

Ambulance Pocket Book

V 3.0



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Contents

Prompt cards

- 1.1 Priority call
- 1.2 Trauma handover
- 1.3 Medical handover
- 1.4 SPEEDBOMB

ALS

- 2.1 ALS algorithm
- 2.2 Protocol C
- 2.3 Prot. C exclusions
- 2.4 ALS o/a
- 2.5 ALS initiated
- 2.6 Post-ROSC
- 2.7 Pre-departure
- 2.8 Tachycardia
- 2.9 Bradycardia
- 2.10 ECG diagnosis
- 2.11 Sgarbossa
- 2.12 Desbrien's '3&3'

Paediatrics

- 3.1 Parameters
- 3.2 Causes: D.I.B.
- 3.3 Peak flow chart
- 3.4 Causes: L.O.C.
- 3.5 GCS
- 3.6 WETFLAG

Maternity

- 4.1 Shoulder dystocia
- 4.2 Breech birth
- 4.3 Neonatal resuscitation
- 4.4 APGAR

Assessment Tools

- 5.1 NEWS
- 5.2 Cranial nerves
- 5.3 Formulas
- 5.4 Rule of nines

Information

- 6.1 East Kent map
- 6.2 Trauma network distances
- 6.3 Adult peak flow
- 6.4 Airway circuit
- 6.5 Ear-to-sternal notch airway management
- 6.6 Parapac settings
- 6.7 RSI indications
- 6.8 Arterial Blood Gases
- 6.9 Lethal triad
- 6.10 Pelvic fractures
- 6.11 Brain areas
- 6.12 Limb ischaemia
- 6.13 Ca staging
- 6.14 Live cables
- 6.15 Worsening care advice



Prompt cards

Priority call

Age / Sex

Nature of call

Vital signs (relevant)

Temp, RR, HR, BP, SpO2, BSL, RTS

Interventions

IV access, IV fluids

ETI, CPR, # shocks given

Drugs

Code red? (Request blood)

ETA

TRAUMA handover

Name / Age / Location	
MOI	
GCS	
Injuries (top to toe)	
Interventions / Drugs	
Volume issue?	Y / N
Transfer?	Stable / Unstable
Immediate concerns	

Loseby et al (2013). *Jou. Para. Prac.* 5(10) 563-567

MEDICAL handover

Name / Age / Location

PC

PMHx

Working Dx / Clinical findings

Investigations

Interventions / Drugs

Immediate concerns

SPEEDBOMB

Suction
Positioning
ETI equipment
ETCO²
Drugs and IVC
Backup airways
Oxygen
Monitoring
Briefing

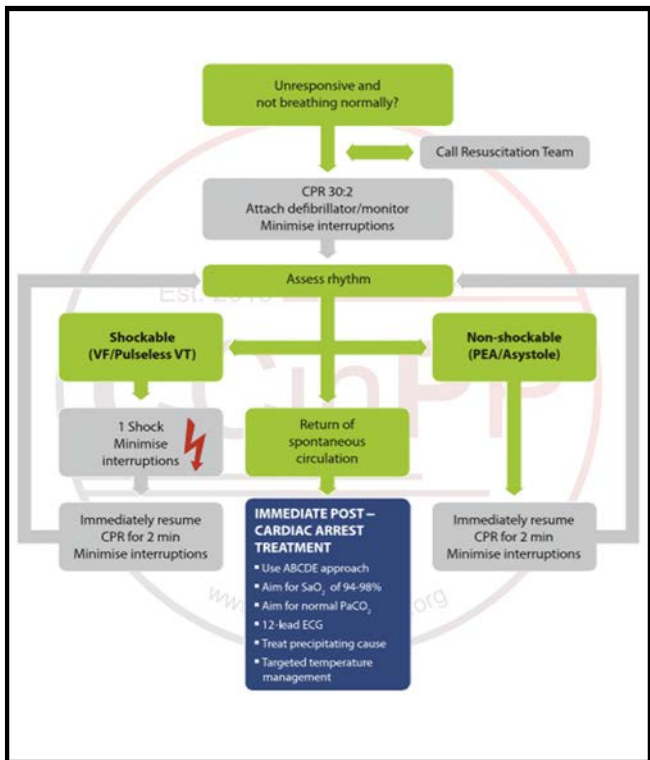


Minh Le Cong (2014).@ketaminh. [www.twitter.com](https://www.twitter.com/ketaminh)

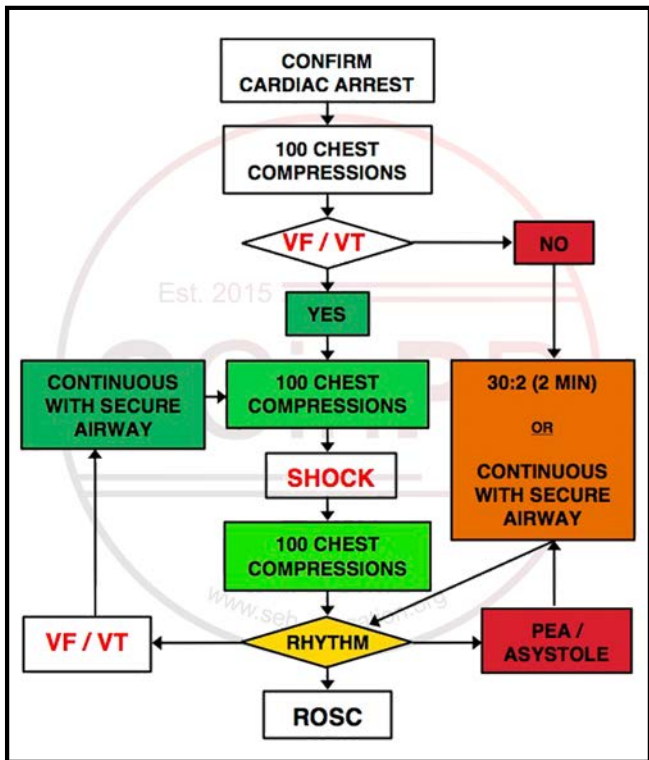


Advanced Life Support

Advanced Life Support



Protocol C



Chamberlain et al. 'Protocol C explained' www.secamb.nhs.uk

Protocol C exclusions

- 1.** Cardiac arrest that occurs in a patient where there is a defibrillator immediately available.
- 2.** Cardiac arrest in victims known to be pregnant.
- 3a.** Cardiac arrest due to asphyxia (drowning, suffocation, choking).
- 3b.** Cardiac arrest with an interval from call to arrival of more than 15 minutes (implying collapse to definitive treatment of more than 20 minutes).
- 3c.** Cardiac arrest complicated by trauma or drug use (whether or not a cardiac cause is suspected).
- 3d.** Cardiac arrest in victims believed to be less than 18 years of age.

ALS on arrival

Are there effective chest compressions?

Are compressors changing regularly?

Is the defibrillator in manual mode?

Is there sufficient O²? Is it attached to the BVM and is the bag inflated?

Is there adequate chest rise?

Have CCPs/HEMS been considered?

Has a second crew been requested?

Is the family being supported?

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ALS initiated

Does everyone know eachothers names and grades?

Are effective compressions ongoing?

Is there an **ETCO²** waveform present and printed? Is it within an acceptable range?

Is there bilateral air entry?

Has a **TPX** been ruled out?

Is there a rhythm check every two minutes?

Is the patient cannulated? Is it patent?

Has **NaCl** been given?

Has **Adrenaline** and **Amiodarone** been given? (If required)

Address reversible causes

Post-ROSC

A

Secure airway

Monitor SpO₂

Target ETCO₂ (4.5 – 5.5)

B

Monitor ventilation rate and volume
(tidal volume 7ml/kg)

Est. 2015

C

Keep patient flat

Obtain serial 12 leads

Consider pPCI

Serial NIBP (maintain >90mmHg)

D

Monitor BM

Keep patient cool (avoid
hyperthermia)

Manage seizures appropriately
half-dose initially (may drop BP)

E

Kit on board

Control updated

Priority call prepared

Pre-departure checklist

A ETCO² trace
Bite block
Back-up airway equipment

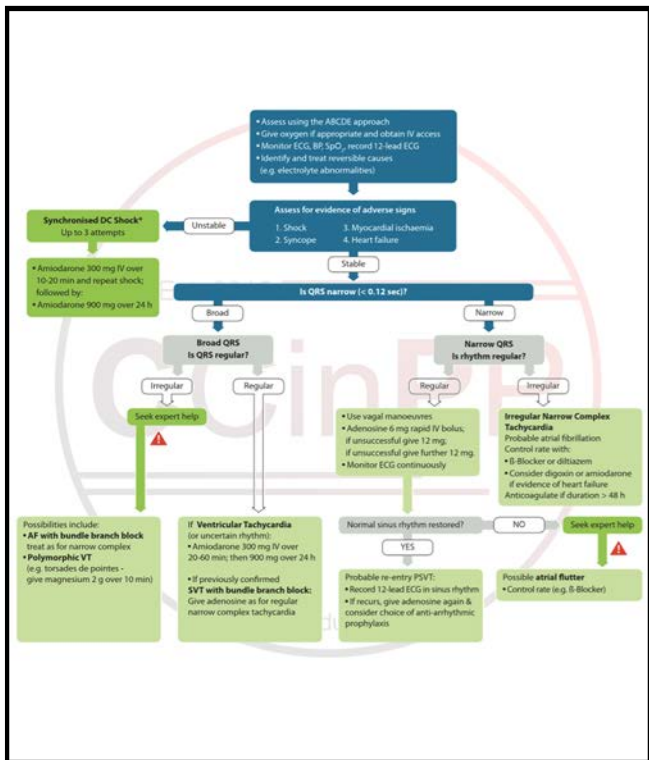
B SpO² (with trace)
Ventilator settings
Sufficient O²

C Fluids?
TXA?

D BSL checked and recorded
Temperature managed
Analgesic
Antiemetic

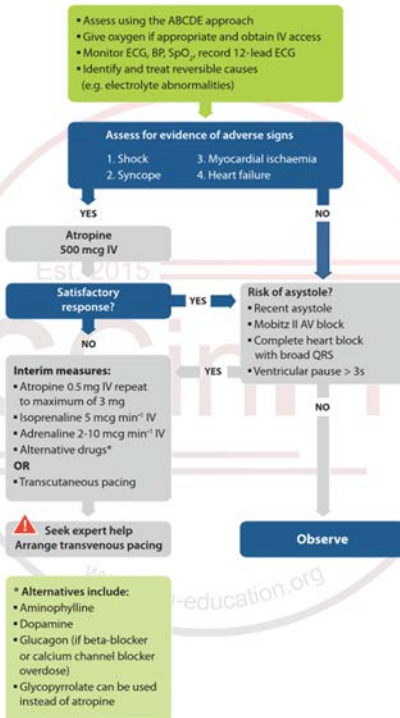
E Kit on board
Control updated
Priority call prepared (Code Red?)

Tachycardia (with pulse)



European Resuscitation Council (2015)

Bradycardia



ECG diagnosis

Rate (60-100)

Regularity

Axis deviation?

Atria

- **P waves present?** *Atrial Fibrillation*
- **PR interval (0.12-0.2)** *Blocks / WPW*

Ventricles

- **QRS (<0.11)** *Bundle Branch Blocks*

Ischaemia

- **ST elevation / depression** *pPCI?*
- **T wave inversion** *NSTEMI?*
- **R wave progression**
- **Pathological Q waves**

Budd, S. (2016). 'ECG Rules Revised'

Sgarbossa criteria



Concordant ST-Elevation
>1mm
5 points



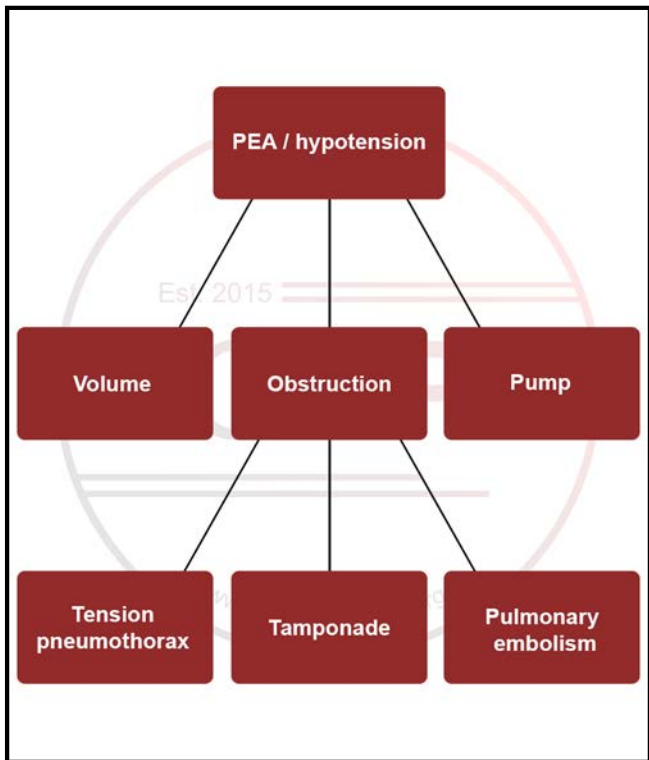
Concordant ST-Depression
>1mm
V1, V2, V3
3 points



Discordant ST-Elevation
>5mm
2 points

≥3 points = 90% specificity of STEMI
(sensitivity of 36%)

3 and 3



Desbien (2008). *Crit. Care Med.* 36(2) 391-396



Paediatrics

Parameters

Respiratory rate

<1 month:	30 – 40
1-5 years:	25 – 30
5-12 years:	20 – 25
≥12 years:	12 – 20

Sats

93% normal

85% onset of cyanosis

<75% unreliable

Peak flow

(5 x height in cm) - 400

Heart rate

<1 month:	110 – 160
1-5 years:	95 – 140
5-12 years:	80 – 120
≥12 years:	60 – 100

Blood pressure

Systolic:	$82 + (\text{age} \times 2)$
Diastolic:	$52 + \text{age}$

Causes: Breathing difficulties

Mechanism	Causes
Upper airway obstruction	Croup / Epiglottitis Foreign body
Lower airway obstruction	Tracheitis Asthma / viral associated wheeze Bronchiolitis
Disorders affecting lungs	Pneumonia Pulmonary oedema
Disorders around the lungs	Pneumothorax Pleural effusion / empyema Rib fractures
Disorders of the respiratory muscles	Neuromuscular disorders
Disorders below the diaphragm	Peritonitis Abdominal distension
Increased respiratory drive	Diabetic ketoacidosis Shock Poisoning (e.g. Salicylates) Anxiety / hyperventilation
Decreased respiratory drive	Coma Convulsions Raised ICP Poisoning

Advanced Life Support Group (2016) *Paediatric ALS*

Peak flow (paediatric)

Height (m)	Height (ft)	Predicted EU PEFR (L/min)
0.85	2'9"	87
0.90	2'11"	95
0.95	3'1"	104
1.00	3'3"	115
1.05	3'5"	127
1.10	3'7"	141
1.15	3'9"	157
1.20	3'11"	174
1.25	4'1"	192
1.30	4'3"	212
1.35	4'5"	233
1.40	4'7"	254
1.45	4'9"	276
1.50	4'11"	299
1.55	5'1"	323
1.60	5'3"	346
1.65	5'5"	370
1.70	5'7"	393

Causes: Unconsciousness

Hypoxic ischaemic brain injury following respiratory or circulatory failure
Epileptic seizures
Trauma <ul style="list-style-type: none">Intracranial haemorrhageBrain swelling
Infections <ul style="list-style-type: none">MeningitisEncephalitisCerebral and extracerebral abscessesMalaria
Intoxication
Metabolic <ul style="list-style-type: none">Renal or hepatic failureHypo- or hyper- natraemiaHypoglycaemiaHypothermiaHypercapniaInherited metabolic disease
Cerebrovascular event, secondary to arteriovascular malformation (AVM) or tumour
Cerebral tumour
Hydrocephalus, including blocked intraventricular shunts

Advanced Life Support Group (2016) *Paediatric ALS*

GCS (paediatric)

Eye opening

- 4 Spontaneous
- 3 To speech
- 2 To pain
- 1 None

Verbal

- 5 Babbles, coos, speech to normal ability
- 4 Less than usual ability, irritable cry
- 3 Cries to pain
- 2 Moans to pain
- 1 None

Motor

- 6 Moves spontaneously or purposefully
- 5 Withdraws from touch
- 4 Withdraws from nailbed pain
- 3 Abnormal flexion (decorticate rigidity)
- 2 Extension (decerebrate rigidity)
- 1 None

WETFLAG

Weight

<1 month:	(age in months + 9) / 2
1-9 years:	(age + 4) 2
9-12 years:	age x 3
≥12 years:	age x 3 (round up)

Energy

Cardiac arrest:	4j/kg
Cardioversion:	1j/kg → 2j/kg → 4j/kg

Tube size

Int. diameter (cuffed):	(age / 4) + 4
Length at teeth:	(age / 2) + 12

FLuids

Illness and resuscitation:	20 ml/kg
Trauma and cardiac:	10 ml/kg

Adrenaline

Resuscitation:	0.1 ml/kg (1:10,000)
Asthma/anaphylaxis:	0.01 ml/kg (1:1,000)

Glucose 10%

<1 month:	2.5 ml/kg
≥1 month:	2 ml/kg

Advanced Life Support Group (2016) *Paediatric ALS*



Maternity

Shoulder dystocia

Do not cut cord before delivery
Do not press on uterine fundus

Two unsuccessful contractions = dystocia

McRoberts

Two attempts

Suprapubic (constant)

Two attempts

Suprapubic (intermittent)
 *empty bladder

Two attempts

All fours

Two attempts

Time critical transfer

High-flow O₂

Do not wait for a midwife

Can walk **short** distance

Breech birth

*If delivery not in progress, transfer mother to **booked obstetric unit**.*

Feet or buttocks first = breech

Edge of bed and
support legs

↓
Umbilicus facing
mothers anus

↓
Lift feet as head delivers

↓
More likely to require
resuscitation

↓
**Any presenting body part other than
head, buttocks, or feet: transfer rapidly
to obstetrics with priority call.**

JRCALC (2013). *Clin. Prac. Guid..* p. 261



APGAR

	0	1	2
A appearance	Cyanosed	Peripherally cyanosed	No cyanosis
P pulse	<60	60-100	>100
G grimace	None	Grimace/ feeble cry	Normal
A activity	None	Some flexion	Active movement
R respirations	None	Weak or irregular	Strong

Wikipedia (2014) *Apgar score*.



Assessment tools

National Early Warning Score

PHYSIOLOGICAL PARAMETERS	3	2	1	0	1	2	3
Respiration Rate	≤8		9 - 11	12 - 20		21 - 24	≥25
Oxygen Saturations	≤91	92 - 93	94 - 95	≥96			
Any Supplemental Oxygen		Yes		No			
Temperature	≤35.0		35.1 - 36.0	36.1 - 38.0	38.1 - 39.0	≥39.1	
Systolic BP	≤90	91 - 100	101 - 110	111 - 219			≥220
Heart Rate	≤40		41 - 50	51 - 90	91 - 110	111 - 130	≥131
Level of Consciousness				A			V, P, or U

*The NEWS system is based on the Royal College of Physicians' NEWS Development and Implementation Group (2012) report and uses points awarded and linked to interventions with the Royal College of Physicians' Royal College of Nursing, National Clinical Practice and Early Warning for Acute Care.

Cranial nerves

Cranial nerve	Test	Pathological signs
I – Olfactory	Smelling substances	Hyposmia, anosmia
II – Optic	Visual field and acuity	Reduced field or acuity
III – Oculomotor	Pupillary reaction and accommodation, 'H' test	Gaze paresis, nystagmus, anisocoria
VI – Abducens		
V – Trigeminal	Facial sensation, jaw muscles, masseter palpation	Loss of sensation
V – Facial	Facial muscles (brow furrow, eyes scrunched, puff cheeks)	Loss of muscular strength
VIII – Auditory	Light noises, balance and gait tests	Hypo-, hyper- or anacusis, Romberg +ve
IX – Glossopharyngeal	Gag reflex, swallowing, hoarseness	Uvular deviation, hoarse voice
X – Vagus		
XI – Accessory	Head turning and shoulder shrugging against resistance	
XII – Hypoglossal	Tongue protrusion	Unilateral paresis (deviates to healthy side)

Schiefer et al, Clinical Neuro-ophthalm., A practical guide (2007)

Formulas

Parkland

$$(4 \times \text{___ kg}) \% \text{ TBSA} = \text{___ ml} / 2 = \text{___ ml}$$

** to be given over 8 hours*

Blood Volume (adult)

$$(\text{___ kg} / 100) 7 = \text{___ litres}$$

Weight (paediatrics)

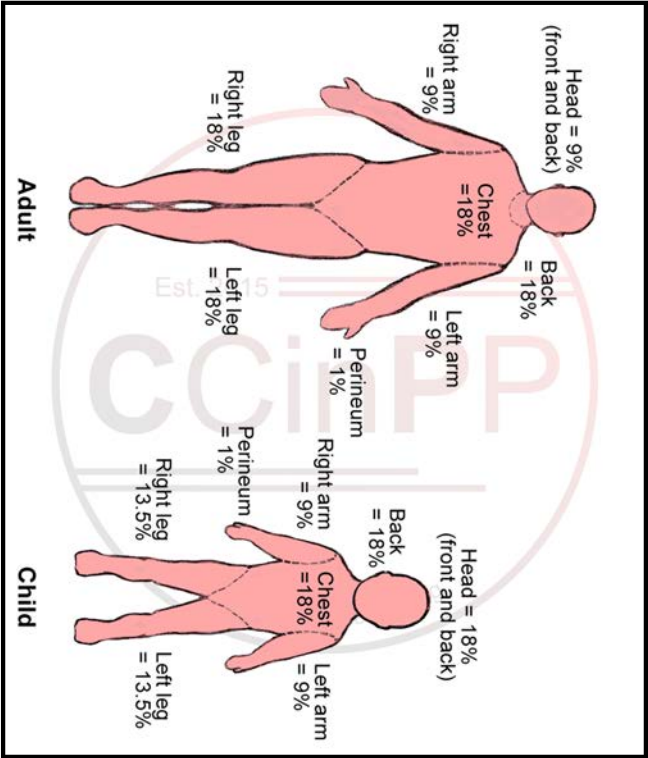
$$(\text{___ years old} + 4) 2 = \text{___ kg}$$

ET Tube (paediatrics)

$$(\text{___ years old} / 4) + 4 = \text{___ mm}$$

The EMT Spot (2011) 'What is Par. For?'. www.theemtpot.com
Aus. Red Cross (2014). 'Haemorrhage'. www.transfusion.com.au
ERC (2011). www.resus.org.uk

Rule of nines



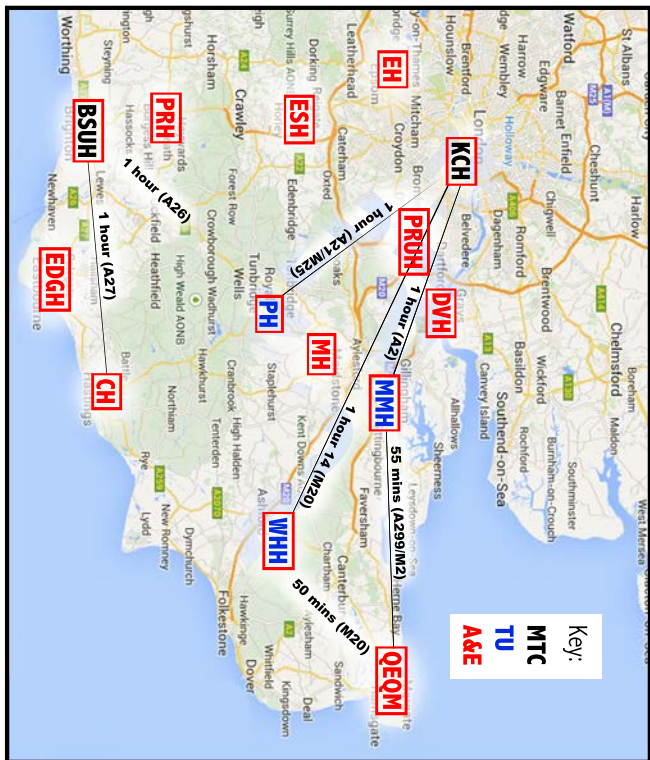
Medscape (2014). www.emedicine.medscape.com



Information

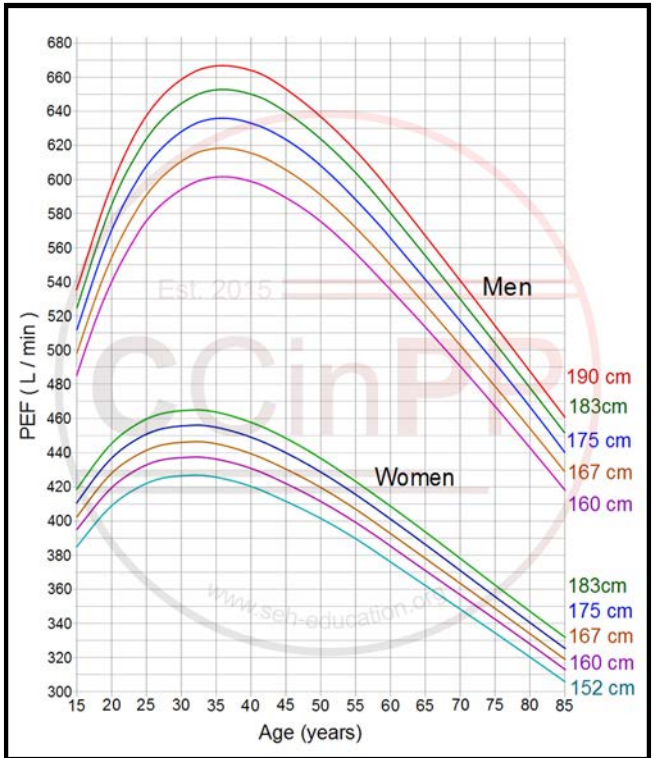


Trauma network



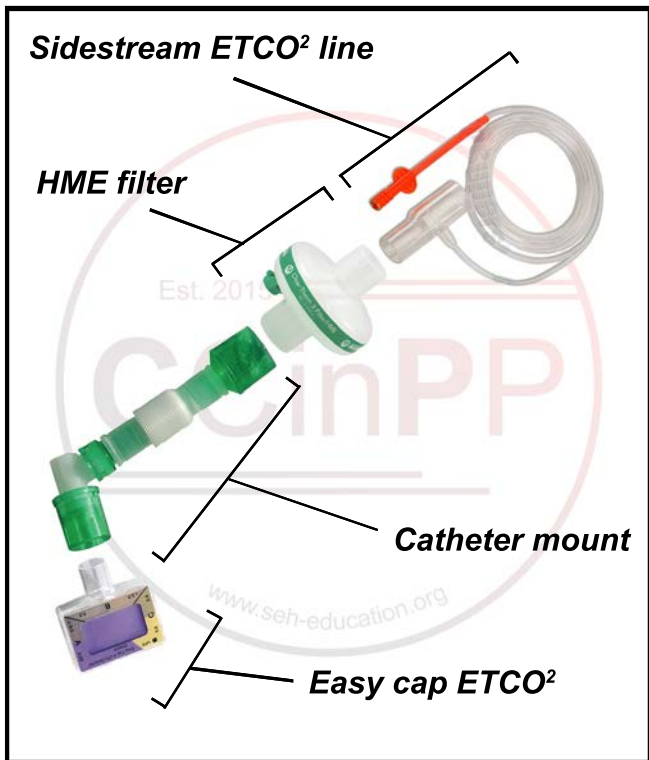
TARN (2014) www.tarn.ac.uk
 Maps (2014) www.google.co.uk

Peak flow (adult)



Wikipedia (2015) *Peak expiratory flow*

Airway circuit



Ear to sternal notch

1. The head is flexed relative to the chest, reproducing the position that patients in respiratory distress use (but supine).
2. Ear to sternal notch positioning maximizes upper airway patency.
3. Ear to sternal notch positioning improves the mechanics of ventilation, both with spontaneous breathing, and with ventilation.
4. In massive obesity this position lengthens the apnoeic time period to critical hypoxia, and shortens the time needed with mask ventilation to return to normal oxygen saturation.
5. Prepare proper ramp, and head and shoulder support for obese patients before transferring onto stretcher and before laryngoscopy attempts. Dynamic lifting during laryngoscopy is impossible in very large patients.



Parapac settings

Below are the **initial** settings for the Parapac 220D ventilator when used in a cardiac arrest

Do not use the Parapac unless trained!

Adult

Relief / Alarm Pressure = 60

CMV/Demand

Frequency = 12

Tidal Volume = 7ml/kg

Paediatric

Relief / Alarm Pressure = initially 0 (max. 30)

CMV/Demand

Frequency = 30

Tidal Volume = 0 (until adequate chest rise)

Operate 'Frequency' and 'Tidal Volume' switches independently to get best mix.

SECAmb Live (2014) Parapac 200D Training Guide

RSI indications

Actual or impending airway compromise

Ventilatory failure

Unconsciousness

Humanitarian reasons

Injured patients who are unmanageable or severely agitated after head injury

Anticipated clinical course

Arterial blood gases

O² >10.6 kPa

CO² 4.7-6.0 kPa

Lactate 0.6-1.8 mmol/L

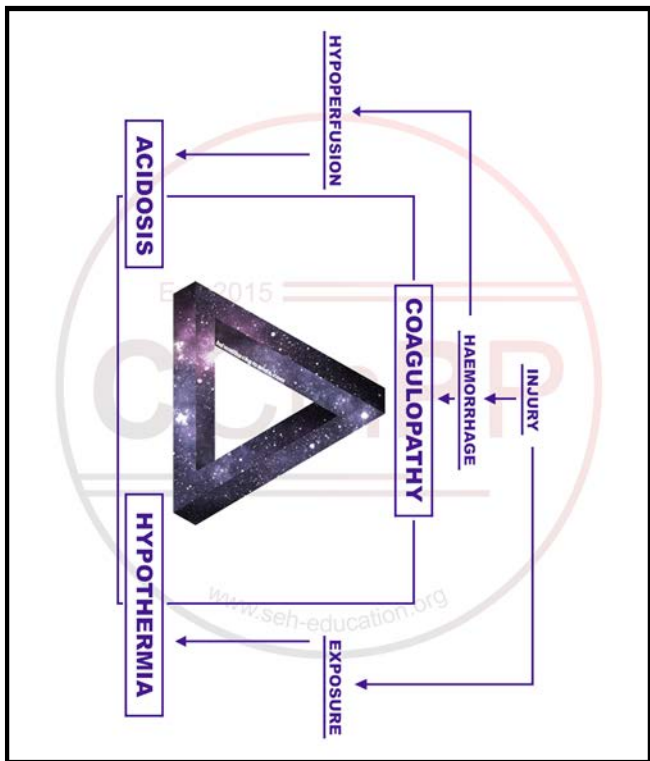
BE ± 2 mmol/L

HCO³ 24-30 mmol/L

Ph 7.35-7.45

Wyatt et al (2012) *Ox. Handbook Emerg. Med.*

Lethal triad



Pelvic fractures

AP compression

May or may not result in bony instability
(depending upon ligamentous disruption)

Lateral compression

Largest proportion of fractures

Internal rotation of the hemi-pelvis

Commonly interrupt **internal iliac artery**

Vertical shear

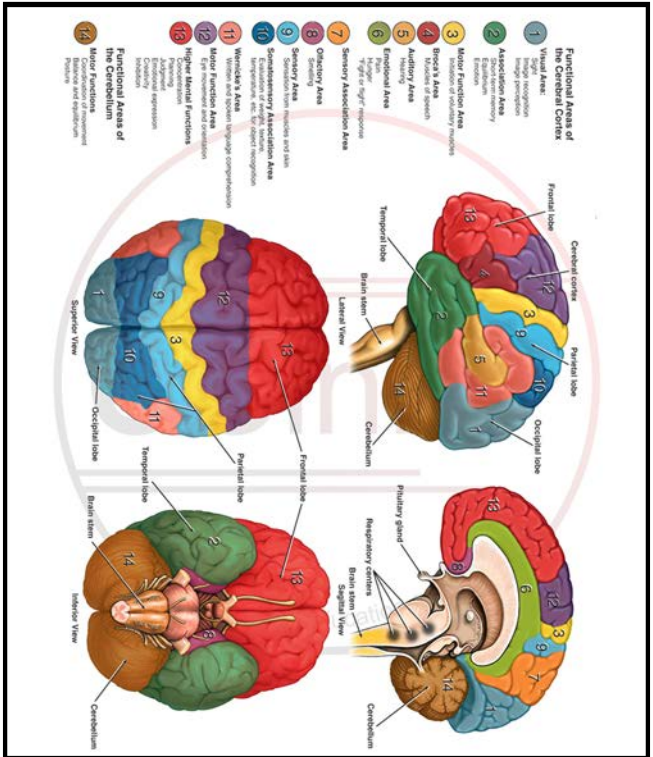
Always very unstable

Commonly (90%) interrupt **sacral
venous plexus**

www.seh-education.org

A. Chesters (2013) *Pelvic Fractures*

Brain areas



6 'P's of limb ischaemia

Pain

Pallor

Pulseless

Perishingly cold

Paraesthesia

Paralysis

Thomas, R., Kings College London, www.fastbleep.com

Ca staging

- (T) Primary tumour**
T1 - T4 = increasing severity
- (N) Regional lymph nodes**
N0 - N3 = increasing nodal disease
- (M) Metastases**
M1 = present; M0 = not present
- (1) Tumour to primary organ**
Operable and resectable
- (2) Local spread and 1st lymph node**
Operable and resectable, high risk
- (3) Extensive primary tumour with deep structure involvement**
? not operable
- (4) Distant metastases**
Not operable

Live cables voltage

Voltage	Minimum distance
750 - 150,000	3 metres
151,000 - 250,000	4.5 metres
>250,000	6 metres

Worsening care advice

Head injury

Rest for 1-2 days

Avoid contact sports for 2 weeks

Take simple painkillers

Children: observe / check regularly

A&E / 999 if:

- * Increasingly severe or persistent headache
- * Restlessness, irritability or abnormal behaviour
- * Abnormal sleepiness or difficulty in awakening the patient
- * Problems with balance
- * Blurred or double vision
- * Repeated vomiting
- * Convulsive movements / FAST signs
- * Decreased level of consciousness

Asthma

Inhalers (+spacer)

Steroids?

GP if:

- * Too breathless to talk, walk or play
- * Blue inhaler (+spacer) ineffective
- * You know asthma is getting worse

A&E / 999 if:

- * Peripheral cyanosis
- * Exhaustion or drowsiness

Febrile

Monitor for:

- * High temperature
- * Flushing and sweating
- * Breath holding
- * Twitching of the face, arms or legs

Manage:

- * Remove clothes
- * Calpol

999 if:

- * Seizure
- * Drowsiness or unconsciousness
- * Parental concern



If you have any suggested
updates or information
you think should be
added, please
email us at:

contact.ccinpp@gmail.com