SECTION THREE – CLINICAL GUIDANCE (ADULTS)

Study this section and use it for reference

ABC – SERIOUSLY ILL ADULTS: SIMPLE OVERVIEW

AIRWAY:

- Assessment: The airway is blocked if:
  the patient is unconscious
  breathing is noisy
  chest is moving but no air entry

  Treatment: Jaw thrust manoeuvre
  Yankeur suction
  Guedel airway, nasopharyngeal airway,
  LMA
  Cuffed endotracheal tube if no gag reflex
  Surgical cricothyroidotomy if above methods fail

BREATHING:

- Assessment: Rate, depth and work. Trachea.

- Treatment: Assist with a bag-valve mask if rate or depth insufficient
  Treat tension pneumothorax*
  Give 100% oxygen by a NRRM

CIRCULATION:

- Assessment: Pulse, capillary refill, respiratory rate, BP

- Treatment: CPR if no major pulse
  Remember the causes of PEA**
  Treat hypovolaemia aggressively with 2 litres fluid initially
  (occult bleeding?- GI bleeding or AAA)
  Remember anaphylaxis as a cause of unexplained shock

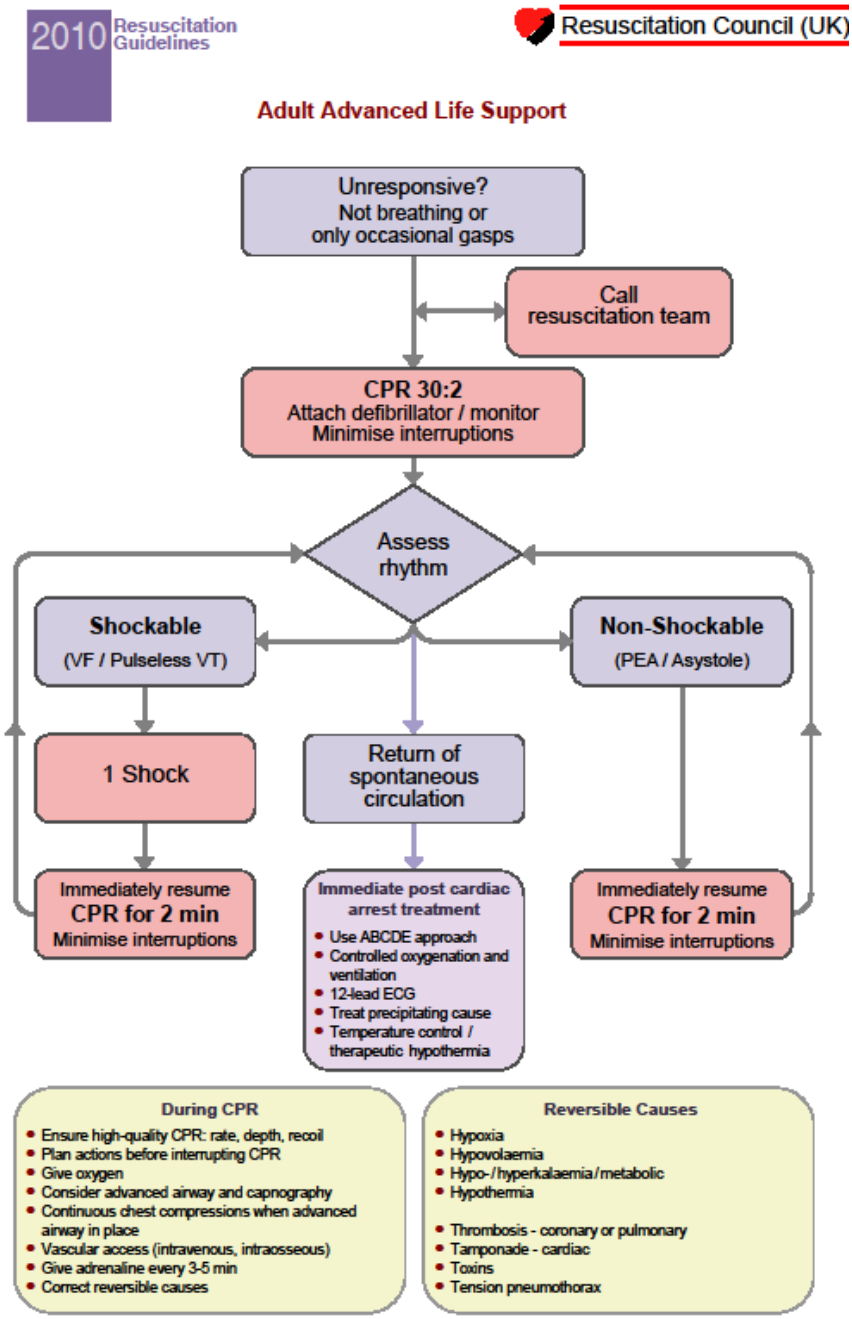
* Tension pneumothorax: Jugular venous distension, trachea deviated, reduced air entry, hyper-resonant to percussion. Release *immediately* by inserting brown venflon into 2nd intercostal space mid clavicular line then arrange for chest drain.

**PEA: Tension pneumothorax, hypovolaemia, drugs, pulmonary embolism, hypothermia, cardiac tamponade, electrolyte disturbance, massive brain injury, cardiac rupture

This department has an **autopulse** machine which provides excellent circulatory support in cardiac arrest where it is felt that the resuscitation will be prolonged. You will be provided with training on this during your induction.

EWS: EARLY RECOGNITION OF A SICK OR DETERIORATING ADULT PATIENT

Sometimes patients can be very sick but superficially look OK to less experienced doctors and nurses. They seem to crash suddenly but in retrospect the signs were there for some time. Early Warning Scores help doctors and nurses to detect relatively subtle signs of decompensation before the patient crashes, greatly increasing their chances of survival. The NEWS score used in Antrim Hospital is based on a province-wide guideline. The related actions are MANDATORY and subject to regular audit.



This department has biphasic defibrillators.

VF or Broad complex tachycardia	-------	150 for all shocks
Narrow complex tachycardia	-------	70 incrementing to 150
Paediatric defibrillation	-------	4 joules/kg

2010 Resuscitation Guidelines

Resuscitation Council (UK)

Adult bradycardia algorithm

- Assess using the ABCDE approach
- Give oxygen if appropriate and obtain IV access
- Monitor ECG, BP, SpO_2, record 12-lead ECG
- Identify and treat reversible causes (e.g. electrolyte abnormalities)

Adverse features?
- Shock
- Syncope
- Myocardial ischaemia
- Heart failure

YES → **Atropine 500 mcg IV** → **Satisfactory response?** YES → NO

NO → **Risk of asystole?**
- Recent asystole
- Mobitz II AV block
- Complete heart block with broad QRS
- Ventricular pause > 3 s

YES → **Interim measures:**
- Atropine 500 mcg IV repeat to maximum of 3 mg
- Isoprenaline 5 mcg min^{-1} IV
- Adrenaline 2-10 mcg min^{-1} IV
- Alternative drugs *

OR
- Transcutaneous pacing

→ **Seek expert help**
Arrange transvenous pacing

NO → **Observe**

*Alternatives include:
- Aminophylline
- Dopamine
- Glucagon (if beta-blocker or calcium channel blocker overdose)
- Glycopyrrolate can be used instead of atropine

October 2010

5th Floor, Tavistock House North, Tavistock Square, London WC1H 9HR
Telephone (020) 7388-4678 • Fax (020) 7383-0773 • Email enquiries@resus.org.uk
www.resus.org.uk • Registered Charity No. 286360

Atrial Fibrillation

If appropriate, give oxygen and establish i.v. access

High Risk?
- Heart rate > 150 beats min^{-1}
- Ongoing chest pain
- Critical perfusion

Yes → Seek expert help

Immediate heparin and synchronised DC shock†
100 J: 200 J: 360 J
or appropriate biphasic energy

Amiodarone 300 mg i.v. over 1 h.
If necessary, may be repeated once

Intermediate Risk?
- Rate 100-150 beats min^{-1}
- Breathlessness
- Poor perfusion

Yes → Seek expert help

Low Risk?
- Heart rate < 100 beats min^{-1}
- Mild or no symptoms
- Good perfusion

Yes → Onset known to be within 24 hours?

No → Consider anticoagulation:
- Heparin
- Warfarin

for later synchronised DC shock†, if indicated

Yes →
- Heparin
- Amiodarone: 300 mg i.v. over 1 h, may be repeated once if necessary

or
- Flecainide 100-150 mg i.v. over 30 mins

and/ or synchronised DC shock†, if indicated

Impaired haemodynamics and /or known structural heart disease?

No → Onset known to be within 24 hours?

No → Initial rate control
- Beta-blockers, oral or i.v.

OR
- Verapamil i.v. (or oral)**

OR
- Diltiazem, oral (or i.v. if available)**

OR
- Digoxin, i.v. or oral

OR

Consider anticoagulation:
- Heparin
- Warfarin

for later synchronised DC shock†, if indicated

Yes → Attempt cardioversion:
- Heparin
- Flecainide 100-150 mg i.v. over 30 mins
- Amiodarone: 300mg i.v. over1 h, may be repeated once if necessary

Synchronised DC shock†, if indicated

Yes → Onset known to be within 24 hours?

No → Initial rate control:
- Amiodarone: 300mg over 1 h, may be repeated once if necessary

Anticoagulation:
- Heparin
- Warfarin

Later, synchronised DC shock†, if indicated

Yes → Attempt cardioversion:
- Heparin
- Synchronised DC shock† 100 J: 200 J: 360 J or equivalent biphasic energy

Amiodarone 300 mg i.v. over 1 h.
If necessary may be repeated once

Doses throughout are based on adult of average body weight

† Note 1: DC shock is always given under sedation/ general anaesthesia.
** Note 2: NOT TO BE USED IN PATIENTS RECEIVING BETA-BLOCKERS

Anaphylaxis algorithm

Anaphylactic reaction?

↓

Airway, Breathing, Circulation, Disability, Exposure

↓

Diagnosis - look for:
- Acute onset of illness
- Life-threatening Airway and/or Breathing and/or Circulation problems [1]
- And usually skin changes

↓

- **Call for help**
- Lie patient flat
- Raise patient's legs

↓

Adrenaline [2]

↓

When skills and equipment available:
- Establish airway
- High flow oxygen
- IV fluid challenge [3]
- Chlorphenamine [4]
- Hydrocortisone [5]

Monitor:
- Pulse oximetry
- ECG
- Blood pressure

---

1 Life-threatening problems:

Airway:	swelling, hoarseness, stridor
Breathing:	rapid breathing, wheeze, fatigue, cyanosis, SpO_2 < 92%, confusion
Circulation:	pale, clammy, low blood pressure, faintness, drowsy/coma

2 Adrenaline *(give IM unless experienced with IV adrenaline)*

IM doses of 1:1000 adrenaline (repeat after 5 min if no better)

• Adult	500 micrograms IM (0.5 mL)
• Child more than 12 years:	500 micrograms IM (0.5 mL)
• Child 6 -12 years:	300 micrograms IM (0.3 mL)
• Child less than 6 years:	150 micrograms IM (0.15 mL)

Adrenaline IV to be given **only by experienced specialists**
Titrate: Adults 50 micrograms; Children 1 microgram/kg

3 IV fluid challenge:

Adult - 500 – 1000 mL
Child - crystalloid 20 mL/kg

Stop IV colloid if this might be the cause of anaphylaxis

	4 Chlorphenamine (IM or slow IV)	5 Hydrocortisone (IM or slow IV)
Adult or child more than 12 years	10 mg	200 mg
Child 6 - 12 years	5 mg	100 mg
Child 6 months to 6 years	2.5 mg	50 mg
Child less than 6 months	250 micrograms/kg	25 mg

SHOCK – INADEQUATE TISSUE PERFUSION

Recognise early
Give oxygen and fluids then find out the cause !

1. Hypovolaemia:
- Early signs are tachycardia, tachypnoea (without increased respiratory effort, delayed capillary refill and poor urinary output
- Hypotension is a late sign
- Apart from trauma, common causes of occult blood loss are ruptured abdominal aneurysm and GI bleeding (do a PR)

2. Cardiogenic:
- Hypoperfusion with jugular venous distension. Abnormal ECG
- Unless you are certain, consider a fluid challenge +/- CVP monitoring prior to inotropes
- Remember tension pneumothorax, cardiac tamponade and massive pulmonary embolism can present this way – exclude by clinical examination and CXR

3. Anaphylactic:
- Possible history of previous anaphylaxis, collapse, potential allergen
- May be upper respiratory tract obstruction as well
- Adrenaline 0.5ml of 1 in 1000 IM repeated if ineffective and IV fluids

4. Neurogenic:
- Overt spinal trauma or unsuspected spine injury (eg. with head injury)
- Hypotension but normal or increased capillary refill time
- Meticulous spinal care, IV fluids in moderation, maintain normal temperature

5. Septic:
- Hypotension, pyrexia, tachypnoea, metabolic acidosis, altered mental status
- IV fluids, broad spectrum IV antibiotics (eg. Tazocin and gentamicin)
- Specific antibiotics for special types of septic shock eg. toxic shock syndrome, meningococcal septicaemia.

Note the surviving sepsis campaign and the following sepsis bundles on the next page. Complete the sepsis proforma.

Involve ITU in any patient with shock not responding to initial treatment

SEPSIS CARE BUNDLES

1. Sepsis Six – To be completed within first hour of recognition of severe sepsis or septic shock

Address simultaneously; target time: (1h from presentation)				Time when task	Initials
1	**100% oxygen**	Give 15L/min via facemask with reservoir bag unless oxygen restriction necessary (e.g. in chronic CO_2 retention aim for an SaO_2 of			
2	**IV fluids**	Give a 500mL - 1000mL bolus of crystalloid (i.e. 0.9% saline or Hartmann's solution) over 30 - 60min. In patients with an initial systolic BP <90 or a lactate >4, give a larger (20mL/kg) bolus. Involve your middle grade doctor or consultant if further fluid resuscitation is required. Give additional boluses of 250-500mL if			
3	**Blood cultures**	Take a minimum 2 sets, including at least one from a fresh venepuncture. Also send sputum culture / wound swabs etc. as			
4	**IV antibiotics**	Ensure cultures have been taken first. Prescribe in full compliance with local antimicrobial guidelines; contact microbiologist if in doubt. Document target time ('to be given by'-time) in drug chart and inform	Prescribed by		
			Given by		
5	**Lactate, Hb & other blood tests**	Lactate requires blood gas analysis (venous sample is acceptable; ensure sample is sent on ice if delay to analysis anticipated). Also request FBC, U&E, LFT, clotting (INR and APTT) and glucose.			
		Repeat lactate after first-hour care duties have been completed.			
		Arrange transfusion if required (target Hb =7).	Prescribed		
		ρ Not required, as Hb >7	Given by		
6	**Catheter**	Dip CSU; send for C&S as appropriate. Monitor urine output hourly.			
Discuss further management plan with your middle grade doctor or					

2. Resuscitation Bundle – to be completed within four hours of recognition of severe sepsis or septic shock

Initial tasks		Time when	Initials
Fluid	Check that patient has received an initial 20mL/kg bolus of		
ITU assessment	Arrange urgent review by ITU team.		
CVP line	Insert urgently under US guidance and in an appropriate environment (e.g. resuscitation or procedure room / theatre). Seek help from your seniors or ITU team if you do not yet have the		
HDU / ITU care	Ensure a bed of the appropriate care level is allocated to patient.		
Goals to be achieved by: (4h from presentation / breach time)		Time task initiated	Initials
Source control	Remove any infected urinary catheter or other indwelling device; arrange for abscess drainage / laparotomy etc. as needed.		
CVP 8-12mmHg	Give 500 - 1000mL IV bolus of crystalloid every 30min until goal achieved.		
MAP 65mmHg	Patients needs Noradrenaline if MAP <65 despite adequate CVP (unless ITU care is deemed inappropriate and reason has been		
$ScvO_2$ 70%	Take blood gas sample from CVP line at regular intervals to determine central venous oxygen saturation ($ScvO_2$). Patient needs Dobutamine (in ITU) if goal not achieved despite Hb >7 and		
Discuss further management plan with your middle grade doctor or			

ABDOMINAL AORTIC ANEURYSM

Patients with a leaking aneurysm are bleeding to death

Suspect leaking aneurysm if:

- Over 55 AND
- Severe Abdominal Pain/'Renal Colic' (haematuria is common)/ Low Back Pain OR
- Unexplained Shock OR
- Known AAA and pain or shock

🡻

Patient is examined by the most senior doctor in the ED IMMEDIATELY +/- USS if competent

If AAA still suspected:

- Contact vascular reg in RVH via #6124
- Patient to be transferred by emergency ambulance ("blue light") to RVH for vascular assessment.
- ECG and IV access
- Do not do CT AAA - this is an unnecessary delay to definitive treatment

🡻

- Usually no doctor is required to accompany patient – surgical doctor if necessary
- Give 100% 02
- Give Morphine +/- Metaclopramide in iv aliquots
- Do not give iv fluids unless unconscious or systolic BP > 80 mmHg

Aim for a maximum time in the Emergency Department of 10 minutes.

Target call-to-surgery is 60 minutes