## APLS

### Differences in Kids

***Airways***

- Upper
  - Large head
  - Short neck
  - Small mandible
  - Loose teeth
  - Large tongue
  - Compressible floor
  - Large tonsils
- Lower
  - Epiglottis ***horseshoe*** shaped, projects 45° post
  - ***Larynx Level C2/3*** (vs 5/6 adults)
  - Cricoid ring
    - narrowest (vs larynx) = more likely oedema
    - lined with pseudo-stratified cells

***Breathing***

- Small (absolute)
- More ***diaphragmatic*** breathing
- Less Type I = more ***fatiguable***
- Horizontal ribs = ***less expansion***
- More compliant ribs = ***less protection***

***Circulation***

- Volume 80ml/kg vs adults 70ml/kg
- Total volume less

***TBSA***

- More in head (19%) → 9% by adolescence

### Life Support

***BLS***

*DRSABC*

Danger
Response
Send for help (SFH)
- ≥ 1 rescuer = BLS/SFH simultaneous
- 1 rescuer = 1min CPR → SFH
- 1 rescuer witnessed = SFH/Defib → CPR

Airway
Breathing
Circulation

***ALS***

| | | |
|---|---|---|
| - ***Adrenaline*** | 10 | mcg/kg |
| - ***Amiodarone*** | 5 | mg/kg |
| - Shock | 4 | J/kg |
| - ***$NaHCO_3$*** | 1 | mmol/kg |
| - AED ≥ 8yo | | |

***Compressions***

*Compression: Breath, all at 100 BPM*

- 3:1 Neonates
- 15:2 Paeds
- 30:2 Adults

### Bradyarrythmias

***Causes***

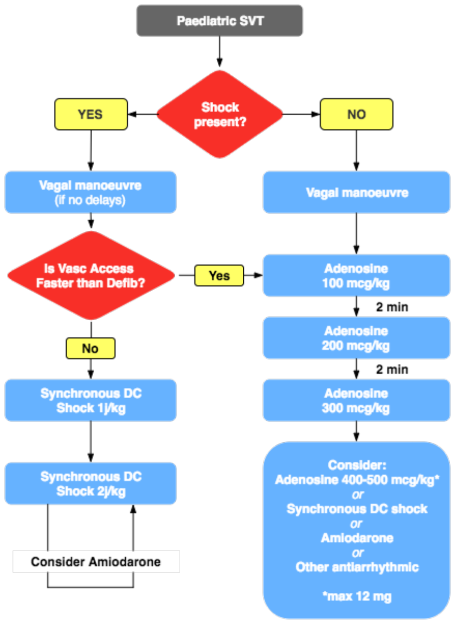
- Pre-terminal
- ↑ICP
- Iatrogenic eg ETT
- HB
- Toxins
- Long QT
- Post CTS

***Mx***

| | | |
|---|---|---|
| 1. ***Atropine*** | 20 | mcg/kg |
| 2 ***Adrenaline*** | 10 | mcg/kg |
| 3. Pacing | | |

### SVT

- Shock = ***1J/kg → 2J/kg sync → Amio***
- Non-shock
  1. Vagal manoeuvres
  2. ***Adenosine*** 100 → 200 → 300 mcg/kg
  3. 400-500mcg/kg vs DCCV vs ***Amio***




**DO NOT give verapamil to paedaitric SVT**

### Duct Dependant Lesions

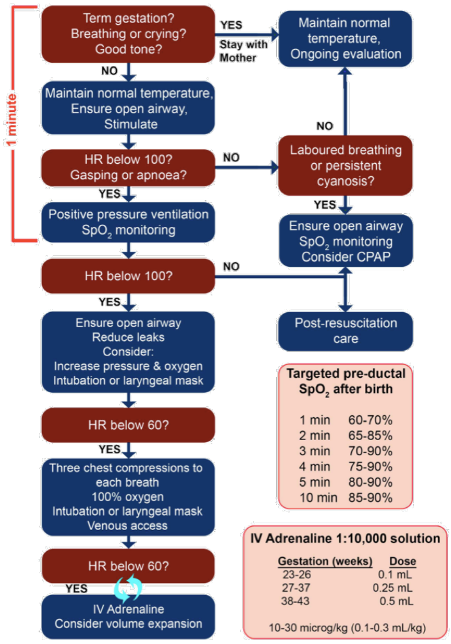
- Call for help!
- **DOES NOT** respond to supp $O_2$
- Limit $O_2$ Sat 94%
- ***Cefotaxime*** 50 mg/kg
- ***$PGE_1$*** 50 ng/kg/min

*TOF: OVRR (overriding Ao, VSD, RVH, RVOF obstruction)*

## NEONATAL RESUS

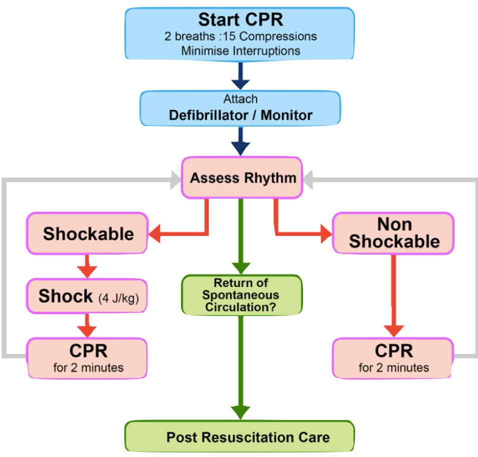
***Principles***

- Dry
- Warm
- Stimulate
- Optimise airway (head position)
- Assisted ventilation: ***Give AIR*** (not $O_2$) PPV
- CPR if HR < 60; 3:1 Compressions:breath




***NeoPuff Settings***

| | | |
|---|---|---|
| - PIP | 30 | cm$H_2O$ |
| - PEEP | 8 | cm $H_2O$ |
| - Max Pressure | 40 | cm $H_2O$ |
| - Gas supply | 5-15 L/min | |



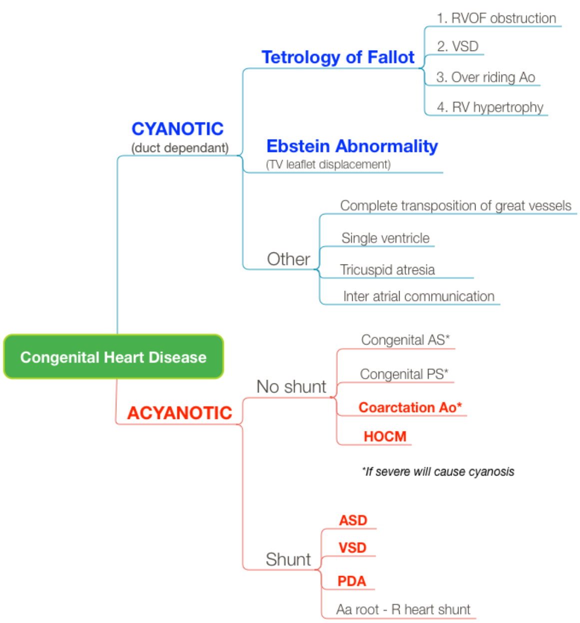

**During CPR**
Airway adjuncts *(LMA / ETT)*
Oxygen
Waveform capnography
IV / IO access
Plan actions before interrupting compressions
*(e.g. charge manual defibrillator to 4 J/kg)*

**Drugs**
**Shockable**
* Adrenaline 10 mcg/kg after 2nd shock *(then every 2nd loop)*
* Amiodarone 5mg/kg after 3 shocks

**Non Shockable**
* Adrenaline 10 mcg/kg immediately *(then every 2nd loop)*

**Consider and Correct**
Hypoxia
Hypovolaemia
Hyper / hypokalaemia / metabolic disorders
Hypothermia / hyperthermia
Tension pneumothorax
Tamponade
Toxins
Thrombosis *(pulmonary / coronary)*

**Post Resuscitation Care**
Re-evaluate ABCDE
12 lead ECG
Treat precipitating causes
Re-evaluate oxygenation and ventilation
Targeted Temperature Management



## PAEDIATRIC VITAL SIGNS

| Age | HR | RR | SBP |
|---|---|---|---|
| Neonate | 130 ± 30 | 25-50 | 60-70 |
| 6m | | | 70-100 |
| 1y | 120 ± 30 | | |
| 2-5y | 110 ± 30 | 20-30 | 80-110 |
| > 5y | 100 ± 20 | 15-25 | 90-115 |

**Weight**

| | | |
|---|---|---|
| 0-12m | $x$ ÷ 2 + 4 | *(age in units of age range)* |
| 1-5y | $x$ × 2 + 8 | |
| 6-12y | $x$ × 3 + 7 | or/ (age + 4) x 2 (1-10yo) |

## APLS DRUGS

### Emergency Drugs

| | | | |
|---|---|---|---|
| ***Adrenaline*** | IV/IO | 0.01 | mg/kg |
| | IM | 0.01 | mg/kg |
| | ETT | 0.10 | mg/kg |
| | Neb | 0.50 | mg/kg |
| ***Amiodarone*** | IV | 5 | mg/kg |
| ***Midazolam*** | IV | 0.15 | mg/kg |
| | IM | 0.20 | mg/kg |
| ***Insulin*** | IV | 0.1 | **u/kg** |
| ***Lignocaine*** | IV | 1 | mg/kg |
| ***$PGE_1$*** | IV | 10-50 | **ng/kg** |

*Adrenaline 1:10,000 = 1mg/10ml*
*Adrenaline 1:1,000 = 1mg/1ml (for anaphylaxis)*

***Adenosine***: 0.1 → 0.2 → 0.3 → 0.4-0.5 mg/kg

### Emergency Fluids

| | | | |
|---|---|---|---|
| ***Crystalloid*** | IV | 20 | ml/kg |
| ***10% Dex*** | IV | 2 | ml/kg |
| ***Mannitol*** | IV | 2.5-10 | ml/kg |
| ***3% Saline*** | IV | 5-10 | ml/kg |

*3% Saline better than mannitol if unstable*

### Electrolytes

| | | | |
|---|---|---|---|
| ***KCL*** | IV | 0.2 | mmol/kg |
| ***10% CaGlu*** | IV | 0.5 | ml/kg |
| ***$MgSO_4$*** | IV | 25 | mg/kg |
| ***$NaHCO_3$*** | IV | 1 | mmol/kg |

### Rapid Sequence Intubation

| | | | |
|---|---|---|---|
| ***Ketamine*** | IV | 1-2 | mg/kg |
| ***Propofol*** | IV | 1-2 | mg/kg |
| ***Thiopentone*** | IV | 2-5 | mg/kg |
| ***Sux*** | IV | 1-2 | mg/kg |
| ***Rocuronium*** | IV | 1.2 | mg/kg |
| ***Atropine*** | IV | 0.02 | mg/kg |

## EQUIPMENT

| | | | |
|---|---|---|---|
| **DCCV** | ALS | 4 | j/kg |
| | Awake | 1 | j/kg |
| **ETT** | age ÷ 4 + 4 (uncuffed) | | |
| **Length** | age ÷ 2 + 12 (or x3 ETT) | | |

## KETAMINE PROCEDURAL SEDATION

| | IM | IV |
|---|---|---|
| Bolus | 3-4mg/kg | 1-1.5mg/kg |
| Titrate | 2-4mg/kg | 0.5mg/kg |
| Onset | 5min | 1min |
| Duration | 15-30min | 10-20min |
| Discharge | 120min | 100min |
| Advantages | No IV | Rpt dosing |

*Adjuncts: atropine 0.02mg/kg max 0.6mg, midazolam 0.15mg/kg if > 5yo*

## SEIZURES

| | Drug | Dose[1] | Route |
|---|---|---|---|
| 1st | ***Midazolam*** | 0.15,0.20, 0.50 | IV/IM/ Buccal |
| | ***Diazepam*** | 0.25, 0.5 | IV/PR |
| | ***Lorazepam*** | 0.1 | IV |
| 2nd | ***Phenytoin*** | 20 | IV |
| | ***Phenobarbitone[2]*** | 20 | IV |
| | ***Paraldehyde*** | 0.3 | PR |
| RSI | ***Thiopentone*** | 2-5 | IV |
| | ***Propofol*** | 1-2 | IV |
| | ***Suxemethonium*** | 1-2 | IV |

*[1]All doses mg/kg except paraldehyde ml/kg*
*[2]Use if already on phenytoin*

## ANALGESIA

***Mild***

| | |
|---|---|
| ***Paracetamol*** | 20mg/kg stat→15mg/kg or 40mg/kg PR |
| ***Ibuprofen*** | 10mg/kg |
| ***Sucrose*** | 0.2-1ml |

***Moderate***

| | |
|---|---|
| ***Codeine*** | 0.5-1 mg/kg |
| ***Oxycodone*** | 0.1-0.2 mg/kg |

***Severe***

| | |
|---|---|
| ***Morphine*** | 0.1mg/kg, 0.05mg/kg |
| ***Fentanyl*** | 0.5 μg/kg IV, **1.5 μg/kg IN** |
| ***Ketamine*** | 0.1-0.3mg/kg IV, 0.5-1.0mg/kg IM |
| | NB ***adults 0.3 mg/kg*** |

***Adjuncts***

| | |
|---|---|
| - ***NO*** | - Splint/Sling/Crutches |
| - ***Midazolam*** | - Ice |
| - Distraction | - Elevate |

## DEHYDRATION

| Property | 0 | 1 | 2 |
|---|---|---|---|
| **Look** | Normal | Thirsty, resultless, irritable, CCR >2s | Drowsy, limp, cold, CCR > 3s, coma |
| **Eye** | Normal | Slightly sunken | Very sunken |
| **MM** | Moist | Sitcky | Dry |
| **Tears** | Normal | Reduced | Absent |

***Interpretation***

| | | |
|---|---|---|
| 0 | non dehydration | < 3% |
| 1-4 | moderate | 3-6% |
| >4 | severe | > 6% |

***Calculating Deficit***

Deficit replacement = % x 10 x weight = ml/24hrs

### Maintenance Fluids

| | | |
|---|---|---|
| 4ml/kg | 1st 10kg + | Use 0.9% ***Saline*** |
| 2ml/kg | 2nd 10kg + | + 5% ***Dextrose*** |
| 1ml/kg | > 20kg | + 20 mmol/L ***KCL*** |
| | | *2/3 maintenance if sick |