



## Basic Life Support (Adult – Child) Foreign Body Airway Obstruction



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## Objectives

- ☞ Understand the importance of Basic Life Support
- ☞ How to assess the collapsed victim
- ☞ How to perform chest compression and rescue breathing
- ☞ How to perform safe defibrillation using an automated defibrillator
- ☞ How to manage the choking victim



## Resuscitation

- ☞ A word used since 1890...
- ☞ Making something active or vigorous again
- ☞ Reviving someone from unconsciousness or apparent death
- ☞ Many aspects
  - ☞ Cardiac arrest



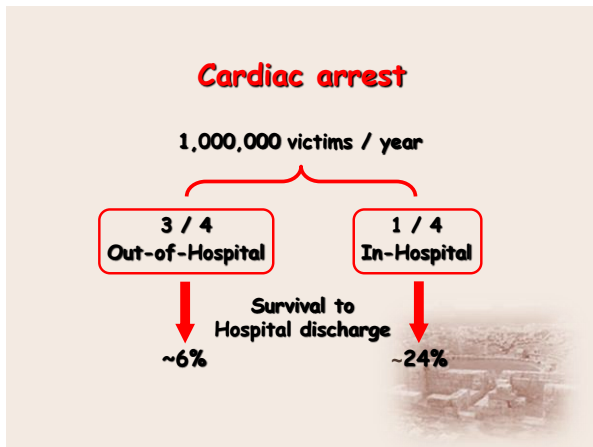
## Hippocrates



«But I would more especially commend the physician who, in acute diseases, by which the bulk of mankind are cut off, conducts the treatment better than others»

«Θα συνιστούσα ένθερμα τον ιατρό, ο οποίος στις οξείες παθήσεις, από τις οποίες υποφέρει το μεγαλύτερο μέρος της ανθρωπότητας, χειρίζεται τη θεραπεία καλύτερα από όλους»





### Evidence based Ignorance !

[www.drsvenkatesan.co.in](http://www.drsvenkatesan.co.in)

- ☞ We do not know anything
- ☞ The reason we do not know anything is because we have predetermined ideas about what is appropriate, what can be done, and what cannot be done
- ☞ The majority of critically ill patients in USA are withdrawn from life support within 2 days after admission to the ICU! We do not let them live or at least "fight for it"

**Any Doctor here?**

**I'm a doctor! Whats going on?**

**A heart attack!!!**

**Well I mean I'm a second year medical student so almost a doctor haha :)**

**He is going to die!!!**

The deep layer of the flexor compartment of the forearm comprises three muscles: flexor digitorum profundus, pronator quadratus, and flexor pollicis longus. Flexor digitorum profundus arises from the ulna and its adjacent interosseous membrane, and splits to insert on the distal phalanges of the medial four digits. Pronator quadratus arises from the lower quarter of the radius.

## RESEARCH ARTICLE

## Open Access

## Do senior medical students meet recommended emergency medicine curricula requirements?

Sami Shaban<sup>1</sup>, Arif Alper Cevik<sup>2\*</sup>, Mustafa Emin Canakci<sup>3</sup>, Caglar Kuas<sup>3</sup>, Margret El Zubeir<sup>1</sup> and Fikri Abu-Zidan<sup>4</sup>**Abstract**

**Background:** Emergency departments (EDs) offer a variety of learning opportunities for undergraduate medical students. It is however, difficult to evaluate whether they are receiving recommended training during their emergency medicine (EM) clerkship without identifying their clinical activities. We aimed to evaluate the clinical exposure of the final year medical students at our College during their EM clerkship.

**Methods:** This is a retrospective analysis of prospectively collected student logbooks. 75 students rotated in a 4-week EM clerkship during 2015–2016. The students rotated in EDs of two hospitals. Each ED treats more than 120,000 cases annually. The students completed 12 eight-hours shifts. Presentations and procedures seen were compared with EM curriculum recommendations.

**Results:** Five thousand one hundred twenty-two patient presentations and 3246 procedures were recorded in the logbooks, an average (SD) of 68.3 (17.6) patients and 46.1 (14.0) procedures. None of the students encountered all ten recommended presentations. Two students (2.6%) logged all nine procedure categories of the EM curriculum.

**Conclusion:** Recommended presentations and procedures of the EM clerkship were not fully encountered by all our students. Different settings vary in the availability and type of patients and procedures. Each clinical clerkship should tailor their teaching methods based on the available learning opportunities.

**Keywords:** Emergency medicine; Clerkship; Logbook; Encounter; Curriculum



## Cardiac arrest - definition

Loss of mechanical function of the heart

### ☞ Primary

- ☞ A problem with the heart's electrical system (arrhythmia)

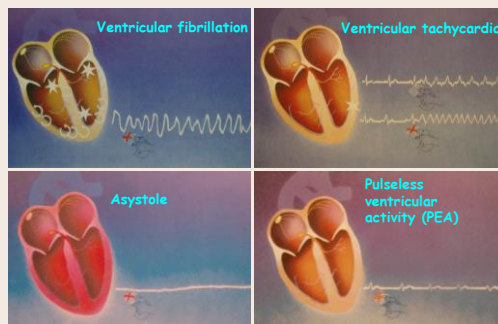
### ☞ Secondary

- ☞ The problem originates outside of the heart
  - ☞ Asphyxia, hemorrhage, drowning, overdose/poisoning, sepsis, etc.

### ☞ Rhythms

- ☞ Shockable: Ventricular fibrillation, Pulseless ventricular tachycardia
- ☞ Non-shockable: Pulseless electrical activity, Asystole

## Cardiac arrest rhythms



## Epidemiology

- ☞ ~ 700,000/year in Europe, ~ 1,000,000/year worldwide
- ☞ USA: 3<sup>rd</sup> cause of death / Greece: ? (Primary Health Care ~ 15,3/100.000 πληθυσμού ανά έτος → ~1530 victims/year)
- ☞ Responsible for half of all heart disease deaths
- ☞ The first manifestation of ischemic heart disease in ~50% of the patients
- ☞ 25-50% (76%) of patients suffer a ventricular fibrillation cardiac arrest

## Pre-arrest period

- ☞ A major pathophysiological disorder
- ☞ There is at least one cause
- ☞ Sudden onset
- ☞ Expected event - progressive deterioration

## Cardiopulmonary Resuscitation (CPR)

The **CORRECT** sequence of actions required to restore spontaneous circulation



## Cardiac arrest



- ☞ Loss of **mechanical** function of the heart
- ☞ Whole-body ischemia
- ☞ "Golden hour" // Some seconds to a few minutes
- ☞ What happens to the **heart without CPR** ? ? ?

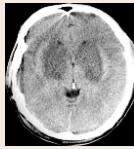
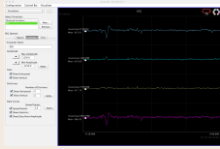




## Cardiac arrest



- ☞ What happens to the **brain without CPR** ? ? ?
- ☞ No cerebral blood flow
- ☞ Cessation of brain electrical activity within ~10 sec
- ☞ Irreversible cell death within 4 min



## Awareness - alert during the arrest / CPR

- Awake
- Speaks
- Deliberate moves
- Communicates
- Warning him of the impending defibrillation
- Remembers the CPR efforts



Is he alive ?

Leave him...  
This is futile...

He is awake! Let's  
anesthetize him !!!

How is this  
possible ?..?..?

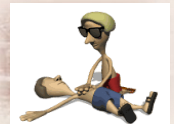
## What must we do? CPR !!!

- ☞ Why? To maintain circulatory flow !
  - ☞ Systolic arterial pressure (SAP) → Brain
  - ☞ Diastolic arterial pressure (DAP) → Heart



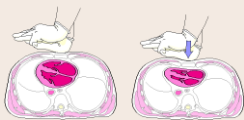
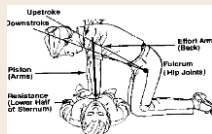
## Cardiopulmonary Resuscitation

- ☞ Chest compressions
  - ☞ Maximum SAP: 60-80 mmHg
  - ☞ Cardiac output: 25-40 % of the pre-arrest value
    - ☞ Brain: 30 % (SAP)
    - ☞ Coronary arteries: 5-15 % (DAP)
    - ☞ Other organs: < 5%
  - ☞ Must be **effective** !!!



## Cardiopulmonary Resuscitation

- ☞ Duration: 2 min
- ☞ Rate: 100-120/min
- ☞ Depth: 5-6 cm
- ☞ Full chest recoil
- ☞ Compression:ventilation ratio 30:2
- ☞ Change rescuer every 2 min



**Chest compression**

- Compression of the heart
- Increases intrathoracic pressure
- Cardiac output increases
- Good chest compressions increase forward blood flow and arterial pressure

**Chest decompression**

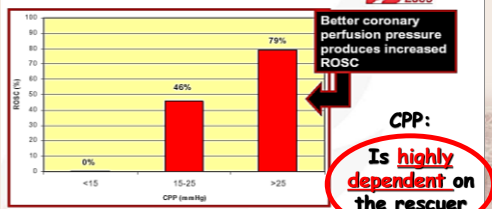
- Decreases intrathoracic pressure (may be <0)
- Good (full) decompression increases venous return
- Refills the heart/lungs with blood and increases cardiac output

...Brain-Heart-Brain-Heart-Brain-Heart...

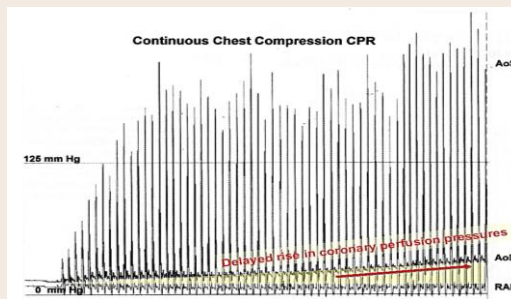
## Coronary perfusion pressure (CPP)

CPP = Diastolic arterial pressure - Right atrial pressure

### ROSC Correlated with CPP

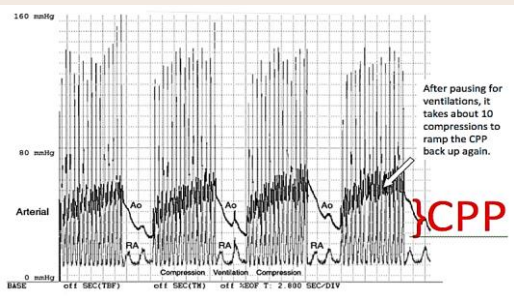


## CPP rises slowly...





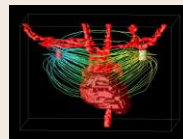
...but decreases sharply...



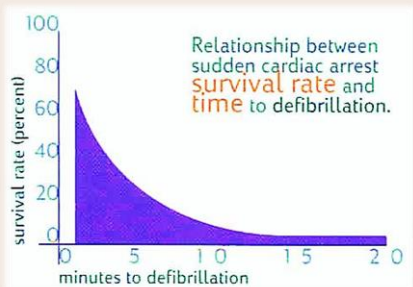
## Defibrillation (VF/pVT)



The use of an electric current to stop any irregular and dangerous activity in the heart's muscles

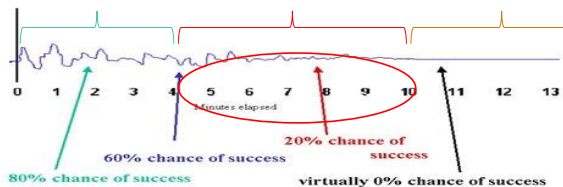


## Defibrillation



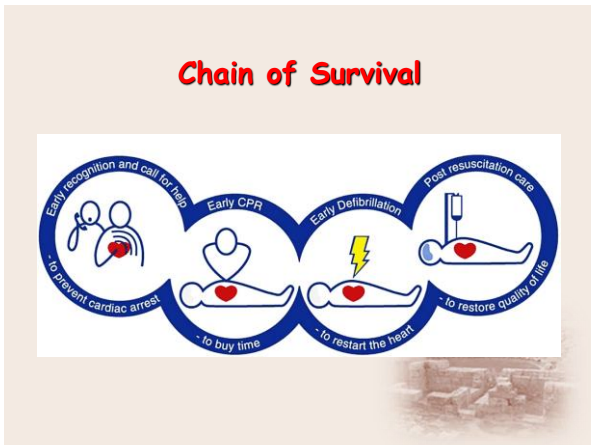
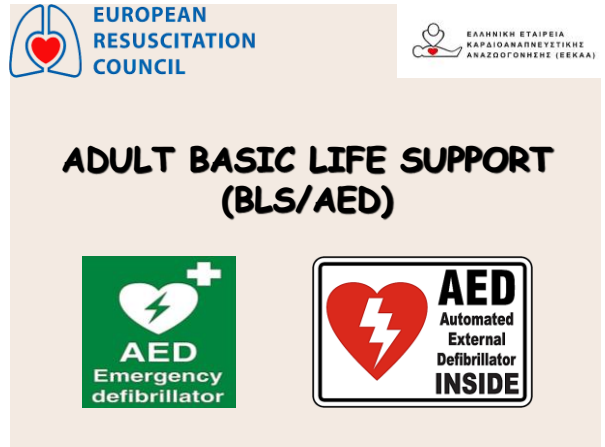
### Defibrillation Statistics:

Defibrillation's chances of restoring a pulse decrease rapidly with time



➤ High-quality chest compressions may extend the duration of ventricular fibrillation up to ~16 min







## Basic Life Support

- ☞ Sequences of procedures performed to restore the circulation of oxygenated blood after a sudden respiratory and/or cardiac arrest
- ☞ Chest compressions and pulmonary ventilation performed by anyone who knows how to do it, anywhere, immediately, without any other equipment



## BLS algorithm



Approach safely

Check response

Shout for help

Open airway

Check breathing

Call 112 / 166 (GR)

30 chest compressions

2 rescue breaths

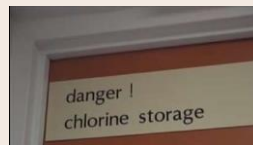


## Approach safely!

	Approach safely
Scene	Check response
	Shout for help
Rescuer	Open airway
	Check breathing
Victim	Call 112 / 166 (GR)
	30 chest compressions
Bystanders	2 rescue breaths

## Do NOT move the victim...

- ☞ Until qualified help arrives  
or
- ☞ Unless the scene dictates otherwise



### Check response



- Approach safely
- Check response**
- Shout for help
- Open airway
- Check breathing
- Call 112 / 166 (GR)
- 30 chest compressions
- 2 rescue breaths

### Check response



- Shake shoulders gently
- Ask "Are you all right?"
- If he responds:
  - Leave as you find him
  - Find out what is wrong
  - Reassess regularly
- If he does not respond:

### Shout for help



- Approach safely
- Check response
- Shout for help**
- Open airway
- Check breathing
- Call 112 / 166 (GR)
- 30 chest compressions
- 2 rescue breaths

### Open airway



- Approach safely
- Check response
- Shout for help
- Open airway**
- Check breathing
- Call 112 / 166 (GR)
- 30 chest compressions
- 2 rescue breaths

### Open airway



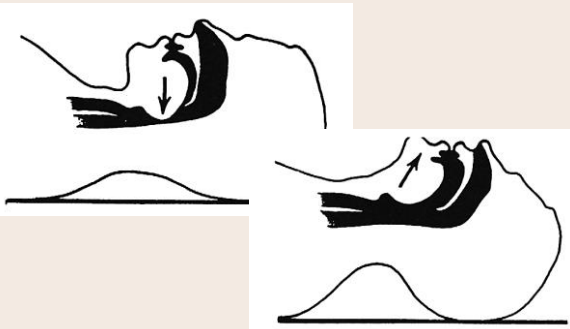
- Head tilt and chin lift
  - Lay rescuers
  - Non-healthcare rescuers
- No need for finger sweep unless solid material can be seen in the airway



### Open airway



### Open airway



### Open airway



**Jaw thrust** (Healthcare professionals)



## Check breathing



- Approach safely
- Check response
- Shout for help
- Open airway
- Check breathing**
- Call 112 / 166 (GR)
- 30 chest compressions
- 2 rescue breaths

## Check breathing



## Check breathing



- Look, listen and feel for **NORMAL** breathing
- If the patient is breathing normally → Recovery position



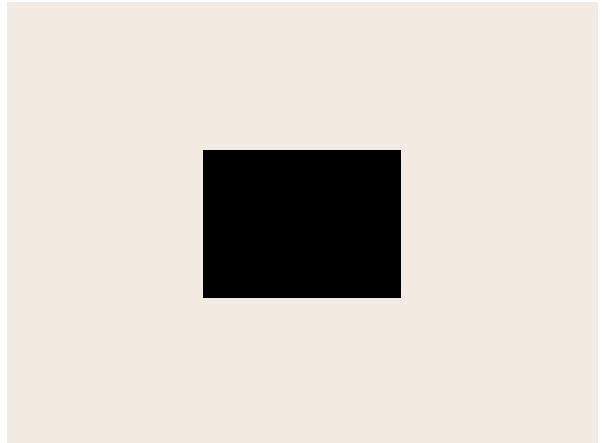
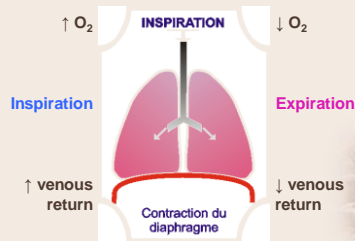
## Check breathing



- Look, listen and feel for **NORMAL** breathing
- If the patient is breathing normally → Recovery position
- **DO NOT** confuse **AGONAL** breathing with **NORMAL** breathing



## What is agonal breathing (gaspings)



## Agonal breathing

- ☞ Occurs shortly after the heart stops in up to 40% of cardiac arrests
- ☞ Described as barely, heavy, noisy, or gasping breathing
- ☞ Recognize as a sign of cardiac arrest
- ☞ Erroneous information can result in withholding CPR from cardiac arrest victim

## Call Emergency Medical Services (EMS)



- ☞ 112: European emergency phone number
- ☞ Available everywhere in the EU
- ☞ Free of charge

Approach safely

Check response

Shout for help

Open airway

Check breathing

**Call 112 / 166 (GR)**

30 chest compressions

2 rescue breaths

## 30 chest compressions

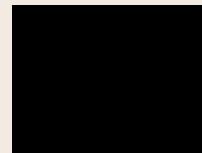
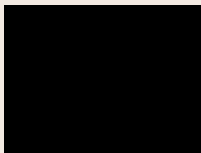


- Approach safely
- Check response
- Shout for help
- Open airway
- Check breathing
- Call 112 / 166 (GR)
- 30 chest compressions**
- 2 rescue breaths

## Chest compressions



- Place the heel of one hand in the centre of the chest
- Place other hand on top
- Interlock fingers
- Compress the chest
  - Rate 100/min
  - Depth 5-6 cm
  - Equal compression : relaxation
- Change CPR operator every 2 min





## Rescue breaths



- Pinch the nose
- Take a normal breath
- Place lips over mouth
- Blow until the chest rises (~ 500-600 ml)
- Take about 1 second
- Allow chest to fall
- Repeat (total 2 breaths)

## The use of protective devices is recommended



## The use of protective devices is recommended

Conventional  
mouth to mouth



Pocket mask



Face shield



## Continue CPR



30



2

### ☛ Chest compression-only CPR

- Continuously at a rate of 100-120/min

## Continuous chest compressions-only CPR



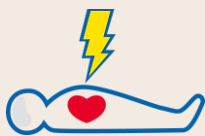
## BLS algorithm



- |                       |
|-----------------------|
| Approach safely       |
| Check response        |
| Shout for help        |
| Open airway           |
| Check breathing       |
| Call 112 / 166 (GR)   |
| 30 chest compressions |
| 2 rescue breaths      |



## Defibrillation



## BLS/AED algorithm

- |                      |
|----------------------|
| Approach safely      |
| Check response       |
| Shout for help       |
| Open airway          |
| Check breathing      |
| Call 112 / 166 (GR)  |
| Attach AED           |
| Follow voice prompts |

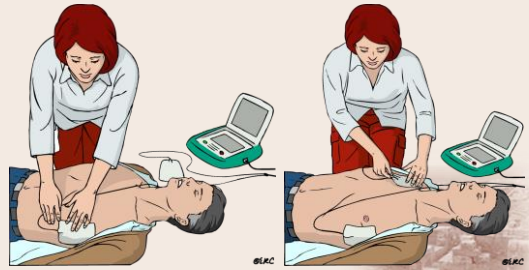
## Automated external defibrillator (AED)



- Some AEDs will automatically switch themselves on when the lid is opened



## Attach pads to casualty's bare chest



## Analyzing rhythm - do NOT touch victim

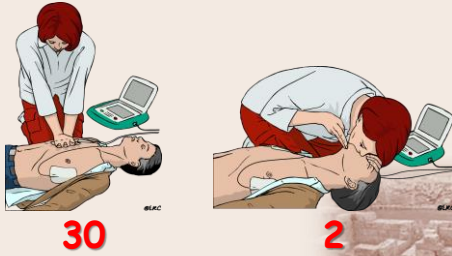


## Shock indicated

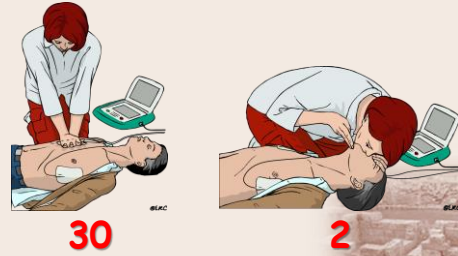


- Stand clear
- Deliver shock

**Shock delivered  
Follow AED instructions**



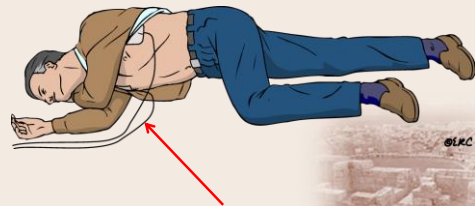
**No shock advised  
Follow AED instructions**

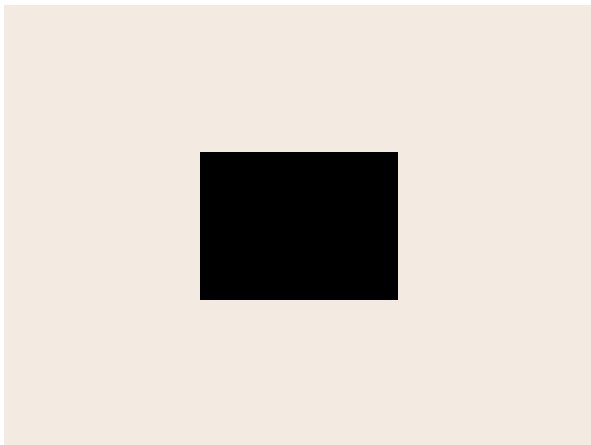




**Continue resuscitation until**

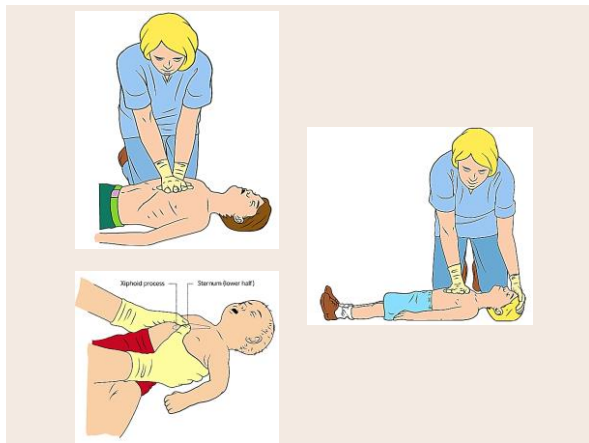
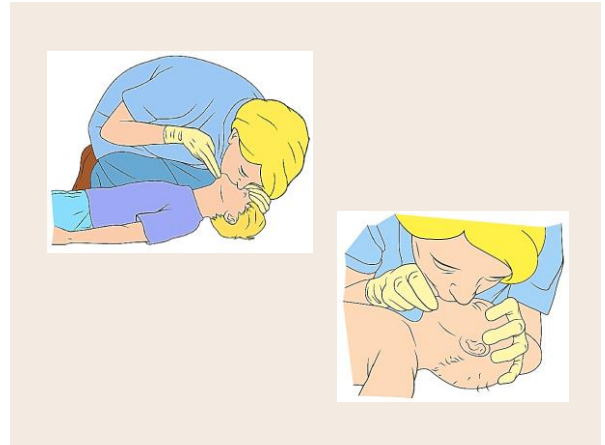
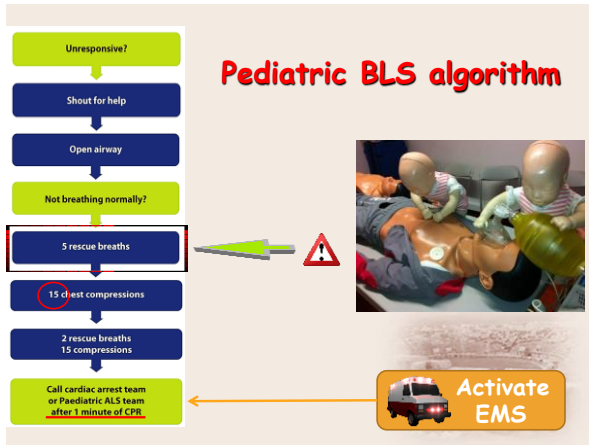
- Qualified help arrives and takes over
- Rescuer becomes exhausted
- The victim starts breathing normally

**If victim starts to breathe normally  
place in recovery position**





	
Approach safely	Approach safely
Check response	Check response
Shout for help	Shout for help
Open airway	Open airway
Check breathing	Check breathing
Call 112 / 166 (GR)	Call 112 / 166 (GR)
30 chest compressions	Attach AED
2 rescue breaths	Follow voice prompts



### Foreign-body airway obstruction (FBAO)

- ☞ Uncommon but potentially treatable cause of accidental death
- ☞ Most choking events are associated with eating
  - ☞ They are commonly witnessed
- ☞ The victims initially are conscious and responsive
  - ☞ Opportunities for early interventions which can be lifesaving
- ☞ Expected event - progressive deterioration



## Foreign-body airway obstruction (FBAO)

**ASK:** "Are you choking?"

SIGNS	MILD obstruction	SEVERE obstruction
"Are you choking?"	"YES"	Unable to speak, may nod
Other signs	Can speak, cough, breathe	Can not breathe/wheezy breathing/silent attempts to cough/unconsciousness

## Adult FBAO treatment

**SUSPECT  
CHOKING**

**Be alert to choking particularly if victim is eating**



## Adult FBAO treatment

**ENCOURAGE TO  
COUGH**

**Instruct victim to  
cough**



## Adult FBAO treatment

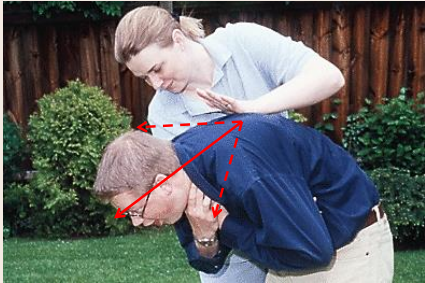
**GIVE BACK  
BLOWS**

**If cough becomes  
ineffective give up  
to 5 back blows**



**If the victim shows signs of severe airway obstruction and is conscious apply five back blows**

**Stand to the side and slightly behind the victim Support the chest with one hand and lean the victim well forwards so that when the obstructing object is dislodged it comes out of the mouth rather than goes further down the airway Give five sharp blows between the shoulder blades with the heel of your other hand**



## Adult FBAO treatment

### GIVE ABDOMINAL THRUSTS

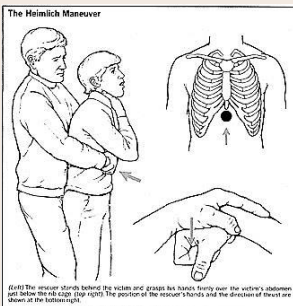
If back blows are ineffective give up to 5 abdominal thrusts



If five back blows fail to relieve the airway obstruction, give up to five abdominal thrusts as follows:

- Stand behind the victim and put both arms round the upper part of the abdomen
- Lean the victim forwards
- Clench your fist and place it between the umbilicus (navel) and the ribcage
- Grasp this hand with your other hand and pull sharply inwards and upwards
- Repeat up to five times
- If the obstruction is still not relieved, continue alternating five back blows with five abdominal thrusts

## Adult FBAO treatment



## Adult FBAO treatment

START CPR

Start CPR if the victim becomes unresponsive



If the victim at any time becomes unresponsive:

- support the victim carefully to the ground
- immediately activate the ambulance service
- begin CPR with chest compressions

## Pediatric FBAO algorithm

Effective cough

Ineffective cough

Encourage cough

Continue to check for deterioration to ineffective cough or until obstruction relieved

Unconscious

Open airway  
5 breaths  
Start CPR

Conscious

5 back blows  
5 thrusts  
(chest only for infants)  
(alternative abdominal and chest for child >1 year)



**Ι. ΥΠΟΧΡΕΩΤΙΚΗ ΕΚΠΑΙΔΕΥΣΗ**  
 (α) Είναι υποχρεωτική η εκπαίδευση για όλους τους επαγγελματίες Υγείας (ιατροί, νοσηλεύτες, πληρώματα ασθενοφόρων, παραϊατρικό προσωπικό), δια μέσου του θεσμού της εκπαιδευτικής δόξιας στη:  
 -Βασική Υποστήριξη Ζωής (Β), και την  
 -Αυτόματη Εξωτερική Απινδωση (ΑΕΑ) (συνημμένο 1) το πρόγραμμα Συνο και ένα θεωρητικό σεμινάριο ανανήτων στη Βασική Υποστήριξη της ζωής και την Αυτόματη Εξωτερική Απινδωση.  
 (β) Είναι υποχρεωτική η εκπαίδευση για όλους τους ιατρούς στην:  
 -Επιπέδου υποστήριξη της ζωής στους ενήλικες (Πρόγραμμα ΕΠΕΙΣΖ)-συνημμένο 2  
 -Παιδιατρική Αναζωογόνηση (για τους ιατρούς που εμπλέκονται στην καθημερινή ιατρική πράξη με παιδιά).

[www.cprguidelines.eu](http://www.cprguidelines.eu)

[www.eekaa.com](http://www.eekaa.com)



"You are not studying to pass the exam...  
You are studying for the day when you are the  
only thing between the patient and the grave"

**Optimal CPR is not easy...**

**...but its difference from**

**"any" CPR DEFINITELY is many lives...**

**Do you have any questions ???**



### **MCQ 1**

☞ **What is the optimal compression depth during adult BLS?**

1. 2-3 cm
2. 8-9 cm
3. 3-5 cm
4. 5-6 cm
5. 4-5 cm



### **MCQ 1**

☞ **What is the optimal compression depth during adult BLS?**

1. 2-3 cm
2. 8-9 cm
3. 3-5 cm
4. **5-6 cm**
5. 4-5 cm



**MCQ 2**

☞ The correct BLS steps for adults are:

1. Assess the individual and start 30:2 CPR
2. Start 30:2 CPR, attach the AED, and give two more breaths
3. Give 5 breaths and assess the individual
4. Assess the individual, call EMS and get the AED, follow voice prompts
5. Immediately place the patient in recovery position

**MCQ 2**

☞ The correct BLS steps for adults are:

1. Assess the individual and start 30:2 CPR
2. Start 30:2 CPR, attach the AED, and give two more breaths
3. Give 5 breaths and assess the individual
4. **Assess the individual, call EMS and get the AED, follow voice prompts**
5. Immediately place the patient in recovery position

**MCQ 3**

☞ After delivering a shock with an AED, what is the next step in caring for a person?

1. Reassess for a pulse
2. Do chest compressions only
3. Resume CPR
4. Do ventilation only
5. Establish IV access

**MCQ 3**

☞ After delivering a shock with an AED, what is the next step in caring for a person?

1. Reassess for a pulse
2. Do chest compressions only
3. **Resume CPR**
4. Do ventilation only
5. Establish IV access



**MCQ 4**

☞ A 21-year-old college student turns blue and collapses while eating a hot dog at a bar. You are concerned that this student may have choked. What is the best method to clear an obstruction from the airway?

1. Begin CPR with chest compressions
2. Abdominal thrust (Heimlich maneuver)
3. Back blow
4. Blind finger sweep
5. None of the above

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**MCQ 5**

☞ The proper steps for operating an AED are:

1. Power on the AED, attach electrode pads, shock the person, and analyze the rhythm
2. Power on the AED, attach electrode pads, analyze the rhythm, and shock the person
3. Power on the AED, analyze the rhythm, attach electrode pads, and shock the person
4. Power on the AED, shock the person, attach electrode pads, and analyze the rhythm
5. None of the above

**MCQ 5**

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2. **Power on the AED, attach electrode pads, analyze the rhythm, and shock the person**
3. Power on the AED, analyze the rhythm, attach electrode pads, and shock the person
4. Power on the AED, shock the person, attach electrode pads, and analyze the rhythm
5. None of the above





