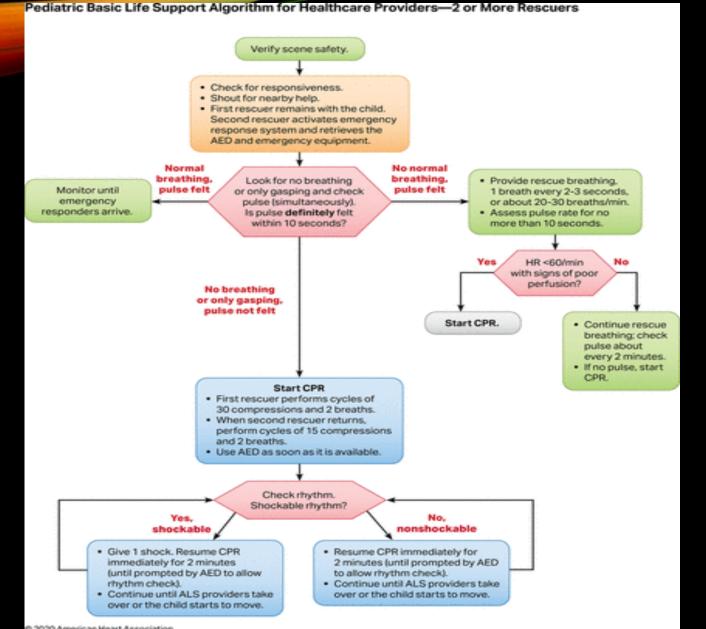
#### IHCA



#### **OHCA**













### Compressions

Push hard and fast on the center of the victim's chest



### Airway

Tilt the victim's head back and lift the chin to open the airway



#### Breathing

Give mouth-to-mouth rescue breaths

American Heart Association

Learn and Line

COSTO Reservant Heart Aventuelos 1/5/1906/8840

توالى احيا

\*حفظ سلامتی احیاگروقربانی در صحنه حادثه،

\*بررسی پاسخ بیمار: هشیاری: توخوب هستی؟

\*کمک خواستن

\*در احیا دونفره: نفردوم اورژانس را خبر کرده و دفیبریلاتور را فعال میکند

\*بررسی نفس کشیدن

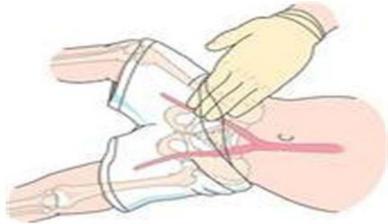
\*حداکثرطی 10ثانیه: بررسی نبض

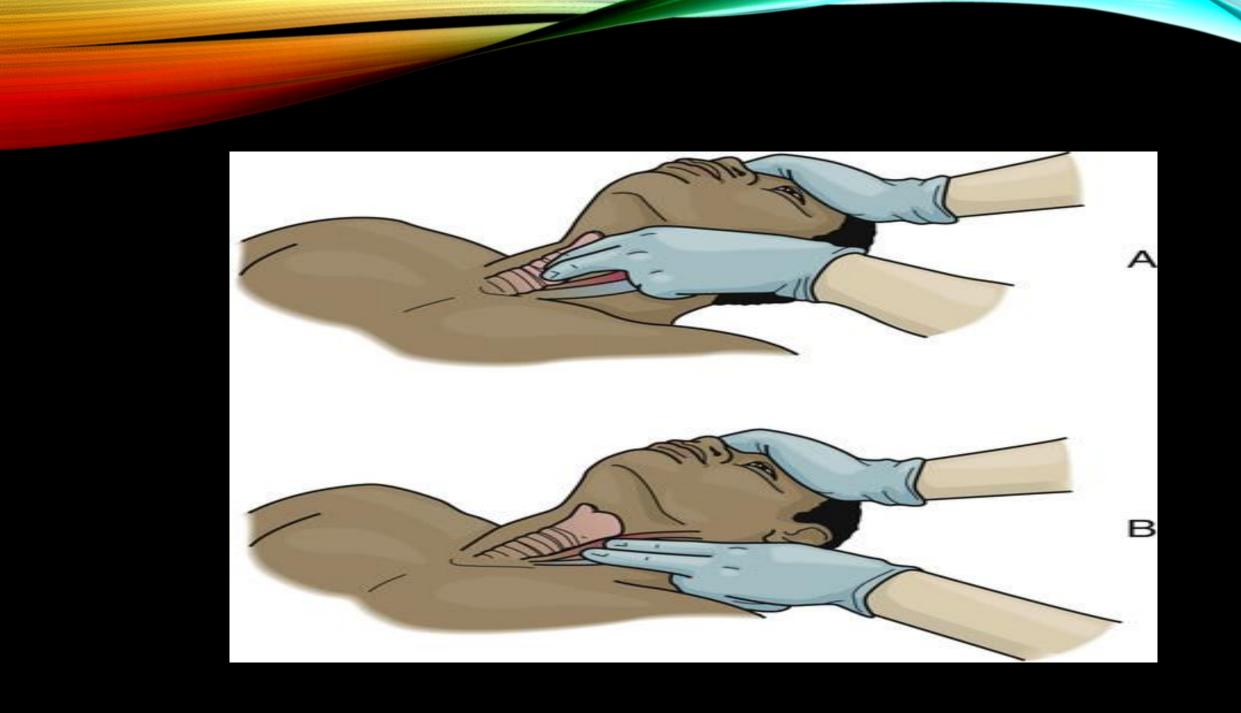
\*شیرخوار:نبض براکیال

\*كودك ونوجوان:نبض كاروتيد يا فمورال

### Infant/Child Basic Life Support Brachial site Femoral site







1-قربانی تنفس ونبض دارد 2-قربانی تنفس نرمال ندارد،نبض دارد 3-قربانی تنفس نرمال ندارد،نبض دارد 3-قربانی تنفس نرمال ندارد و نبض نیز ندارد: \*احیای تک نفره

\*احیای دونفره

## Normal Breathing –Present Pulse:

فرد تنفس طبیعی دارد ونبض لمس میشود

Single Rescuer: Activate ERS-Return To Patient-Monitor Until ER Arrives

\*احیا تک نفره: خبر کردن اور ژانس ،بازگشت نزد بیمار وپایش تا زمان رسیدن اور ژانس

Two or more Rescuers: Monitor Until ER Arrives

\*احیا دونفره: پایش تا زمان رسیدن اورژانس

# فرد تنفس غیرطبیعی داردنبض لمس Abnormal Breathing Present Pulse می شود

□1-!Give Rescue Breath

یک تنفس هردوتاسه ثانیه می دهیم 30-20 تنفس دردقیقه

اگر نبض کمترومساوی 60عدداست وعلایم اختلال خونرسانی به ارگانها دیده میشود: ماسار قلبی

□2- if PR<60 With Poor Perfusion:

Do Chest Compression:

هردودقیقه بررسی نبض،اگر نبض ندارد:احیا

□3-check pulse Q 2 min:If No Pulse:CPR

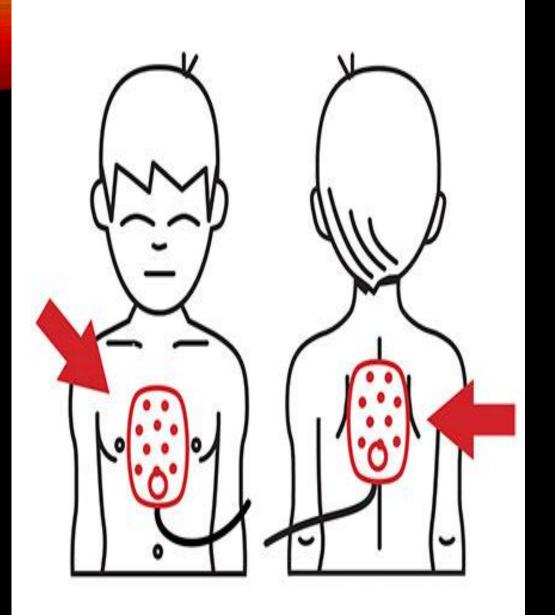
## AED: AUTOMATED EXTERNAL DEFIBRILLATOR

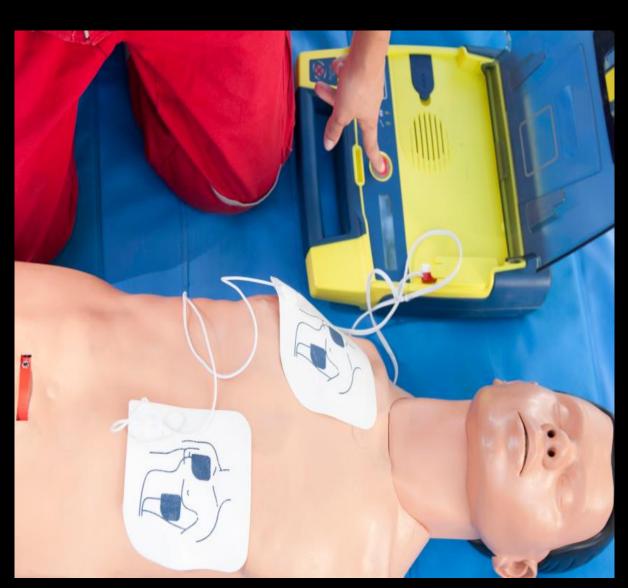
**Victims>8 Years** 

- ☐ Use AED As Soon As It Is Available
- □Only Use Adult Pads
- ☐Place The Pads As Illustrated
  On The Pads

#### Victims <8Years

- ☐ Use AED As Soon As It Is Available
- □Use Pediatric Pads
- □Place The Pads As Illustrated On The Pads
- □If You Don't Have Pediaric Pads:Use Adult Pads : Not Covering Each Other
- □If AED Has A Key or Switch That Will Deliver A Child Dose, Turn The Key Or Switch





# AED: AUTOMATED EXTERNAL DEFIBRILLATOR





# تنفس ندارد ونبض نمس نمس ندارد ونبض نمس ندارد ونبض نمس ندارد ونبض نمس نمیشود

احیای تک نفره:

□ احیاگرخودش شاهد این اتفاق(کلایس) بوده: خبر کردن اورژانس و آوردن دفیبریلاتور

> □احیاگرخودش شاهد این کلاپس نبوده:

احیای دو نفره انجام احیا برای دو دقیقه

احیای قلبی ریوی:PR

الماسارُ قلبی) Breaths(ماسارُ قلبی) (اماسارُ قلبی) (اماسارُ علبی)

\*Single Rescuer: 30/2

\*Two Or More : 15/2

Changing Their Place Q 2 min

- □Breaths:Advanced Airway Is In Place(Intubated): Q 2-3 sec
- □After 5Cycles Of CPR(2 min): AED

# CHEST COMPRESSIONS: ماسار قلبی

- **Place:** Lower Half Of The Sternum
- Push Fast: 100-120 Beats/min: All Ages
- Push Hard: 1/3 Chest AP Diameter: Allow Complete Chest Recoil After Each Compression
- Minimize Interruptions :Only For: Ventilation, Rhythm Check, Shock Delivery
- □Once Advanced Airway(Intubation,..) Fixed: Continuous Chest Compressions

☐Single Rescuer:

\*Infant

**2Finger Technique** 

\*Child

1-2 Hands

□Two Or More: \*Child

\*Child \*Infant

**Thumb Encircling** 

# AFTER 2 MIN CPR(5 CYCLES): USE AED

Shockable Rhythm

Non-Shockable Rhythm

- □Give 1 Shock
- □Immediately Resume CPR for 2 mins
- □ Continue By Retriving AED After 2min CPR
- □ Continue Until ALS Providers Take Over OR The Victim Starts To Move

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- □Continue By Retriving AED After 2min CPR
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  Over OR The Victim Starts To Move

## تنفس:BREATHS

\*\*برای مفید واقع شدن تنفس: راه هوایی ابتدا باید باز باشد که راههای زیر مطرح است:

## **Dopening The Airway Methods:**

1-Head Tilt-Chin Lift (HT-CL)

**2-Jaw Thrust**: Suspicious Neck Trauma: If This Maneuver Didn't Help In Neck Trauma: use HT-CL

□Neutral –Sniffing Head Position:

External Auditory Canal At The Level Or Anterior To Infants Shoulder

# تهویه:VENTILATION

□With A Mouth to Barrier Device(eg Pocket Mask) :Single Rescuer

□With Bag And Mask Ventilation: Two Rescuers

- \*Proper Mask Size
- \*\*Sniffing(Neutral) Position-Head Tilt Chin Lift
- \*\*\*E-C Clamp Technique
- \*\*\*\*Give Each Breath Over 1 sec
- \*\*\*\*\*One Person-Two person

Figure 62-2 Opening the airway with the head-tilt/chin-lift maneuver. One hand is used to tilt the head, extending the neck. The index finger of the rescuer's other hand lifts the mandible outward by lifting the chin. Head-tilt should not be performed if a cervical spine injury is suspected.

# Bag Mask Ventilation: Opening Airway

Head Tilt and Chin Lift



- One hand applies downward pressure to forehead and index and middle finger of the second hand lift at chin.
- Lifts tongue from posterior pharynx

Jaw Thrust



- For unstable cervical spine
- Place heels of hands on parieto-occipital area
- Grasp angles of mandible with fingers, and displace jaw anteriorly.



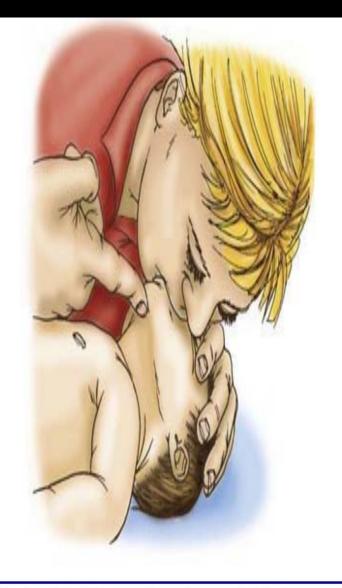


Figure 62-4 Rescue breathing in a child. The rescuer's mouth covers the child's mouth, creating a mouth-to-mouth seal.

One hand maintains the head-tilt; the thumb and forefinger of the same hand are used to pinch the child's nose.

Figure 62-3 Rescue breathing in an infant. The rescuer's mouth covers the infant's nose and mouth, creating a seal. One hand performs the head-tilt while the other hand lifts the infant's jaw. Avoid head-tilt if the infant has sustained head or neck

troum



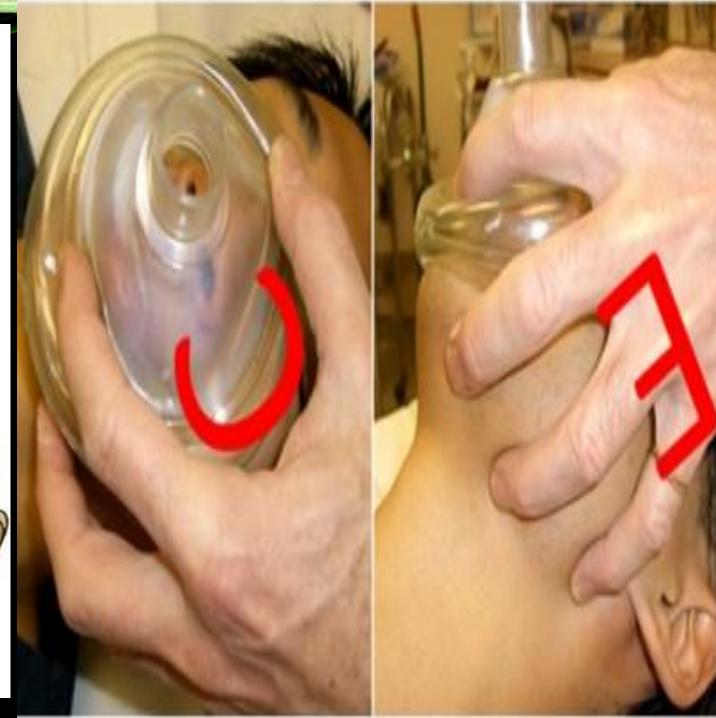
Correct Covers mouth, nose, and chin but not eyes



Incorrect Too large: covers eyes and extends over chin



Incorrect
Too small: does not cover nose and mouth well



# **BAG-MASK VENTILATION:1&2 PERSON**

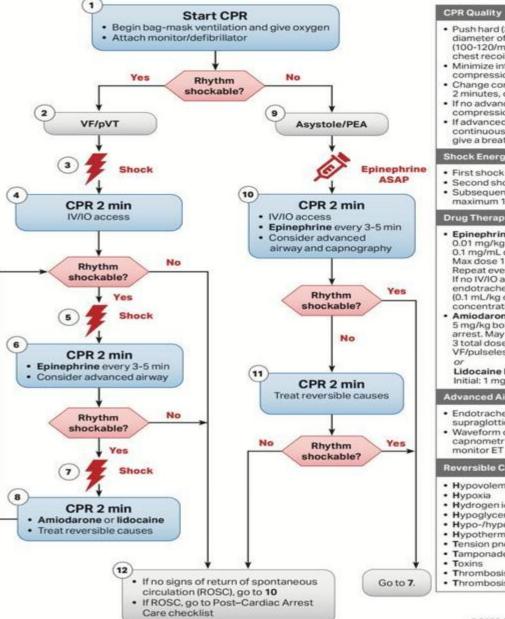








Figure 11. Pediatric Cardiac Arrest Algorithm.



- Push hard (≥½ 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
- 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**

- Hypovolemia
- Hydrogenion (acidosis)
- Hypoglycemia
- · Hypo-/hyperkalemia
- · Hypothermia
- Tension pneumothorax
- · Tamponade, cardiac
- · Thrombosis, pulmonary
- · Thrombosis, coronary

#### Patient with bradycardia Cardiopulmonary compromise? No · Acutely altered mental status Signs of shock Hypotension Assessment and support Support ABCs Maintain patent airway Consider oxygen Assist breathing with positive Observe 12-Lead ECG pressure ventilation and oxygen as necessary Identify and treat · Cardiac monitor to identify rhythm; underlying causes monitor pulse, BP, and oximetry Start CPR if HR <60/min despite oxygenation and ventilation. No Bradycardia persists? Continue CPR if HR <60/min</li> IV/IO access Doses/Details Epinephrine Atropine for increased vagal Epinephrine IV/IO dose: tone or primary AV block 0.01 mg/kg (0.1 mL/kg of the Consider transthoracic/ 0.1 mg/mL concentration). transvenous pacing Repeat every 3-5 minutes. Identify and treat underlying If IV/IO access not available causes but endotracheal (ET) tube in place, may give ET dose: 0.1 mg/kg (0.1 mL/kg of the 1 mg/mL concentration). Atropine IV/IO dose: 0.02 mg/kg. May repeat once. Check pulse Yes Minimum dose 0.1 mg and every 2 minutes. maximum single dose 0.5 mg. Pulse present? **Possible Causes** Hypothermia Hypoxia Go to Pediatric Medications Cardiac Arrest Algorithm. © 2020 American Heart Association

#### Doses/Details Initial assessment and support Maintain patent airway; assist breathing as necessary Synchronized Administer oxygen cardioversion · Cardiac monitor to identify rhythm; monitor pulse, Begin with 0.5-1 J/kg; blood pressure, and oximetry if not effective, increase IV/IO access to 2 J/kg. Sedate if • 12-Lead ECG if available needed, but don't delay cardioversion. **Drug Therapy** Probable sinus tachycardia if Adenosine IV/IO dose Evaluate rhythm P waves present/normal First dose: 0.1 mg/kg with 12-lead ECG rapid bolus (maximum: · Variable RR interval or monitor. 6 mg) • Infant rate usually <220/min Second dose: • Child rate usually <180/min 0.2 mg/kg rapid bolus (maximum second dose: 12 mg) Cardiopulmonary Search for compromise? and treat cause. Yes No · Acutely altered mental status • Signs of shock Hypotension **Narrow** Wide Wide Narrow (≤0.09 sec) (>0.09 sec) (≤0.09 sec) (>0.09 sec) **Evaluate Evaluate** QRS duration. QRS duration. Possible ventricular Probable supraventricular Possible ventricular Probable supraventricular tachycardia tachycardia tachycardia tachycardia • P waves absent/abnormal P waves absent/abnormal RR interval not variable RR interval not variable • Infant rate usually ≥220/min Infant rate usually ≥220/min Child rate usually ≥180/min Child rate usually ≥180/min · History of abrupt rate change History of abrupt rate change If rhythm is **regular** and Synchronized cardioversion QRS monomorphic, consider adenosine. **Expert consultation** is advised before additional drug • If IV/IO access is present, Consider therapies. vagal maneuvers. give adenosine Expert consultation • If IV/IO access is not is recommended. available, or if adenosine is ineffective, perform synchronized cardioversion If IV/IO access is present, give adenosine. © 2020 American Heart Association

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 ${\sf Paco}_2$ 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.	

# After learning \*Basic Life support\* from Online classes :

