CPR

Cardio Pulmonary Resuscitation

CPR

- = sequence of immediate actions to sustain flow of oxygenated blood
- unconsciousness and not breathing normally > start CPR !
- vital functions
  - breathing
  - circulation
  - consciousness

Chain of life

History

- Peter Safar (1923 - 2003)
  - experiments on volunteers, arteficial breathing
- Kouwenohoven et al
  - chest compressions in dogs > palpation pulse on carotid arteries
- 1960
  - Safar introduced first basic rules for CPR

- BLS Basic Life Support
  - no equipment available
  - everybody
  - bystander x trained bystander
  - AED
- ALS Advanced Life Support
  - medical professionals
  - with equipments (drugs, monitoring, tracheal tube,...)

When to start CPR ?

- patient unconscious and not breathing normally
  - do NOT palpate pulse
- GASPING IS NOT A NORMAL BREATHING

CPR termination

- ROSC (Return Of Spontaneous Circulation)
- handover to medical team
- exhaustion of rescuers

Do not start CPR

- danger for you and your colleagues
- sings od death
- catastrophic trauma (decapitation)
- death penalty

AED

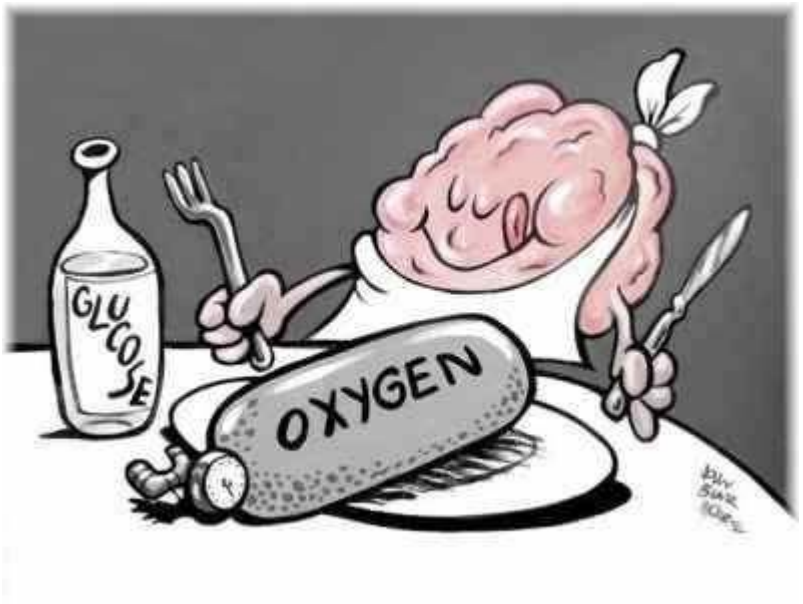
- Automated External Defibrillator

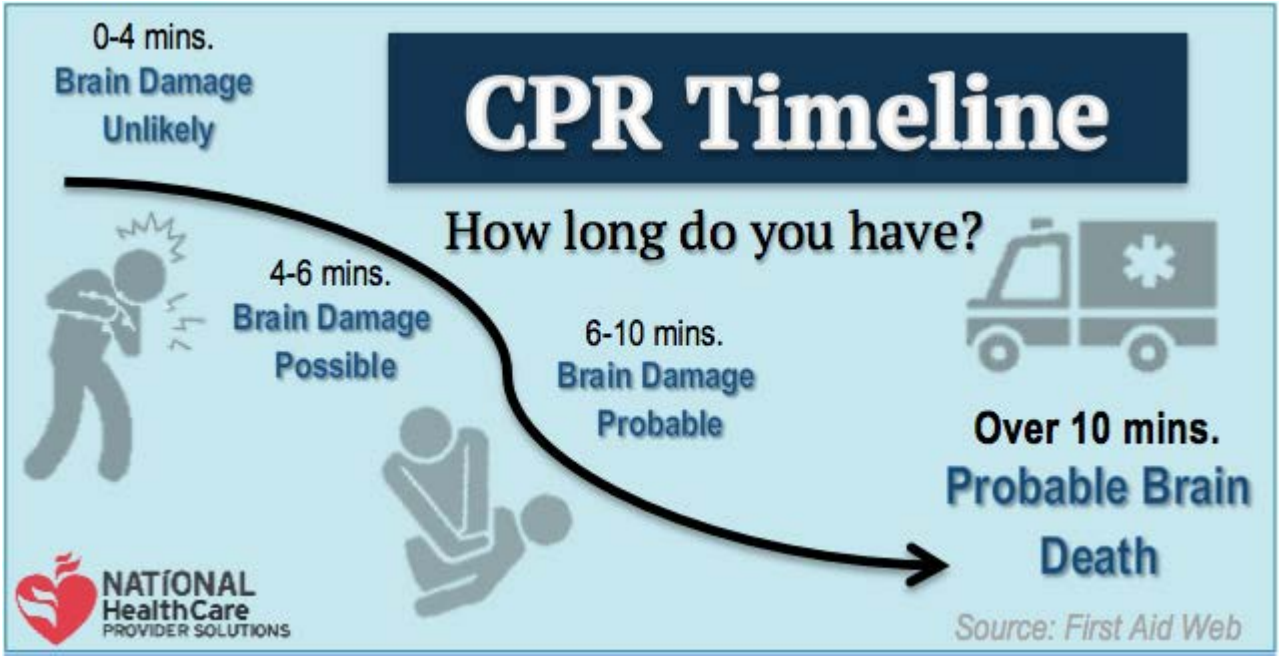
AED

- Automated External Defibrillator
- mostly cardiac arrest
- early availability AED, time to first shock
- if apropriate > deliver shock

Patophysiology SCA

- SCA = Sudden Cardiac Arrest
- after 15 seconds SCA unconsciousness
- till 1 min gasping
- 4 – 5 min – brain cells are death


GLUCOSE
OXYGEN


0-4 mins.
Brain Damage
Unlikely
CPR Timeline
How long do you have?
4-6 mins.
Brain Damage
Possible
6-10 mins.
Brain Damage
Probable
Over 10 mins.
Probable Brain
Death
NATIONAL
HealthCare
PROVIDER SOLUTIONS
Source: First Aid Web

Causes SCA

- cardiac
- non cardiac

- SHOCKABLE
- NON-SHOCKABLE

Cardiac causes

- majority cases in adults
- children < 15 %
- CAD (Coronary Artery Disease - atherosclerosis)
- 80-90% Vfib / pVT
- some oxygen remains in body
- call first

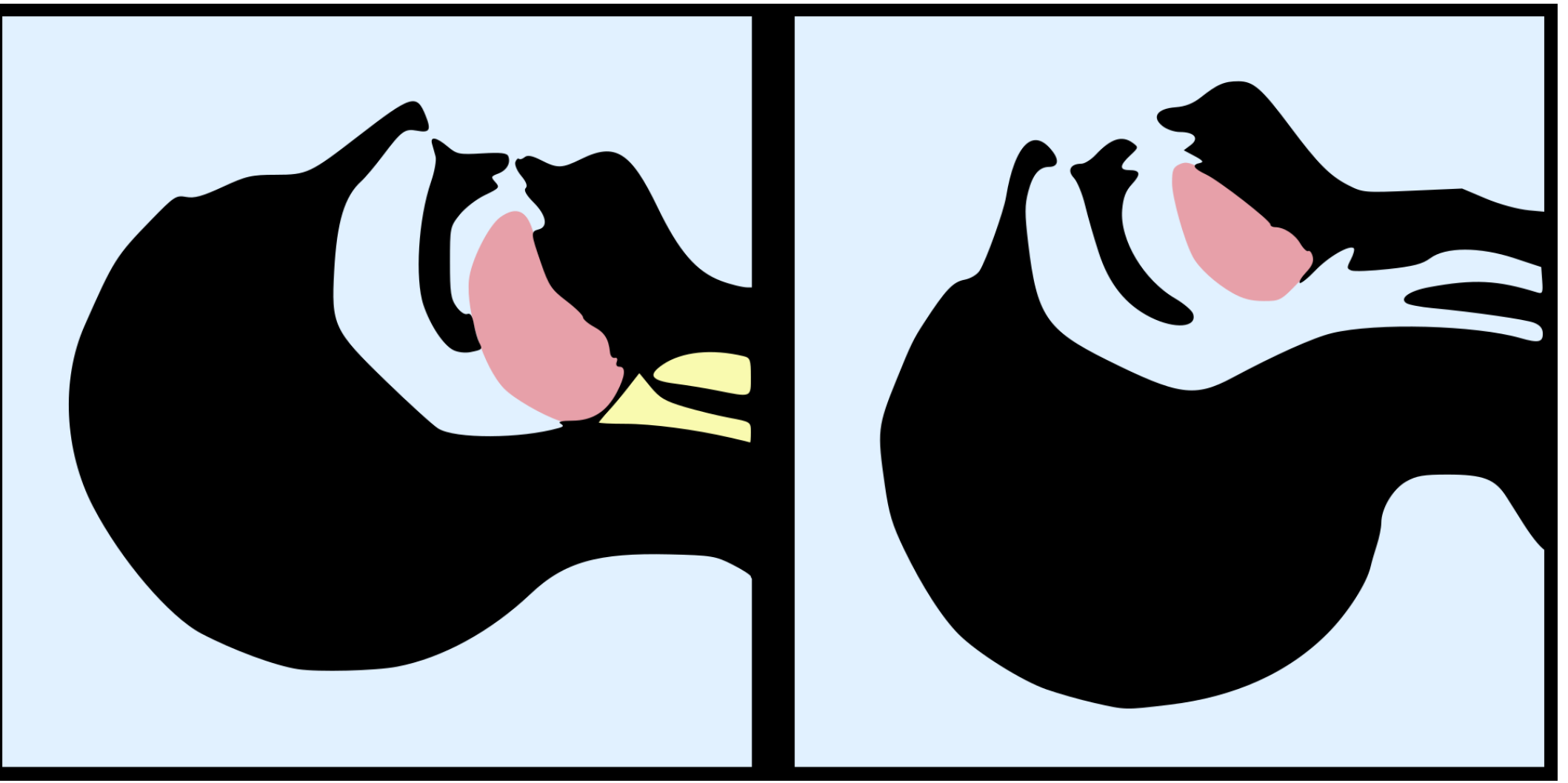
Non cardiac causes SCA

- majority in childhood – 85 – 93 %
- adults < 20 %
- choking, drowning, bleeding,
- all oxygen consumpted
- call fast

ABC approach

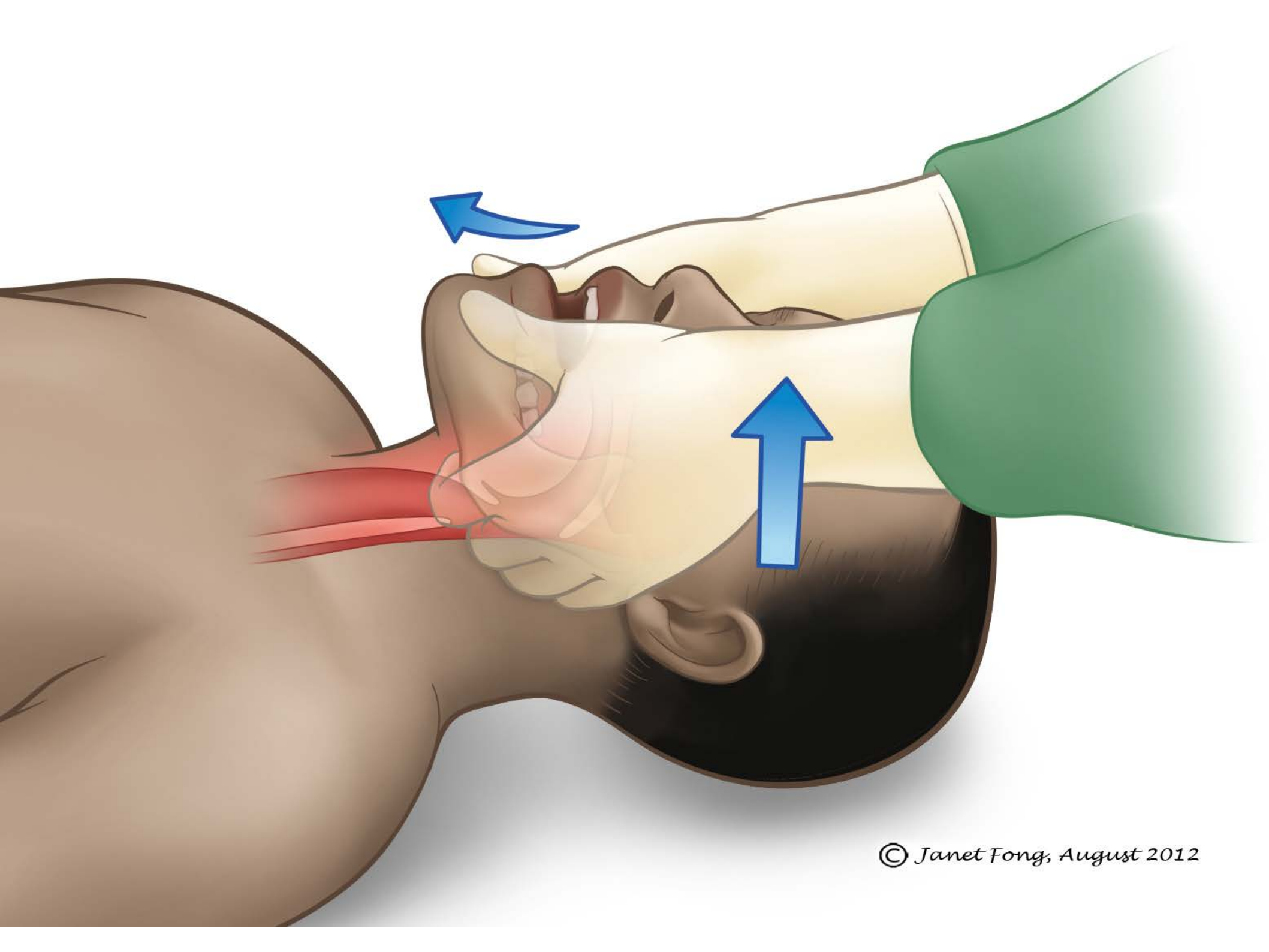
- A – Airway
- B – Breathing
- C – Circulation + AED

Airways - DC



Airways - DC

- head tilt, chin lift
- jaw thrust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CPR children

- majority – asphyxia
  - choking, drowning, inflammation,...
- call fast
- reversion of hypoxia
- age borders not clear
- newborn x child x older child

CPR children

- start with 5 breaths (airways opened)
- basic rule 15 : 2
- AED – children pads
- 1 min cpr before calling EMS
- newborn 3:1

EUROPEAN RESUSCITATION COUNCIL

Paediatric Basic Life Support

www.erc.edu | info@erc.edu
Published October 2010 by European Resuscitation Council vzw, Emile Vandervelde laan 99, 2910 Essen, Belgium
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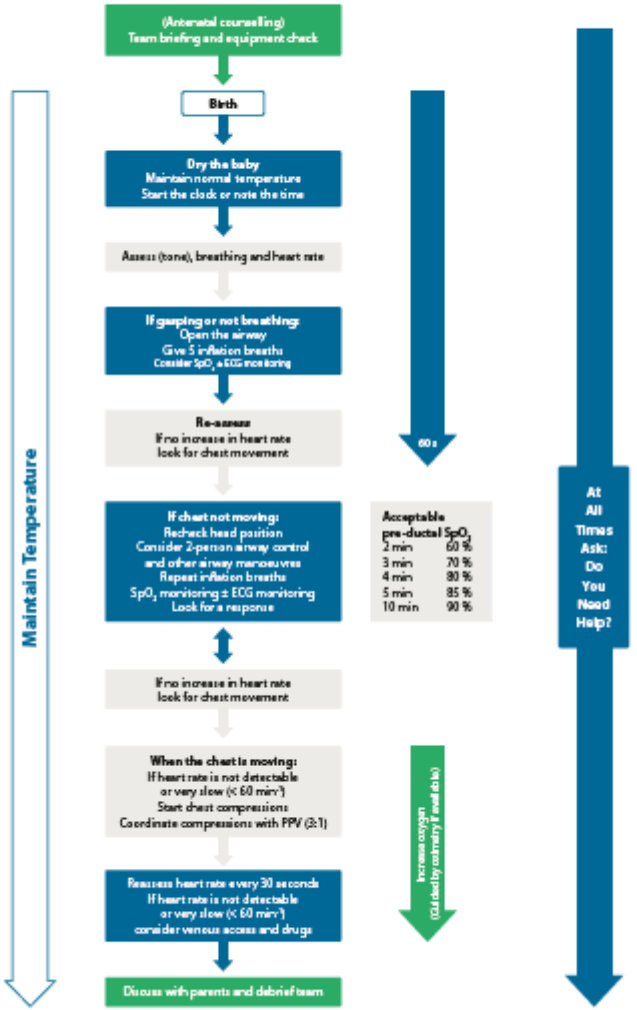
Newborn Life Support



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Published October 2010 by European Resuscitation Council vzw, Emile Vanderveldelaan 66, 2000 Nivelles, Belgium

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Product reference: Poster_NLS_Algorithm_ERC_2010

SEQUENCE / Action		Technical description
SAFETY **Make sure you, the victim and any bystanders are safe**		
RESPONSE **Check the victim for a response**		Gently shake his shoulders and ask loudly: "Are you all right?" If he responds leave him in the position in which you find him, provided there is no further danger; try to find out what is wrong with him and get help if needed; reassess him regularly
AIRWAY **Open the airway**		Turn the victim onto his back if necessary Place your hand on his forehead and gently tilt his head back; with your fingertips under the point of the victim's chin, lift the chin to open the airway Image of Fig. 1.4
BREATHING **Look, listen and feel for normal breathing**		In the first few minutes after cardiac arrest, a victim may be barely breathing, or taking infrequent, slow and noisy gasps. Do not confuse this with normal breathing. Look, listen and feel for **no more** than 10 seconds to determine whether the victim is breathing normally. If you have any doubt whether breathing is normal, act as if it is they are not breathing normally and prepare to start CPR
UNRESPONSIVE AND NOT BREATHING NORMALLY **Alert emergency services**		Ask a helper to call the emergency services (112) if possible otherwise call them yourself Stay with the victim when making the call if possible Activate speaker function on phone to aid communication with dispatcher

UNRESPONSIVE AND NOT BREATHING NORMALLY **Alert emergency services**		Ask a helper to call the emergency services (112) if possible otherwise call them yourself Stay with the victim when making the call if possible A[Image of Fig. 1.4]n on phone to aid communication with dispatcher
SEND FOR AED **Send someone to get AED**		Send someone to find and bring an AED if available. If you are on your own, do not leave the victim, start CPR

Fig. 1.4. Step by step sequence of actions for use by the BLS/AED trained provider to treat the adult cardiac arrest victim.

CIRCULATION

Start chest compressions

Kneel by the side of the victim

Place the heel of one hand in the centre of the victim's chest; (which is the lower half of the victim's breastbone (sternum))

Place the heel of your other hand on top of the first hand

Interlock the fingers of your hands and ensure that pressure is not applied over the victim's ribs

Keep your arms straight

Do not apply any pressure over the upper abdomen or the bottom end of the bony sternum (breastbone)

Position yourself vertically above the victim's chest and press down on the sternum at least 5 cm but not more than 6 cm.

Image of Fig. 1.4

ssion, release all the pressure on the chest without losing contact between your hands and the sternum

Repeat at a rate of 100-120 min^{-1}

IF TRAINED AND ABLE

Combine chest compressions with rescue breaths

After 30 compressions open the airway again using head tilt and chin lift

Pinch the soft part of the nose closed, using the index finger and thumb of your hand on the forehead

Allow the mouth to open, but maintain chin lift

Take a normal breath and place your lips around his mouth, making sure that you have a good seal

Blow steadily into the mouth while watching for the chest to rise, taking about 1 second as in normal breathing; this is an effective rescue breath

Maintaining head tilt and chin lift, take your mouth away from the victim and watch for the chest to fall as air comes out

Take another normal breath and blow into the victim's mouth once more to achieve a total of two effective rescue breaths. Do not interrupt compressions by more than 10 seconds to deliver two breaths. Then return your hands without delay to the correct position on the sternum and give a further 30 chest compressions

Fig. 1.4. (Continued)

		Continue with chest compressions and rescue breaths in a ratio of 30:2
IF UNTRAINED OR UNABLE TO DO RESCUE BREATHS **Continue compression only CPR**		Give chest compressions only CPR (continuous compressions at a rate of 100-120 min^{-1})
WHEN AED ARRIVES **Switch on the AED and attach the electrode pads**		As soon as the AED arrives: Switch on the AED and attach the electrode pads on the victim's bare chest If more than one rescuer is present, CPR should be continued while electrode pads are being attached to the chest
Follow the spoken/visual directions		Ensure that nobody is touching the victim while the AED is analysing the rhythm

If a shock is indicated,

deliver shock

Image of Fig. 1.4

Ensure that nobody is touching the victim

Push shock button as directed (fully automatic AEDs will deliver the shock automatically)

Immediately restart CPR 30:2

Continue as directed by the voice / visual prompts

If no shock is indicated,

continue CPR

Immediately resume CPR. Continue as directed by the voice/visual prompts

Fig. 1.4. (Continued)

IF NO AED IS AVAILABLE CONTINUE CPR

Continue CPR

Do not interrupt resuscitation until:

- a health professional tells you to stop
- the victim is definitely waking "up", moving, opening eyes and breathing normally
- you become exhausted

IF UNRESPONSIVE BUT BREATHING NORMALLY

If you are certain the victim is breathing normally but is still unresponsive, place in the recovery position (see First aid chapter).

It is rare for CPR alone to restart the heart. Unless you are certain the person has recovered continue CPR

Signs the victim has recovered

- waking up
- moving
- opens eyes
- normal breathing

Be prepared to restart CPR immediately if patient deteriorates


KEEP
CALM
AND DO CPR WITH
GOOD CHEST
COMPRESSION