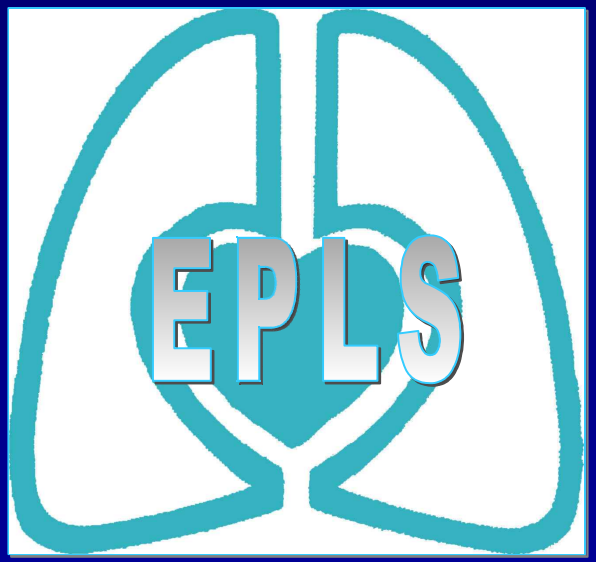
European Resuscitation Council

Paediatric ALS 2005



Content

- Airway
  LMA, cuffed tube
- Breathing
  Hyperventilation, ET CO2
- Circulation
  Tracheal access
  Adrenaline, glucose, lidocaine, vasopressin
- Defibrillation
  Doses, biphasic, algorithm
- Post-Resuscitation
  Hypothermia

Airway: LMA

- Not a first choice in resuscitation
- Acceptable for experienced providers in children

Airway: tracheal tube

- Tape measurement is more accurate than formulae
- Prehospital uncuffed TT (up to 5.5)
- In- hospital: cuffed TT acceptable
  - Leak, ARDS, non-compliant lungs
- Monitoring of cuff pressure (20 cm H2O)

Breathing: ventilation during and after CPR

- Hyperventilation :
  - ⇗ intrathoracic pressure
  - ⇘ cerebral & coronary perfusion
- Ideal tidal volume = modest chest wall rise

Avoid hyperventilation
Maintain normal $PaCO_2$: 35-45 mm Hg

Breathing : respiratory frequency

- During CPR when airway is secured : 10/min
- If CO : 12-20/min according to age

Breathing : monitoring of $EtCO_2$

- ✓ In pre- & in-hospital setting
- ✓ In any intubated child > 2 kg
- ✓ In any transportation
- ✓ Low or absent $EtCO_2$
  - Oesophageal intubation
  - Absence or low pulmonary BF (shock states or CA)

Circulation : vascular access

- ✓ IV & IO always better than ET
- ✓ Give adrenaline only once by ET access

Circulation : adrenaline

- Infant and child
  - IV-IO : 10 mcg/kg for every doses
  - ET : 100 mcg/kg
- Newborn
  - IV-IO : 10 - 30 mcg/kg
  - ET : try to avoid – if required 100 mcg/kg

Circulation : medications

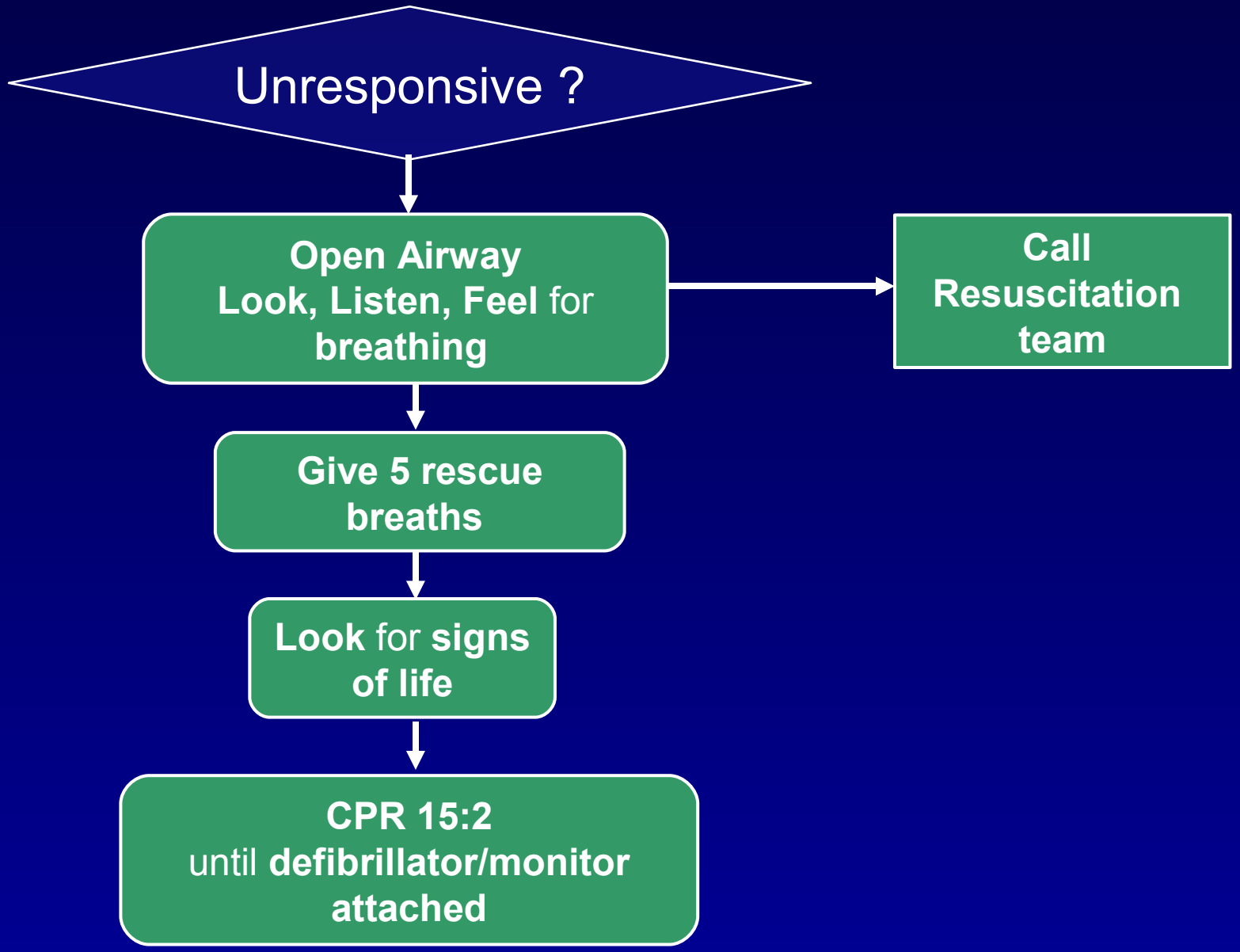
- ✓ No glucose containing solutions during CPR
- ✓ Avoid hyper-, hypoglycaemia after ROSC
- ✓ Lidocaine ≠ first line treatment for VF/pulseless VT
- ✓ Vasopressin : insufficient data
  - Rescue therapy ? International protocol?

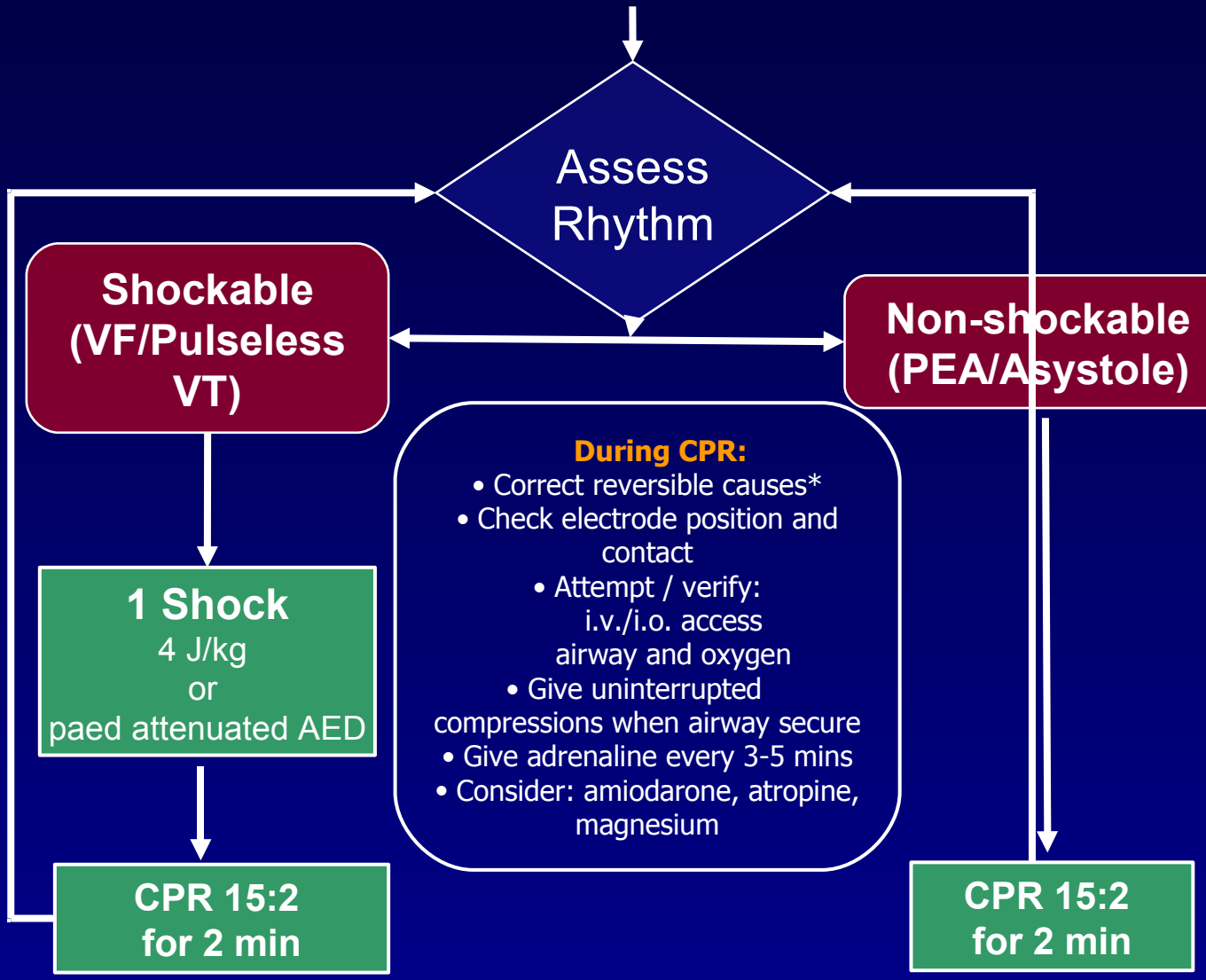
Circulation : defibrillation

- ✓ Optimal paddle force
  - 3 kg for child < 10 kg
  - 5 kg for child > 10 kg
- ✓ Biphasic waves (versus monophasic)
  - As effective
  - Less myocardial dysfunction

Circulation : defibrillation doses

- ✓ No stacked doses
- ✓ Dose : 4 J/kg for every single shock
  - Monophasic or biphasic
- ✓ No escalation
- ✓ Animal model
  - better results with 3-4 J/kg than with lower or adult doses
  - No myocardial damage with dose ≥ 9 J/kg


Unresponsive ?
Open Airway
Look, Listen, Feel for breathing
Call Resuscitation team
Give 5 rescue breaths
Look for signs of life
CPR 15:2
until defibrillator/monitor attached



*** Reversible Causes**

Hypoxia	**T**ension Pneumothorax
Hypovolaemia	**T**amponade, cardiac
Hypo/hyperkalaemia/Metabolic	**T**oxins
Hypothermia	**T**hrombosis (coronary or pulmonary)

Start CPR as soon as possible

VF/pulseless VT

Give a single shock 4 J/Kg as soon as defibrillator is available

Don’t feel the pulse - Give 2 min CPR - Check monitor

Give a single shock 4 J/kg

2 min CPR – check rhythm- Give adrenaline 10 mcg/kg (every 2 loops)

Give a single shock 4 J/Kg

DRUG – SHOCK – CPR - RHYTHM CHECK

2 min CPR -– check rhythm - Give amiodarone 5 mg/kg

Give a single shock 4 J/Kg

drug, shock, CPR, rhythm check

- ✓ Adrenaline circulated by CPR after shock
- ✓ Adrenaline every two loops
- ✓ Change individual providing compression every 2 min

Circulation : defibrillation

- Place gel/ pads on chest
- Select energy : 4 J/kg
- Stop chest compressions and remove high flow oxygen
- Charge the defibrillator with paddles on chest
- “STAND CLEAR”
- Check that nobody is in contact with the patient / bed
- Check monitor for VF/VT and deliver shock
- Replace paddles on the defibrillator
- Return to CPR immediately

Circulation: minimise CPR interruption

Palpate briefly a pulse only if :

- modification of the arrest rhythm
- non-shockable / organised rhythm
- In VF/VT only after 2 min CPR (except if signs of life)
- In doubt resume CPR

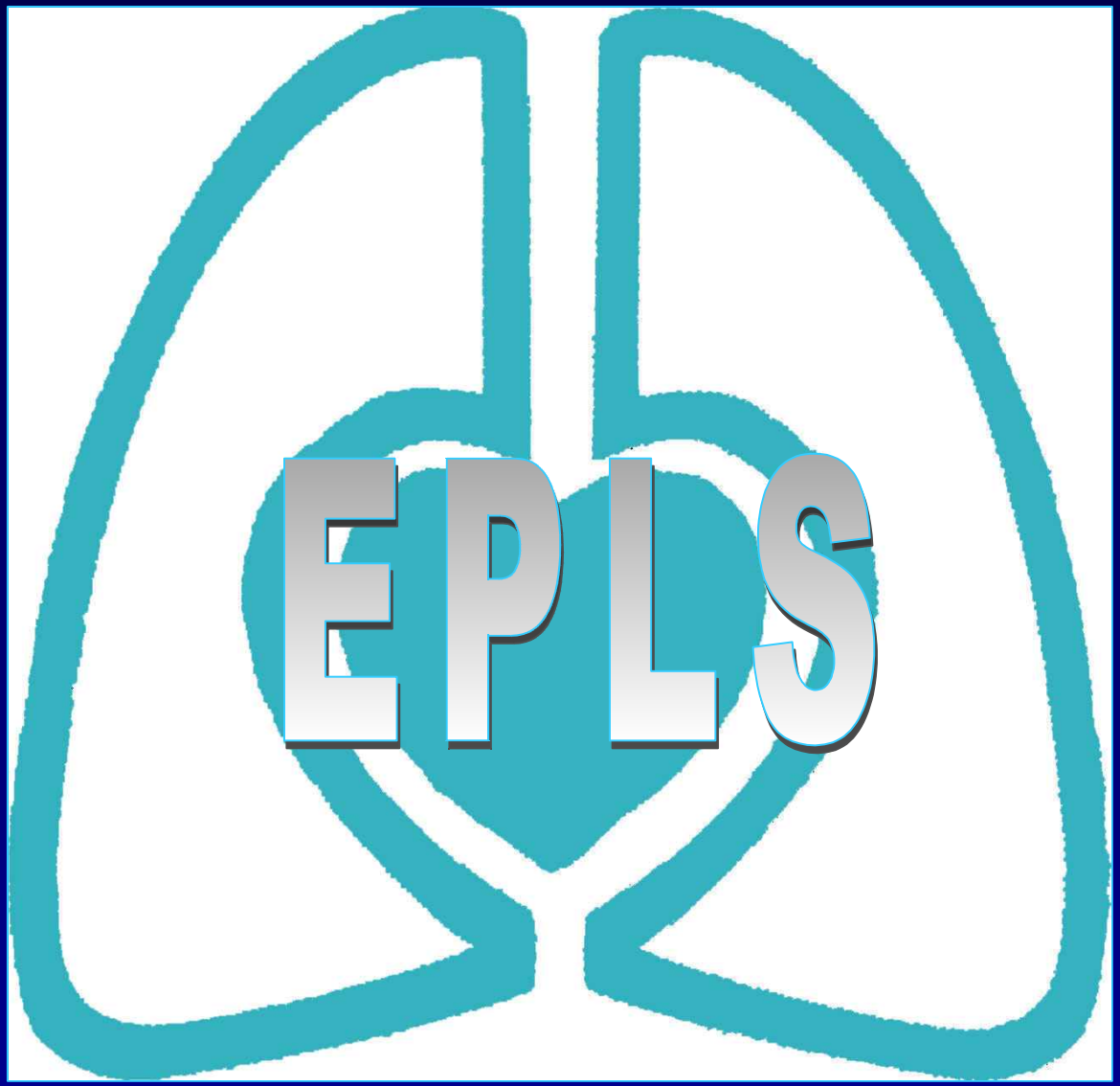
Temperature management

For child comatose after ROSC :

- ✓ Aggressively control hyperthermia
- ✓ Do not rewarm if hypothermic (if >32°C)
- ✓ Cooling down to 32-34°C for 12-24 hours
- ✓ Avoid shivering (analgesia, NM blockade)
- ✓ After 12-24 hours, rewarm by 0.25-0.5°C per hour
- ✓ Check for infection, CV instability, coagulopathy, hyperglycaemia, electrolytes abnormalities

Summary

- ✓ Avoid hyperventilation during CPR
- ✓ Prefer IV/IO to TT access
- ✓ New VF/VT algorithms :
  - Single shock
  - Minimise CPR interruption
  - No pulse palpation except if rhythm change
  - Adrenaline before 3rd shock, then every two loops
  - Amiodarone before 4th shock
- ✓ Avoid hyperthermia
- ✓ Hypothermia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