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Emergency

Prompt Cards

If you have any feedback on the Prompt Cards or ideas for new cards, please contact the Emergency Prompt Card Team at UHSussex East:

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Emergency Bleep List

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ED Consultant	DECT phone 64218
ED Shift Leader	DECT phone 62037
Anaesthetics SHO	8235
Anaesthetics SpR	8224
Cardiology SpR	8850
Cardiothoracic SpR	DECT phone 62047
Critical Care Outreach	8495
ENT SHO	8619
ENT SpR	Via switchboard
General Surgery SHO	8614
General Surgery SpR	8613
ITU SpR	8413
Max Fax SHO	8787/Via switchboard
Max Fax SpR	Via switchboard
Medical Consultant	DECT phone 62070
Medical SpR	8521/8986
Medical SHO	8520
Neurosurgery SpR	DECT phone 62032
Orthopaedics SHO	8471
Orthopaedics SpR	8629
Obstetric SpR	8612
Radiographer	8299/4179
Radiographer CT	8800
Radiology SpR	DECT phone 64239
Renal SpR	8031
Vascular Surgery SpR	8004/Via switchboard
CEPOD Co-ordinator	8061
Site Manager	8152
Medical Bed Manager	8284
Surgical Bed Manager	8300

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Emergency

Prompt Cards

Medical Emergencies Section

Suspected Sepsis

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1	**Could this be sepsis?** • NEWS ≥4 AND/OR • Does the patient look sick?
2	**If yes:** • Ensure full set of observations • Complete sepsis screening tool • Get senior review ST4+
3	• Senior doctor review identifies presence of one or more red flag symptoms OR • Suspect sepsis • **Complete sepsis 6 within one hour of diagnosis**
4	**Senior doctor does not suspect sepsis** • Confirm differential diagnosis • Sign off/discontinue sepsis screening tool • Document plan in patient notes
5	**Contact Critical Care Outreach Team** (8495 RSCH / 6331 PRH) if: • Further clinical deterioration/critically unwell at any time • No improvement post administration of treatment after 1 hour • No reduction in lactate • Consider referral to ITU/HDU

RED FLAGS

- Lactate ≥ 2 mmol/L
- Heart rate >130
- Altered mental state (V/P on AVPU)
- Systolic blood pressure <90 mmHg
- Respiratory Rate >25
- Oxygen required to maintain SpO_2 >92% (88% in COPD)
- Urine – not passed in 18 hours or <0.5 mL/kg/hour
- Non blanching rash, mottled, ashen, cyanosed
- Recent chemotherapy (<6weeks)

Sepsis Six

1. Oxygen
2. Blood cultures
3. IV antibiotics - Microguide
4. IV fluids
5. Lactate and bloods
6. Urine output

Hyperkalaemia

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Mild: >5.5 – 5.9 mmol/L	**Moderate**: 6.0 – 6.4 mmol/L	**Severe**: ≥ 6.5 mmol/L

12 lead ECG (continuous monitoring if K ≥ 6.5 mmol/L, or acutely unwell patient) Bloods (U&E, CK, VBG, FBC)

- If K^+ ≥ 6.5, or ECG changes, then start treatment (at Step 1)
- If K^+ 6.0 – 6.4 and no ECG changes, then consider treating (from Step 2)
- If K^+ ≤ 5.9 and no ECG changes, then work-up for cause of hyperkalaemia and manage accordingly (Step 5)

Step 1 **Protect the heart**	IV Calcium 30 mL 10% calcium gluconate Or 10 mL 10% calcium chloride
Step 2 **Move K^+ into cells**	IV Insulin + Dextrose 50 mL of 50% dextrose plus 10 units of Actrapid Insulin, over 15 minutes *Then* 50 mL/hr of 10% dexrose for 5 hours, if blood glucose ≤7.0 mmol/L prior to treatment *Consider* nebulised Salbutamol 10 – 20 mg
Step 3 **Monitor response to therapy**	Close and regular watch on blood glucose and K^+
Step 4 **Remove K^+ from the body**	Treat Acute Kidney Injury Sodium Zirconium Cyclosilicate (Lokelma™) 10 g PO TDS for up to 72 hours Renal replacement therapy – likely to be required for refractory or severe hyperkalaemia in AKI or CKD Bleeps: Renal SpR 8031 ITU SpR 8413 (RSCH) 6010 (PRH)
Step 5 **Act to treat underlying cause**	Look for causes Adjust medications – consider Sodium Zirconium Cyclosilicate (Lokelma™) for patients with Heart failure or CKD 3b-5 *and* who cannot control K^+ without stopping Renin-Angiotensin-Aldosterone-System inhibitors
CARDIAC ARREST	IV Calcium chloride 10% 10 mL; repeat if no better after 5 minutes IV insulin + dextrose (50 mL of 50% Dextrose + 10 units Actrapid) IV bicarbonate (50 mL of 8.4% $NaHCO_3$) Plan for emergent renal replacement therapy (with CPR ongoing) in suitable patients if ROSC not achieved SEEK URGENT SENIOR SPECIALIST ADVICE

Glucose	**Baseline**	**15 mins**	**30 mins**	**1 hour**	**90 mins**	**2 hours**	**3 hours**	**4 hours**	**6 hours**	**8 hours**	**12 hours**	
Potassium	Baseline			1 hour		2 hours		4 hours	6 hours			24 hours

MASSIVE Pulmonary Embolus (PE)

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1	Unstable patient with likely PE diagnosis/proven massive PE (BP <90 systolic, PaO_2 <7) • Exclude other causes for shock (sepsis, cardiac arrhythmia or hypovolemia, tension pneumothorax or cardiac tamponade)
2	Does the patient require urgent treatment before imaging? • Significant haemodynamic instability is a contraindication to CTPA • Arrange a bedside ECHO OR • Consider thrombolysis based on clinical picture – Senior clinical decision • **Once decision has been made to thrombolyse administer within 5 minutes**
3	**Thrombolysis in Arrest/Peri arrest** • Is it appropriate to continue CPR for 60 minutes? • Give ALTEPLASE 50 mg IV bolus • If no return of spontaneous circulation or improvement after 15 minutes • Give ALTEPLASE 50 mg IV bolus • MAX 100 mg ALTEPLASE
5	**Thrombolysis In Stable Patient** • ALTEPLASE 10 mg IV over 1-2 minutes • Then prepare an infusion of 90 mg over 2 hours (if <65 kg then give 1.5 mg/kg)
6	Start Heparin Infusion after 3 hours • Once APTT ratio <2 OR ROSC and APTT ratio <2 • Administer as per Trust IV Heparin protocol
7	Is thrombectomy an option? If so, contact cardiology (#8850) +/- interventional radiology (switch)

Diabetic Ketoacidosis Management in Adults

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Diagnostic criteria – all 3 required:
- Blood ketones >3 mmol/L
- Blood glucose >11 mmol/L or known diabetes (T1 and 2)
- Serum bicarbonate <15 mmol/L AND/OR venous pH <7.3

1	ABCDE assessment – assess severity
2	Prescribe IV fluids • 1 L 0.9% sodium chloride over 1 hour
3	Prescribe IV fixed rate insulin infusion • 50 units of ACTRAPID in 49.5 mL 0.9% sodium chloride • Rate of 0.1 units/kg bodyweight/hour
4	Continue long-acting insulin at normal dose • Lantus (Glargine), Levemir (Detemir), Tresiba, Abasaglar
5	Identify and treat causes • Infection • High HbA1c – check HbA1c on admission • Illicit drug/excessive alcohol use • High/prolonged levels of stress
6	Monitoring • Hourly blood glucose and ketones • 2 hourly VBG to check pH, potassium and bicarbonate

Fluids

1 L 0.9% sodium chloride with potassium as per below box
- 1 L over next 2 hours
- 1 L over next 2 hours
- 1 L over next 4 hours
- 1 L over next 4 hours
- 1 L over next 6 hours

Start 10% dextrose at rate of 125 mL/h when blood sugar <14 mmol/L

Potassium replacement per 1 L fluid
- **K^+ >5.5:** Nil
- **K^+ 4.5-5.5:** 20 mmol
- **K^+ 3.5-4.5:** 40 mmol
- **K^+ <3.5:** contact senior

Consider ITU/HDU review if:
- Blood ketones >6 mmol/L
- Serum bicarbonate <5 mmol/L
- Serum pH <7.1
- Serum K^+ <3.5 mmol/L on admission
- GCS <12
- SpO_2 <92% on air (if normal respiratory function)
- Systolic BP <90 mmHg
- Pulse >100 bpm or <60 bpm
- Anion gap >16

Hypoglycaemia Management in Adults

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Definition:
Capillary blood glucose (CBG) <4.0 mmol/L

Is the patient conscious and can they swallow?

Yes

Give quick-acting carbohydrate

- Recheck CBG in 10-15 minutes
- If CBG not increased to >4.0 mmol/L , repeat quick-acting carbohydrate
- If still hypo after 3 doses, consider treating as per unconscious patient
- If symptoms improve and CBG has increased, give long-acting carbohydrate

No

- IV access → give 150 mL 10% glucose IV
- No IV access → give 1 mg glucagon IM*

- Recheck CBG in 10-15 minutes
- If CBG not increased to >4.0 mmol/L, repeat above step
- As patient improves and sufficiently awake to swallow, give long-acting carbohydrate

Quick-acting carbohydrate:
- 5 teaspoons glucose power in water **OR**
- 2 cuplets apple juice **OR**
- Glucose tablets (give number of tablets equivalent to 20 g carbohydrate)

Long-acting carbohydrate:
- Slice of bread
- 1 glass milk + 1 biscuit
- Main meal if due

***Glucagon will be ineffective in starved patients or those with liver disease. IV glucose is the treatment in these cases.**

Following a hypoglycaemic episode:
- Once fully orientated and CBG is staying >5.0 mmol/L, return to previous regularity of BM monitoring
- Be aware that the patient may be susceptible to further episodes of hypoglycaemia
- If the episode is treated successfully <u>give the next dose insulin / diabetes medication as normal</u>
- If recurrent episodes of hypoglycaemia, refer to diabetes team or diabetes CNS
- Any patient with diabetic foot ulcer (admitted or discharged from ED) should have podiatry referral (form on Bamboo)

Life-Threatening Asthma

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1 ABCDE assessment – Urgent senior ED and urgent ITU review if life threatening features

2 Life threatening asthma is severe asthma with any one feature of life threatening:

Severe Asthma (any 1 of)	Life Threatening Clinical Signs	Life Threatening Measurement
• PEF 33-50% best/predicted	• Altered conscious level	• PEF <33% best/predicted
• RR ≥25/min	• Exhaustion	• SpO_2 <92%
• HR ≥110/min	• Arrhythmia	• PaO_2 <8 kPa
• Inability to complete sentences in one breath	• Hypotension	• 'normal' $PaCO_2$ (4.6-6 kPa)
	• Cyanosis	
	• Silent chest	
	• Poor respiratory effort	

3 **Immediate management:**

- Oxygen (maintain SpO_2 94-98%)
- Salbutamol 5 mg nebulised continuous
- Ipratropium 0.5 mg nebulised 4-6 hourly
- Prednisolone 40-50 mg PO / hydrocortisone 100 mg IV

4 Perform ABG if SpO_2 ≤92% or life-threatening features to look for markers of severity (acidosis, ↑CO_2, ↓O_2)

5 No improvement? Get senior review and consider:

- 2 g IV magnesium sulphate over 20 minutes

6 Order portable CXR

7 In acute severe/life-threatening asthma not responding to the above treatment consider referral to ITU

ACS / Acute Chest Pain Pathway

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	On arrival in A&E
1	12 lead ECG
2	IV access
3	Baseline observations
4	Continuous cardiac monitoring until 1st troponin result
5	Blood tests (FBC, U&Es, LFTs, troponin, INR, lipids, glucose)
6	Medical clerking and drug chart to be completed in A&E
7	Initiation of ACS treatment when diagnosis confirmed
8	Medical assessment confirms **Cardiac** chest pain (SpR or above)
9	Follow pathway on next page

ACS / Acute Chest Pain Pathway

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Adult Acute Suspected Cardiac Chest Pain ?ACS

Write in Capitals or affix patient ID sticker

Patient Name : _____

Patient Hospital Number : _____

- On arrival in ED
- 12 lead ECG , Repeat if symptoms
- Baseline observations
- IV access, continuous ECG monitoring, Chest XRay
- Blood Tests - Cardiac profile
- Consider non ACS diagnosis e.g. PE/pneumothorax/aortic dissection

	Time Taken		Calculations
Onset of Chest Pain Time: ____:____			
T0 is Presentation Troponin Time: ____:____	____:____	☐ T0 Result: _____	T0-T1 Δ _____
T1 is One hour from Presentation Time : ____:____	____:____	☐ T1 Result: _____	T1-T3 Δ _____
T3 is Three hours from Presentation Time: ____:____	____:____	☐ T3 Result: _____	(T1-T3 Δ) ÷ T1 x100=_____%

Δ is the change between two values e.g. if T0 is 6 , T1 is 12 the T0-T1 Δ is 6. And if T3 is 21 the T1-3 Δ is 9 = 75% rise (9/12 x100)
Always double check time between lab values is valid.

ST Elevation → Yes → Activate STEMI PPCI Pathway

No - Require T0 + T1

Move to resus if high risk ECG or abnormal observations. If clinically unstable/ongoing ischaemic chest pain contact Cardiology SpR**

If Painfree, obs stable and non ischaemic ECG

Risk Stratify

- ☐ Rapid increase in previously stable angina.
- ☐ New onset exertional pain resulting in reduced exercise tolerance BUT no rest or prolonged pain.
- ☐ Pain lasting >15mins.
- ☐ Pain increasing in frequency over short period/rest pain.
- ☐ Cardiac history with pain similar to previous MI/angina.
- ☐ Pain associated with nausea/sob/sweating.

Risk Score : Low risk=0 Medium=1-2 High risk=3+ Discuss with ED Senior

Unstable angina is defined by a normal troponin

ACS / Acute Chest Pain Pathway

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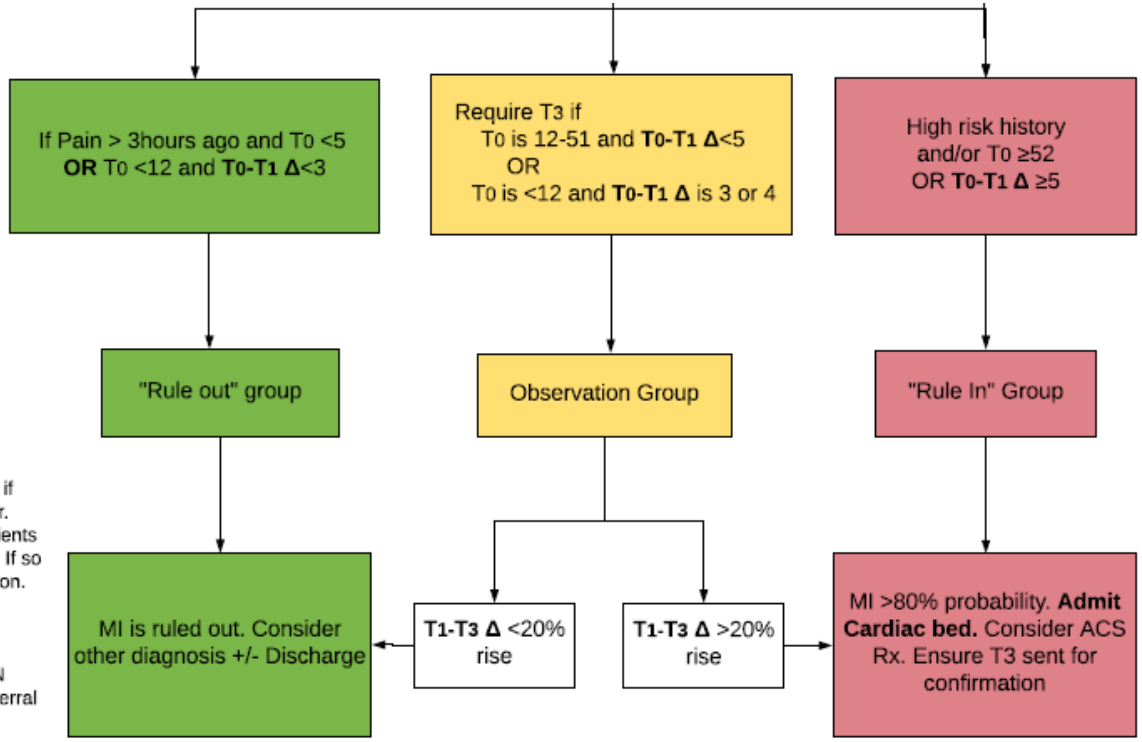

Discharge
Give appropriate advice if symptoms were to recur.
The RACPC is only for patients where angina is suspected. If so start appropriate medication.
Aspirin 75mg od
Bisoprolol/anti-anginal
Atorvastatin 40mg od
GTN spray 2puffs PRN
Complete online Panda referral form for RACPC

****Clinically unstable transfer to CCU RSCH**
- Transient ST elevation, persistent ST depression
- Acute chest pain with pulmonary oedema
- Haemodynamic compromise BP <90mmHg /new MR /LVF
- Sustained VT/CHB

Direct Transfer from ED to cardiac bed RSCH
0800-2200 notify Cardiology Spr on call 62045
2200-0800 notify Medical reg on call
9-5pm liase with cardiac bed manager bleep 8357
Out of hours liase with site manager

Contraindications to direct transfer to cardiac bed (discuss with cardiology SPR first)
- Frailty ?conservative management
- Patients undergoing palliative care
- Acute confusional state
- Intercurrent sepsis

Pathways of care are designed to help, not to override clinical decision making.
If there is a good clinical reason to follow an alternative course of action, then it should be done with expert input as necessary.
Serial cardiac troponin testing should be pursued if the clinical suspicion remains high or whenever the patient develops recurrent chest pain.

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STEMI for PPCI Treatment Guidance in ED

From arrival in ED to PPCI in Cath Lab, this guidance contains initial therapeutic management of STEMI before PPCI. This includes the recommended choice and dosage of dual-antiplatelets therapy, VTE prophylaxis and analgesics. If Primary angioplasty is not available/feasible, please discuss with Cardiology SpR/Consultant for consideration of Thrombolysis.

Avoid delay in transfer to Cath Lab

Contact SpR
08:00-21:00 Cardio SpR bleep 8850
21:00-08:00 Med Reg bleep 8986
(RSCH CCU ext. 4484/4903/4033)

Upon patient arrival	1. Trigger PPCI pathway for transfer to Cath Lab by contacting CCU on 01273 523099. 2. Check the treatment given by paramedics before arrival 3. Clarify with the patient any drug allergies and any antiplatelet use in the last 24 hours
Start loading regime	Give ***Aspirin*** 300 mg PO with ***Clopidogrel*** 600 mg PO (or ***Ticagrelor**** 180 mg PO) *Ticagrelor is contraindicated in patients with active bleeding or history of intracranial haemorrhage. Please avoid in patients taking anticoagulant, or with PMHx of CVA/TIA/moderate-severe liver disease. Give aspirin and clopidogrel if already on anticoagulation.
PPCI Primary Angioplasty	Transfer to Cath Lab for PPCI. If this is not available/feasible, discuss with Cardiology SpR or Consultant for the option of Thrombolysis. More at Thrombolysis Cardiology Pathway
Conduct VTE risk assessment	If the patient is on anticoagulation, consider holding it before PPCI. Otherwise, VTE prophylaxis on the next day after PPCI is ***Enoxaparin*** (or ***Unfractionated Heparin*** if CrCl <20 mL/min)
Hyperglycaemia	If admission blood glucose is ≥ 10.0 mmol/l, prescribe as per Hyperglycaemia Microguide: ***Insulin Sliding Scale*** + IV Fluids at 30 mL/hour + PRN Hypoglycaemic Treatment

PRN

Morphine IV 2.5-10 mg, Max freq. 3-4 hourly give at 1 mg/min
Metoclopramide IV/IM/PO 10-20 mg, Max freq. 4 hourly
Glyceryl Trinitrate Spray* SL 400-800 micrograms, PRN
Glyceryl Trinitrate Injection* IV 15-150 micrograms/min
** ensure no contraindications for GTN before prescription, e.g. bradycardia, hypotension, aortic/mitral stenosis
Paracetamol PO 500-1000mg, Max freq. 4-6 hourly, Max dose 4 g in 24 hours

Please note: This guidance is designed to help and not intended to override clinical decision-making. In any circumstances or unsure of indication for commencing treatment/the choice of medication, then it should be discussed with experts for input as necessary.

REFERENCE: BNF, NICE, ESC
https://bnf.nice.org.uk/treatment-summary/acute-coronary-syndromes.html
https://www.nice.org.uk/guidance/ng185
https://www.escardio.org/Guidelines/Clinical-Practice-Guidelines/Acute-Myocardial-Infarction-in-patients-presenting-with-ST-segment-elevation-Ma
Last updated: April 2021 Review due: April 2022 Version 1.0, Authors: Tsz Lee Tse, Tom De'Ath, Michael Michail

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Non-ST Elevation ACS Treatment Guidance in ED

This guidance contains the initial therapeutic management of unstable angina and NSTEMI in A&E and the indications for early coronary angiogram in high-risk non-ST Elevation Acute Coronary Syndrome. It also includes the recommended choice and dosage of dual-antiplatelets therapy, VTE prophylaxis and analgesics.

Consider resus/transfer to CCU if:
- Haemodynamically compromised
- Pulmonary oedema
- Sustained VT/CHB
- Persistent ST depression

Contact SpR
08:00-21:00 Cardio SpR bleep 8850
21:00-08:00 Med Reg bleep 8986
(RSCH CCU ext. 4484/4903/4033)

Diagnosis of NSTEMI/ Unstable Angina

1. Check the treatment given by paramedics before arrival
2. Clarify with the patient any drug allergies and any antiplatelet use in the last 24 hours

Start loading regime

Give ***Aspirin*** 300 mg PO with ***Clopidogrel*** 600 mg PO (or ***Ticagrelor**** 180 mg PO)

*Ticagrelor is contraindicated in patients with active bleeding or history of intracranial haemorrhage. Please avoid in patients taking anticoagulant, or with PMHx of CVA/TIA/moderate-severe liver disease. Give aspirin and clopidogrel if already on anticoagulation.

Discuss for early coronary angiogram

For patient presenting with high-risk features:
Ongoing chest pain / dynamic ECG changes / anterior T wave inversion, discuss with Cardio SpR for early coronary angiogram

Conduct VTE risk assessment

If the patient is taking anticoagulation, continue their current regime. Otherwise, VTE prophylaxis before coronary angiogram is ***Fondaparinux 2.5mg Once Daily*** (or ***Unfractionated Heparin*** if CrCl <20 mL/min or if high bleeding risk)

Hyperglycaemia

If admission blood glucose is ≥10.0 mmol/l and positive troponin, prescribe as per Hyperglycaemia Microguide: ***Insulin Sliding Scale*** + IV Fluids at 30 mL/hour + PRN Hypoglycaemic Treatment

PRN

Morphine IV 2.5-10 mg, Max freq. 3-4 hourly give at 1 mg/min ***Metoclopramide*** IV/IM/PO 10-20 mg, Max freq. 4 hourly
Glyceryl Trinitrate Spray* SL 400-800 micrograms, PRN
Glyceryl Trinitrate Injection* IV 15-150 micrograms/min
** ensure no contraindications for GTN before prescription, e.g. bradycardia, hypotension, aortic/mitral stenosis
Paracetamol PO 500-1000 mg, Max freq. 4-6 hourly, Max dose 4 g in 24 hours

Consider other conditions associated with positive troponin:

- Aortic Dissection
- Heart Failure
- Tachyarrhythmias,
- Valvular Heart Disease
- Myocarditis / Takotsubo Syndrome
- Critical Illness (e.g. Sepsis/Shock/Burns)
- Hypertensive Emergencies
- Pulmonary Embolism, Pulmonary Hypertension
- Renal Dysfunction and associated cardiac disease
- Acute Neurological Event (e.g. Stroke/Subarachnoid Haemorrhage)

Please note: This guidance is designed to help and not intended to override clinical decision-making. In any circumstances or unsure of indication for commencing treatment/the choice of medication, then it should be discussed with experts for input as necessary.

REFERENCE: BNF, NICE, ESC, EMC
https://bnf.nice.org.uk/treatment-summary/acute-coronary-syndromes.html
https://pathways.nice.org.uk/pathways/chest-pain#path=view%3A/pathways/chest-pain/assessment-and-immediate-management-of-suspected-acute-coronary-syndrome.xml&content=view-node%3Anodes-initial-assessment
https://www.escardio.org/Guidelines/Clinical-Practice-Guidelines/Acute-Coronary-Syndromes-ACS-in-patients-presenting-without-persistent-ST-segm
https://www.medicines.org.uk/emc/product/3335/smpc

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Version 1.0, Authors: Tsz Lee Tse, Tom De'Ath, Michael Michail

Unexplained Hypotension – Diagnostic Prompt

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INITIAL MANAGEMENT

1	ABCDE assessment
2	Ensure large bore IV access
3	Send VBG
4	Request portable CXR
5	Do an ECG
6	Start IV fluids unless contraindicated
7	Inform senior

THINK and consider following diagnoses

Could this be CARDIAC TAMPONADE?
→ Examine and ultrasound

Could this be TENSION PNEUMOTHORAX?
→ Examine and ultrasound
→ If peri-arrest consider bilateral thoracotomies

Could this be a RUPTURED AORTA/INTRA-ABDOMINAL BLEED?
→ Perform a FAST Scan
→ Measure aorta (>4.5 cm consider AAA and CT)
→ If any concerns contact Vascular SpR bleep 8004, OOH via switchboard

Could this be RETROPERITONEAL BLEEDING?
→ Examine and ultrasound

Could this be PULMONARY EMBOLISM?
→ See massive PE prompt card

Treatment of Convulsive Status Epilepticus in Adults

(16 years and over)

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Status Epilepticus (SE); a <u>life-threatening</u> medical emergency, defined as tonic-clonic seizures

- ☐ lasting ≥ 5 minutes
- ☐ 2 or more seizures without return to consciousness
- ☐ 3 or more tonic-clonic seizures within a 1-hour timeframe

Manage hypoglycaemia:

Give 150-200mL 10% glucose IV stat

If blood-glucose remains <4mmol/L commence 10% glucose infusion at 100mL/hour

If suspected alcohol excess or malnutrition, give 1 pair Pabrinex IV

<u>Initial management</u>

- ☐ Maintain airway, resuscitate and administer oxygen
- ☐ Assess cardio-respiratory function
- ☐ Institute regular monitoring:
  - Neurological observations + BP, T, HR, SaO_2, **<u>BMs</u>**
- ☐ Establish IV access in <u>largest</u> vein possible
- ☐ **<u>Start treatment without delay – most common causes of treatment failure are underdosing and delays to treatment initiation</u>**

5 MIN

<u>5-10 minutes: Initial treatment</u>

<u>Action:</u> <u>Start benzodiazepine treatment ASAP – DO NOT DELAY

<u>If patient has reduced respiratory rate, is hypoxic or cyanosed call MET team (#2222) immediately</u>

<u>IV access</u>

Lorazepam 4mg IV bolus

2mg STAT + 2mg PRN may be appropriate in frailty and renal impairment on advice of consultant

Monitor and give 2nd dose after 10 minutes if seizures continue

<u>IV access – Lorazepam shortage</u>

Diazepam 10mg slow IV injection

Maximum rate of injection 1mL (5mg) per minute Diazepam IV is available as solution and emulsion – dose and rate of injection are equivalent*

Monitor and give 2nd dose after 5 minutes if seizures continue

<u>No IV access</u>

Diazepam 10mg PR, **or**
Midazolam 10mg buccal, **or**
Midazolam 10mg IM (ITU only)

Monitor and give 2nd dose after 10 minutes if seizures continue

- ☐ Consider whether any pre-admission benzodiazepines have been given (if seizure occurred out of hospital)

10 MIN

Investigations (after IV meds started:

- ABG
- ECG
- FBC, U&E
- LFTs
- Ca^{2+}, Mg^{2+}
- Clotting screen
- Anti-epileptic drug serum levels

<u>10-30 minutes: Established status epilepticus – risk of long-term brain damage</u>

<u>Action:</u> <u>Call MET team (2222) - Start emergency IV anti-epileptic drug (AED) therapy ASAP

Both sodium valproate and levetiracetam are unlicensed, but are non-inferior in terms of efficacy and safety compared to phenytoin, and have practical advantages. **For further guidance regarding drug choice, see table overleaf**.

- ☐ **Treatment options:**
  - Levetiracetam 60mg/kg IV infusion (max 4500mg)
  - Sodium valproate 40mg/kg IV infusion (max 3000mg)
  - Phenytoin 20mg/kg IV infusion (max 2000mg)
- ☐ **Inform anaesthetist/request airway support if patient is still in Status Epilepticus after 50% of infusion has been administered**

30 MIN

<u>30 minutes onwards:</u>

<u>If seizure resolves:</u>

Actions checklist:

- ☐ **Reinstate existing anti-epileptic medication (via PO/IV/NG route)**
  - Ward/on-call pharmacist or on-call neurologist can advise if alternative formulations or route of administration is required
- ☐ Monitor neurological observations and GCS every 30 minutes and if patient does not regain consciousness within 1-2 hours, call for senior help
  - Continue neurological observations 4-hourly for the next 12 hours
- ☐ Establish aetiology, identify and treat medical complications

<u>If seizure continues:</u>

Transfer to HDU/ ITU

IMPLEMENTED OCT 2021 VERSION 6.0 REVIEW DUE OCT 2023

Choice of IV anti-epileptic drug therapy guidance

Drug	Dose and administration	Preferred if:	Avoid if:
Levetiracetam	Dose: 60mg/kg Max dose: 4500mg* Max rate: 6mg/kg/min Preparation: Dilute required dose in at least 100mL sodium chloride 0.9%	Polypharmacy – no drug:drug interactions Hepatic impairment	Confirmed history of severe mood or behavioural disorder *Maximum dose reduced in renal impairment: □ CrCl 50-79mL/min - max dose 2000mg □ CrCl 30-49mL/min – max dose 1500mg □ CrCl <30mL/min – max dose 1000mg
Sodium Valproate	Dose: 40mg/kg Max dose: 3000mg Max rate: 10mg/kg/min Preparation: Dilute required dose in at least 50mL of sodium chloride 0.9% or glucose 5%	Known/suspected idiopathic generalised epilepsy syndrome History of severe mood or behavioural disorder	**Women of childbearing potential (sodium valproate is highly teratogenic) – seek immediate senior help and/or contact neurologist on-call for advice if levetiracetam and phenytoin are also contra-indicated** Liver disease or pancreatitis is present Known or suspected metabolic/mitochondrial disorders Consider potential for drug interactions (CYP-enzyme inhibitor)
Phenytoin	Dose: 20mg/kg Max dose: 2000mg Max rate: 1mg/kg/min up to a max of 50mg/min Preparation: Dilute in sodium chloride 0.9% to a concentration of 5-10mg/mL	Previous response to treatment with phenytoin for status epilepticus	Co-morbid cardiovascular disease – cardiac monitoring required Hypotension/bradycardia/heart block Known/suspected idiopathic generalised epilepsy syndrome Known or suspected recreational drug overdose or alcohol withdrawal seizures are present No access to large vein (extravasation risk and potential for severe tissue injury) High risk for drug interactions (CYP-enzyme inducer)
Lacosamide	Dose: 200-400mg Max dose: 400mg* Max rate: 200mg over 15-30 minutes, 400mg over 30-60 minutes Preparation: May be administered undiluted or diluted in any suitable volume of sodium chloride 0.9% or glucose 5%.	May only be considered on the advice of a neurologist if all other options are unsuitable	Known 2nd/3rd-degree atrioventricular block Caution in severe cardiac disease or history of arrhythmias No access to large vein/central line
Phenobarbital	Dose: 10mg/kg Max dose: 1g Max rate: 100mg/minute Preparation: Dilute each 1mL to 10mL with sodium chloride 0.9% or glucose 5%	May only be considered on the advice of the critical care team in cases of suspected drug overdose	Acute intermittent porphyria Severe renal or hepatic impairment Severe respiratory depression High risk for drug interactions (CYP-enzyme inducer) No access to large vein/central line

Neurology SpR / consultant on-call can be contacted through PRH switchboard (01444 441881).

Detailed clinical information for the diagnosis and management of Status Epilepticus can be found via BMJ best practice (https://bestpractice.bmj.com/topics/en-gb/3000127)

Adult Convulsive Status Epilepticus Guideline, May 2021. Updated by Dr Julia Aram, Epilepsy Lead and Neurology pharmacists Mr Matthew Seymour and Mrs Gill Yates

Adrenal Insufficiency / Addisonian Crisis Emergency Management

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Patients at Risk

- Pre-existing Addison's disease (primary adrenal insufficiency)
- Pituitary disease (secondary adrenal insufficiency)
- Patients on chronic steroid treatment: ≥5 mg prednisolone daily (or equivalent dose of other steroids) for ≥4 weeks in the last 3 months OR ≥ 40 mg prednisolone daily for >1 week in the last 3 months
- Patients on immunotherapy with checkpoint inhibitors

Precipitants:

- Infection
- Dehydration
- Diarrhoea
- Vomiting
- Major stress
- Trauma

Diagnostic measures should not delay treatment. If Addisonian crisis suspected, treatment should commence without delay

Closely monitor for biochemical abnormalities

- Hyponatraemia
- Hyperkalemia (not in pituitary patients)
- Hypoglycaemia

MAY BE NONE IF CAUGHT EARLY

Immediate Management

→ Hydrocortisone 100 mg IV/IM STAT (continue 50 mg QDS regularly)
→ IV fluids: 1 L 0.9% NaCl in the first hour
→ Further IV hydration (several litres may be required over 24 hours)
Monitor for fluid overload in elderly, cardiac and renal impairment
→ Monitor capillary blood glucose and treat hypoglycemia

Clinical Features

- Hypotension
- Dizziness
- Collapse
- Hypovolemic shock
- Fatigue
- Confusion
- Delirium
- Impaired level of consciousness
- Abdominal pain/cramps
- Nausea/vomiting
- Weight loss

There are no adverse consequences of initiating life-saving hydrocortisone treatment.

If the diagnosis is unclear, it can be safely and formally established when the patient has clinically recovered.

Seek urgent endocrine advice for patients on DDAVP (desmopressin)

Report all incidents of Addisonian crisis for patients with known adrenal insufficiency or hypopituitarism on the DATIX system

Atrial Fibrillation

Cardio SpR: Bleep 8850

NHS University Hospitals Sussex NHS Foundation Trust

Assess as per ALS guidelines for tachycardia

- ABCDE approach
- Give O_2 if appropriate and obtain IV access
- Monitor BP, SpO_2 and connect to cardiac monitor
- Identify and treat reversible causes (e.g. electrolyte abnormalities)

Consider secondary causes

- ACS
- Valvular heart disease
- Thyroid disease
- Heart failure
- Sepsis/infection
- Pulmonary embolism

Investigations

- 12 lead ECG
- CXR
- Bloods (FBC, U+Es, TFTs, bone profile, Mg^{2+}, CRP)

Management (aim for HR <110 bpm)

1st line: IV/PO beta-blocker

→ Bisoprolol 2.5-10mg PO
→ Atenolol 5 mg IV over 5 mins
→ Metoprolol 5 mg IV over 5 mins*

2nd line: IV/PO calcium channel blocker

→ Diltiazem 60-120 mg PO TDS
→ Verapamil 40-120 mg PO TDS
→ Verapamil 5 mg IV over 5 mins*

If evidence of heart failure, consider:

→ Digoxin 500 mcg PO/IV and repeated after 6h if necessary (daily dos 62.5-250 mcg depending on renal function)
→ Amiodarone (seek advice)

*IV doses of metoprolol or verapamil can be repeated at 10-15 min intervals if tolerated and further rate control required

Adverse features?

- Shock
- Syncope
- Myocardial ischaemia
- Heart failure

Seek senior help and consider DCCV

If AF duration <48h:

Consider attempt to restore sinus function

- Flecainide 2 mg/kg (up to max dose 150 mg) IV over 20-30 mins**
- DCCV (with senior and anaesthetic support)

**Flecainide contraindicated if ischaemic or structural heart disease or LV dysfunction

Anticoagulation

- Give treatment-dose LMWH unless contraindicated
- Assess thromboembolic risk as per CHA_2DS_2VASc

Malignant Hypertension
BP ≥180/120 mmHg

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Symptoms
- Headache
- Blurred vision
- Confusion
- **NONE AT ALL**

Signs
- BP ≥180/120 mmHg
- Grade III/IV retinopathy
- Retinal hemorrhage/exudates
- Papilloedema

Consider Secondary Causes
- Intracranial haemorrhage
- Aortic dissection
- Acute glomerulonephritis
- Phaeochromocytoma
- Renal artery stenosis
- Cocaine
- Eclampsia

Investigations
- FBC
- U&E
- Coagulation
- 12 lead ECG

Acute Phase Management
- Target to reduce diastolic BP to 100-110 mmHg over 6 hours
- MAXIMUM DECREASE of 25% from baseline in 24 hours

Labetalol
→ IV infusion at at rate of 15-120 mg/hour (titrate upwards until adequate response- see Labetalol prompt card for guidance)

→ GTN infusion as per trust protocol

Sodium Nitroprusside (under specialist advice only)
→ IV infusion starting at a rate of 0.3 micrograms/kg/min
→ Increase by 0.5 micrograms/kg/min every 5 minutes to 8 micrograms/kg/min

General Measures
- Contact on-call cardiologist/renal/HDU
- Consider arterial line insertion
- Close monitoring of haemodynamics and fluid balance

Severe Pre-Eclampsia

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Definition:
- BP of ≥160/110 mmHg AND proteinuria
  OR
- BP <160/110 mmHg AND 2 or more listed features

1	Immediately inform ED senior and obstetrics on call: • Bleep 8612 (RSCH) • Bleep 6036 (PRH)
2	• Assess and manage ABCDE • Gain IV access • Send FBC, U&E, LFTs, INR, G&S
3	Treatment: • Consider labetalol unless history of steroid dependent asthma or obstructive airway disease (nifedipine is the alternative)
4	Labetalol Dose → 200 mg orally. Repeated every 30-60 mins if BP remains ≥170 mmHg systolic IV labetalol indicated if unable to tolerate oral treatment OR no response → 20 mg as an initial bolus (4 mL of a 100 mg/20 mL vial) → Reassessment at 5 minutes → Repeat if BP ≥170/110 mmHg → MAXIMUM DOSE OF 200 mg

Features of severe pre-eclampsia:
- Severe headache
- Blurred vision + other visual sx
- Vomiting
- Epigastric pain
- Tender liver edge
- Brisk reflexes and clonus
- Papilloedema
- Platelets <100
- Abnormal LFTs – specifically ALT (ALP is elevated in normal pregnancy)

If above features are present and delivery is planned:
→ Give Magnesium Sulphate loading dose AND infusion (overleaf)

Complications:
- Eclampsia
- AKI
- HELLP (Haemolytic anaemia, Elevated Liver enzymes, Low Platelets

SPECIALITY REVIEW IS REQUIRED BEFORE TRANSFER

Eclamptic Seizures

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1	• Dial 2222 state OBSTETRIC EMERGENCY • If still pregnant state NEONATAL EMERGENCY
2	Administer high flow oxygen and maintain airway
3	Place in the left lateral position
4	IV access Send FBC, U&E, LFTs, INR, G&S
5	Continuous BP and oxygen saturation monitoring
6	Commence Magnesium immediately (see below for dose)
7	Commence **Labetalol** as necessary
8	Fetal monitoring and delivery planning

AVOID BENZODIAZEPINES

Seizures in a pregnant woman is eclampsia until proven otherwise.

Remember pregnant women with epilepsy can have eclampsia.

Loading Dose	Maintenance Dose	If Further Seizures
4 g $MgSO_4$ (8 mL of 50% solution)	10 g $MgSO_4$ (20 mL)	Give a further 2 g $MgSO_4$ (4 mL) IV over 5 mins
Mixed with 12 mL N.Saline/5% Dextrose for injection	Mixed with 30 mL water for injection to total volume 50 mL	
IV over 5 mins	Infusion to run at a rate of **1 g/hour (5 mL/hour)**	

Initial Management of Gastrointestinal Haemorrhage

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1	Resuscitate Patient • ABCDE assessment
2	Gain bilateral large bore IV access • Send FBC, U&E, LFTs, Clotting, G&S
3	• Start IV fluids • Shocked patients need four units of cross matched RBC • Patients with liver disease may require more
4	Hourly fluid balance calculation and urine output
5	High risk for variceal bleed OR previous variceal bleed → Terlipressin 2 mg IV (QDS) (1 mg if ischaemic heart/vascular disease) → Tazocin 4.5 g IV → In penicillin allergic gentamicin* and metronidazole
6	Give IV PPI in all patients suspected of having GI bleed
7	Only arrange transfusion if Hb <70 g/dL • Unless advanced liver disease (jaundice, ascites, coagulopathy) OR active ongoing significant GI bleeding where resuscitation on ongoing
8	Calculate Glasgow Blatchford score
9	Early ITU/HDU review if poor response to initial resuscitation

Correct Clotting

- STOP anticoagulants (contact cardiology if metallic valve present)
- Stop antiplatelets (contact cardiology if <3 months since PCI)
- Give Vit K 10 mg IV if known liver disease
- Check ROTEM and correct according to result
- If on DOAC, discuss with endoscopist on-call + GIM consultant on-call for consideration of Andexanet Alfa
- If on DOAC, contact haematology
- If on DOAC with renal impairment, contact renal

*caution with advanced liver disease

Endoscopy Referral

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Endoscopy Referral

RSCH In Hours Contact Acute Medical Consultant to review all patients ext 3232

- **Possible Variceal Bleed** Immediate referral to GI SpR/endoscopist ext 4570 & make critical care referral
- **Score ≥ 12** Immediate referral to GI SpR/endoscopist ext 4570 & make critical care referral
-
- **Score 2-12** contact acute medical consultant/medical registrar and request endoscopy.
- **Score < 2 (Low Risk)If no other reason for admission other than GI bleeding** discharge patient and fill in endoscopy referral form. Gastroenterology will arrange outpatient endoscopy and follow up.

PRH In Hours

- **Score ≥ 2** Discuss with PRH acute medical consultant & senior endoscopy nurse on Cuckfield ward; if PRH endoscopy not available contact RSCH GI SpR/endoscopist ext 4570
- **Score < 2 (Low Risk)If no other reason for admission other than GI bleeding** discharge patient and fill in endoscopy referral form. Gastroenterology will arrange outpatient endoscopy and follow up.

RSCH Out of Hours Medical registrar to review patient prior to contacting endoscopist

- **Possible Variceal Bleed** contact endoscopist via switchboard & make critical care referral
- **Score ≥ 12** contact endoscopist via switchboard & make critical care referral
- **Score 2-12** contact medical registrar and contact endoscopist if evidence of significant/ongoing bleeding
- **Score < 2 (Low Risk)If no other reason for admission other than GI bleeding** discharge patient and fill in endoscopy referral form. Gastroenterology will arrange outpatient endoscopy and follow up.

PRH Out of Hours

- **score >2** Discuss with medical registrar at RSCH and transfer
- **Score < 2 (Low Risk)If no other reason for admission other than GI bleeding** discharge patient and fill in endoscopy referral form. Gastroenterology will arrange outpatient endoscopy and follow up.

Emergency Laparotomy Risk Assessment

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High Risk Criteria

2 or more of
- RR >20
- WBC <4 OR >12
- HR >90
- Temp <36 OR >38

And Organ Dysfunction
- Systolic BP <90 mmHg despite fluids
- Oxygen required to keep SpO_2 >90%

- Lactate >2
- NEWS >5
- Age >70
- Age >50 and significant comorbidity

1	If any of the above: inform A&E consultant Obtain senior surgical review/discussion within 30 minutes

2

A&E Team
- Oxygen
- Large bore cannula & fluid resuscitation
- Catheterise and fluid balance chart
- Bloods FBC, U&E, LFT, clotting, G&S x2, lactate, amylase
- Administer antibiotics as per Microguide

3

Surgical Team
- Ensure above is complete
- CT scan (state emergency laparotomy on form) within 2 hours
- Inform anesthetist (bleep 8224)
- Next available slot on emergency theatre list
- Add patient to NELA database

Emergency Management of Epistaxis RSCH

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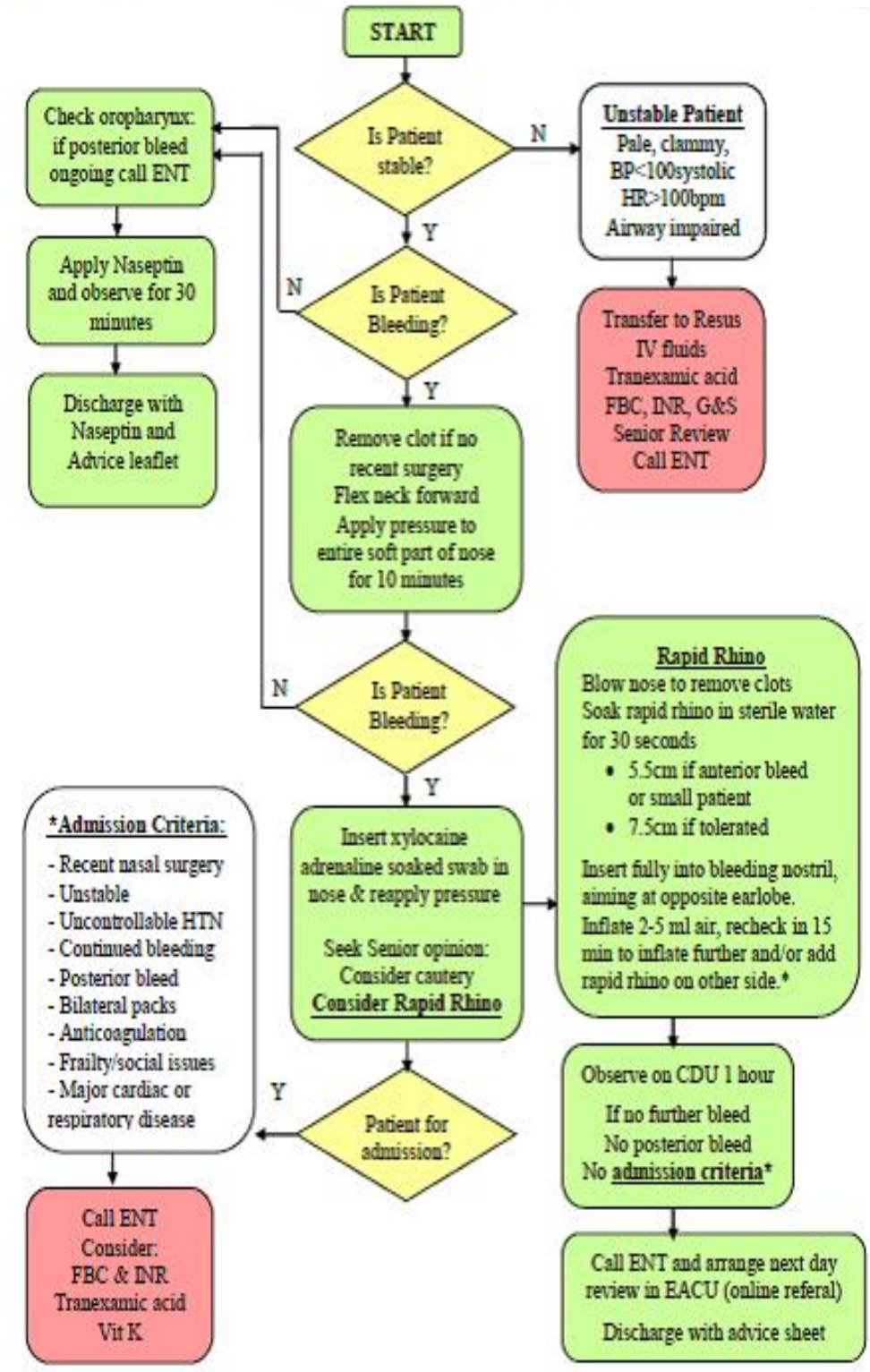

General Approach to Managing Overdose

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A	Assess airway Contact Anesthetic team if required
B	• **RR** – If depressed and suspicious for opioid toxicity consider Naloxone 400 mcg initial dose (see Naloxone prompt card) • **O2 saturations** – Aim saturations 94-98% in all patients • Carbon monoxide poisoning suspected – high flow oxygen (15 L/min via non-rebreather mask)
C	• **BP** – Hypotensive 250-500 mL 0.9% NaCl IV boluses, assess response. • Hypertensive + tachycardia – consider Beta blockers • **HR** – Bradycardic – 500 mcg atropine / external pacing. • For tachyarrhythmia - consider metoprolol 2.5-5 mg IV, consider magnesium sulphate 2 g IV • **VBG / ABG** – If elevated lactate give IV fluids, and replace electrolytes as appropriate • **Venous bloods** – FBC, U+Es, LFTs, clotting, CK, paracetamol + salicylate levels • **ECG** – Assess QT interval, tachy/brady-arrhythmias, ischaemic changes – consider magnesium sulphate and calcium gluconate. • **NB:** Remember sodium bicarbonate for TCA overdose.
D	• **GCS** <8 requires intubation and ventilation • **Agitation** – Diazepam 5-10 mg PO / lorazepam 1-2 mg IV, titrate according to response – for anxiolysis **NOT** sedation • **Pupils** – Useful in determining toxidrome (see Toxidrome prompt card) • **BM** – For severe hypoglycaemia give 150 mL 10% dextrose or 75 mL 20% dextrose IV over 10 mins • **Temp** – For hyperthermia, cool with IV fluids and ice packs • **Catheterise** – urine dip + send
E	**Expose** and assess for other pathology – **DO NOT** miss traumatic injury or compartment syndrome after long lie.

Drug Overdose - Toxidromes

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Toxidrome	Vitals	Pupils	Other Symptoms	Drugs
Sympathomimetic	 • Temp • HR • RR • BP	Mydriasis	Hyperalert, agitation, hallucinations Diaphoresis, tremors, hyper-reflexia, seizures	Cocaine, amphetamines, ephedrine, pseudoephedrine, theophylline, caffeine
Anticholinergic	 • Temp • HR • RR • BP	Mydriasis	Hypervigilance, agitation, hallucinations, coma Dry, flushed skin, dry mucous membranes, decreased bowel sounds, urinary retention, myoclonus, seizes (rarely)	Antihistamines, tricyclics, anti-Parkinson agents, antispasmodics, phenothiazines (anti-psychotics), atropine
Hallucinogenic	 • Temp • HR • RR • BP	Mydriasis	Hallucinations, agitation Nystagmus	Phencyclidine, LSD, MDMA ("Ecstasy“)
Serotonin Syndrome	 • Temp • HR • RR • BP	Mydriasis	Tremor, myoclonus, hyper-reflexia, clonus, diaphoresis, flushing, rigidity, diarrhoea	MAOIs alone or with SSRIs, TCAs, L-tryptophan
Opioid	• Temp • HR • RR • BP 	Miosis	CNS depression, coma Hyporeflexia, pulmonary oedema, needle marks	Opioids e.g. heroin, morphine, methadone, oxycodone
Sedative / Hypnotic	• Temp • HR • RR • BP 	Miosis / Mydriasis	CNS depression, confusion, coma Hyporeflexia	Benzodiazepines, barbiturates, alcohols
Cholinergic	• Temp • HR • RR • BP 	Miosis	Confusion, coma Salivation, incontinence, diarrhoea, emesis, diaphoresis, lacrimation, GI cramps, bronchoconstriction, muscle fasciculation / weakness, seizures	Organophosphate and carbamate insecticides, nerve agents, nicotine, pilocarpine, edrophronium

Care of the Dying Patient

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Have you recognised your patient may day in the coming hours or days?

- Deliver the five priories for the care of the dying

1	Recognise • The possibly that a person may die within the next few hours or days
2	Communication • Sensitive communication between staff, the dying person and those identified as important to them
3	Involve • The dying person and those identified as important to them are involved in decisions about treatment and care • To the extent the dying person wants
4	Support • Actively explore the needs of patient and those identified as important to them
5	Plan and deliver • An individual care plan • Including food &drink • Symptom control • Psychological, spiritual and social support

Ensure you:

- Have considered potentially **reversible causes** which may be appropriately treated
- **Assess symptoms** and **prescribe** appropriate medication
- Assess need for clinically assisted **hydration and nutrition**
- **Clarify any prior expressed wishes**/review any advance care plans

Remember:

- Involve senior decision maker
- Refer to palliative care on bamboo
- RSCH EXT 3021 Bleep 8420, OOH Martlets hospital
- PRH EXT 3021, bleep 8420 OOH St Peter & St James Hospital
- If admission NOT wanted and discharge feasible contact palliative care team urgently

After assessment and conversations, use these documents found on Microguide:

1. Individualised care plan (doctor to complete - follow prompts on chart)
2. Symptom observation chart for a dying person
3. Nursing care plan for a dying person
4. Drug chart with appropriate symptom control medication

End of Life Care Prescribing

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- All patients recognised as dying must have pre-emptive medication prescribed PRN for control of common symptoms
- Ensure a dose is administered if symptomatic
- If PRN not controlling symptoms (≥3 doses in 24-hour period) seek specialist advice or consider syringe pump
- See Microguide for further prescribing guidance under palliative care section

Symptom	Drug	Dose	Frequency	
			Pain	**Dyspnoea**
Pain / breathlessness	1st line: Diamorphine	2.5-5 mg SC	1 hourly	4 hourly
	2nd line: Morphine	5 mg SC	1 hourly	4 hourly
Known severe renal failure eGFR <30 mL/min:	Alfentanil	0.25-0.5 mg SC	1 hourly	4 hourly
Nausea	Haloperidol	1.5 mg SC	4 hourly	
Distress from anxiety	Midazolam	2.5-5 mg SC	1 hourly	
Distress/agitation from delirium	Haloperidol	1-2.5 mg SC	4 hourly	
Respiratory secretions	Glycopyrronium	0.2 mg SC	4 hourly	

Contacts

Palliative care Team 9-5 Mon-Fri
- Bleep 8420
- Ext 3021

RSCH OOH – Martlets
- 01273964164

PRH OOH St Peters and St James
- 01444471598

Medicine information
- EXT 8153/8566

- If patient on **existing regular opioids or other symptom control medication** consult online guidance for conversions and advice on starting a regular SC infusion (syringe pump)
- **Review and discontinue non-essential medication**. For essential medication which cannot be taken orally (e.g. anti epileptics) see online guidance

Consult palliative care team or pharmacist for complex symptom management

Hyperthermia

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Features
- Temperature >40°C
- Tachycardia
- Tachypnea
- Hypotension
- Muscle rigidity
- Altered GCS

Investigations
- Rectal or oesophageal thermometer
- ECG
- CXR
- Bloods: FBC, U&Es, LFTs, clotting, VBG, calcium, phosphate, CK
- Consider paracetamol and salicylate levels
- CT head

Management
- Cold IV fluids in 250 mL boluses (to avoid pulmonary oedema)
- Strip patient
- Spray with cold tap water mist and set fans on patient
- Ice packs to neck, groins and axillae
- Consider ice packs to cheeks, palms and soles
- Catheter
- IV benzodiazepines for shivering or seizures

Information
- Cold fluids in fridge in resus
- Bags for ice and spray bottles in box
- Ice in freezer in staff room or send porter to Pebbles Restaurant
- Consider referral to HDU/ITU

Benzodiazepines
- Midazolam: 0.1-0.2 mg/kg to a max of 4 mg
- Lorazepam: 0.1 mg/kg to a max dose of 4 mg

Dantrolene
- **Only** for use in malignant hyperthermia
- 2.5 mg/kg IV initially
- Repeat doses of 1 mg/kg (max dose of 10 mg/kg)

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Emergency

Prompt Cards

Anaesthetics and Resuscitation

Sedation Checklist

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1. Prepare Team and Patient

Discuss procedure to be performed:

Consent obtained?

Allocate roles:
- Name of doctor performing the sedation
- Name of nurse
- Name of doctor performing the procedure

Is there a plan to get extra help if required?

Airway assessed?
Mallampati score (I-IV)

Fasting time food?
Fasting time clear fluid?
If not NBM for more than 6 hours food or 2 hours clear fluids GET SENIOR ADVICE

Are the benefits of preforming the procedure greater than the risks?

2. Prepare Equipment

Is all monitoring on?
- Capnography
- Is BP cycling every three minutes?

Is all equipment available and checked?
- Guedel/NPA/Bag Mask
- Working suction
- Tagged ventilation bag
- Tagged intubation box
- Bougie
- Supraglottic airway
- Difficult airway trolley

Does the patient have IV access with IV fluids running?

100% oxygen (unless contraindicated)
Are drugs drawn up and labelled?
- Sedation agent?
- Analgesia?

Are emergency drugs available?
- Vasopressors
- Reversal agent
- NMJ blocker
- Induction agent

3. Prepare for difficulty

What is the plan for over sedation?
Reversal plus plan for
- Plan A: Bag Mask
- Plan B Supraglottic airway
- Plan C: e.g. intubation
- Plan D: Difficult airway protocol

Have you access to the relevant equipment, including alternative airway?

DO NOT START UNTIL AVAILABLE

Are there any specific complications anticipated?
Yes/No

If yes, what are they?
DO YOU NEED MORE HELP NOW?

SILENCE DURING PROCEEDURE

RECORD ANY RSI OR SEDATION IN THE EMERGENCY DEPARTMENT @ BAMBOO.BSUH.NHS.UK

RSI (Rapid Sequence Induction) Checklist: to be done with the whole team present

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Prepare the patient

- ❑ **Reliable IV / IO access**
- ❑ **Optimise position**
  - ❑ Sit-up?
  - ❑ Mattress hard
- ❑ **Airway assessment**
  - ❑ Identify cricothyroid membrane
  - ❑ Awake intubation option?
- ❑ **Optimal preoxygenation**
  - ❑ 3 mins or ETO_2 > 85%
  - ❑ Consider CPAP / NIV
  - ❑ Nasal O_2
- ❑ **Optimise patient state**
  - ❑ Fluid / pressor/ inotrope
  - ❑ Aspirate NG tube
  - ❑ Delayed sequence induction
- ❑ **Allergies?**
  - ❑ ↑ Potassium risk?
    - avoid suxamethonium

Prepare the equipment

- ❑ **Apply monitors**
  - ❑ SpO_2 / waveform $ETCO_2$ / ECG / BP
- ❑ **Check equipment**
  - ❑ Tracheal tubes x 2
    - cuffs checked
  - ❑ Direct laryngoscopes x 2
  - ❑ Videolaryngoscope
  - ❑ Bougie / stylet
  - ❑ Working suction
  - ❑ Supraglottic airways
  - ❑ Guedel / nasal airways
  - ❑ Flexible scope / Aintree
  - ❑ FONA set
- ❑ **Check drugs**
  - ❑ Consider ketamine
  - ❑ Relaxant
  - ❑ Pressor / inotrope
  - ❑ Maintenance sedation

Prepare the team

- ❑ **Allocate roles**

One person may have more than one role.

- ❑ Team Leader
- ❑ 1st Intubator
- ❑ 2nd Intubator
- ❑ Cricoid force
- ❑ Intubator's assistant
- ❑ Drugs
- ❑ Monitoring patient
- ❑ Runner
- ❑ MILS (if indicated)
- ❑ Who will perform FONA?

- ❑ **Who do we call for help?**
- ❑ **Who is noting the time?**

Prepare for difficulty

- ❑ **Can we wake the patient if intubation fails?**
- ❑ **Verbalise** "Airway Plan is:"
  - ❑ **Plan A:**
    Drugs & laryngoscopy
  - ❑ **Plan B/C:**
    Supraglottic airway
    Face-mask
    Fibreoptic intubation via supraglottic airway
  - ❑ **Plan D:**
    FONA
    Scalpel-bougie-tube
- ❑ **Does anyone have questions or concerns?**

For all intubations outside of theatres consider contacting anaesthetics: RSCH

- Phone ext 62043 – or bleep 8224 – senior trainee or consultant anaesthetist
- ODP bleep 8180
- Or 'Anaesthetic emergency call' via switchboard 2222

RSI (Rapid Sequence Induction) Checklist: to be done with the whole team present

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Prepare the patient

- ❑ **Reliable IV / IO access**
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  - ❑ Awake intubation option?
- ❑ **Optimal preoxygenation**
  - ❑ 3 mins or ETO_2 > 85%
  - ❑ Consider CPAP / NIV
  - ❑ Nasal O_2
- ❑ **Optimise patient state**
  - ❑ Fluid / pressor/ inotrope
  - ❑ Aspirate NG tube
  - ❑ Delayed sequence induction
- ❑ **Allergies?**
  - ❑ ↑ Potassium risk?
    - avoid suxamethonium

Prepare the equipment

- ❑ **Apply monitors**
  - ❑ SpO_2 / waveform $ETCO_2$ / ECG / BP
- ❑ **Check equipment**
  - ❑ Tracheal tubes x 2
    - cuffs checked
  - ❑ Direct laryngoscopes x 2
  - ❑ Videolaryngoscope
  - ❑ Bougie / stylet
  - ❑ Working suction
  - ❑ Supraglottic airways
  - ❑ Guedel / nasal airways
  - ❑ Flexible scope / Aintree
  - ❑ FONA set
- ❑ **Check drugs**
  - ❑ Consider ketamine
  - ❑ Relaxant
  - ❑ Pressor / inotrope
  - ❑ Maintenance sedation

Prepare the team

- ❑ **Allocate roles**

One person may have more than one role.

- ❑ Team Leader
- ❑ 1st Intubator
- ❑ 2nd Intubator
- ❑ Cricoid force
- ❑ Intubator's assistant
- ❑ Drugs
- ❑ Monitoring patient
- ❑ Runner
- ❑ MILS (if indicated)
- ❑ Who will perform FONA?

- ❑ **Who do we call for help?**
- ❑ **Who is noting the time?**

Prepare for difficulty

- ❑ **Can we wake the patient if intubation fails?**
- ❑ **Verbalise** "Airway Plan is:"
  - ❑ **Plan A:**
    Drugs & laryngoscopy
  - ❑ **Plan B/C:**
    Supraglottic airway
    Face-mask
    Fibreoptic intubation via supraglottic airway
  - ❑ **Plan D:**
    FONA
    Scalpel-bougie-tube
- ❑ **Does anyone have questions or concerns?**

For all intubations outside of theatres consider contacting anaesthetics: PRH

- PRH Airway bleep 6442 / 6010
- ODP bleep 6118
- Or 'Anaesthetic emergency call' via switchboard 2222

Emergency Checklist for RSI

NHS University Hospitals Sussex NHS Foundation Trust

If arrest or peri-arrest situation with oxygen saturations falling:

1	Oxygen
2	IV Access
3	Drugs
4	Laryngoscope
5	Suction
6	Bougie
7	Tube & Syringe
8	CO_2 Monitoring
9	Bag Valve Mask
10	FONA set

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Management of unanticipated difficult tracheal intubation in adults

2015

Plan A: Facemask ventilation and tracheal intubation

Optimise head and neck position
Preoxygenate
Adequate neuromuscular blockade
Direct / Video Laryngoscopy (maximum 3+1 attempts)
External laryngeal manipulation
Bougie
Remove cricoid pressure
Maintain oxygenation and anaesthesia

If in difficulty → call for help

Succeed → Confirm tracheal intubation with capnography

Declare failed intubation

Plan B: Maintaining oxygenation: SAD insertion

2nd generation device recommended
Change device or size (maximum 3 attempts)
Oxygenate and ventilate

Succeed →

STOP AND THINK

Options (consider risks and benefits):

1. Wake the patient up
2. Intubate trachea via the SAD
3. Proceed without intubating the trachea
4. Tracheostomy or cricothyroidotomy

Declare failed SAD ventilation

Plan C: Facemask ventilation

If facemask ventilation impossible, paralyse
Final attempt at facemask ventilation
Use 2 person technique and adjuncts

Succeed → Wake the patient up

Declare CICO

Plan D: Emergency front of neck access

Scalpel cricothyroidotomy

Post-operative care and follow up

- Formulate immediate airway management plan
- Monitor for complications
- Complete airway alert form
- Explain to the patient in person and in writing
- Send written report to GP and local database

This flowchart forms part of the DAS Guidelines for unanticipated difficult intubation in adults 2015 and should be used in conjunction with the text.

Failed intubation, failed oxygenation in the paralysed, anaesthetised patient

DIFFICULT AIRWAY SOCIETY DAS 2015

CALL FOR HELP

↓ Continue 100% O_2
Declare CICO

Plan D: Emergency front of neck access

Continue to give oxygen via upper airway
Ensure neuromuscular blockade
Position patient to extend neck

Scalpel cricothyroidotomy

Equipment: 1. Scalpel (number 10 blade)
2. Bougie
3. Tube (cuffed 6.0mm ID)

Laryngeal handshake to identify cricothyroid membrane

Palpable cricothyroid membrane

Transverse stab incision through cricothyroid membrane
Turn blade through 90° (sharp edge caudally)
Slide coude tip of bougie along blade into trachea
Railroad lubricated 6.0mm cuffed tracheal tube into trachea
Ventilate, inflate cuff and confirm position with capnography
Secure tube

Impalpable cricothyroid membrane

Make an 8-10cm vertical skin incision, caudad to cephalad
Use blunt dissection with fingers of both hands to separate tissues
Identify and stabilise the larynx
Proceed with technique for palpable cricothyroid membrane as above

Post-operative care and follow up

- Postpone surgery unless immediately life threatening
- Urgent surgical review of cricothyroidotomy site
- Document and follow up as in main flow chart

This flowchart forms part of the DAS Guidelines for unanticipated difficult intubation in adults 2015 and should be used in conjunction with the text.

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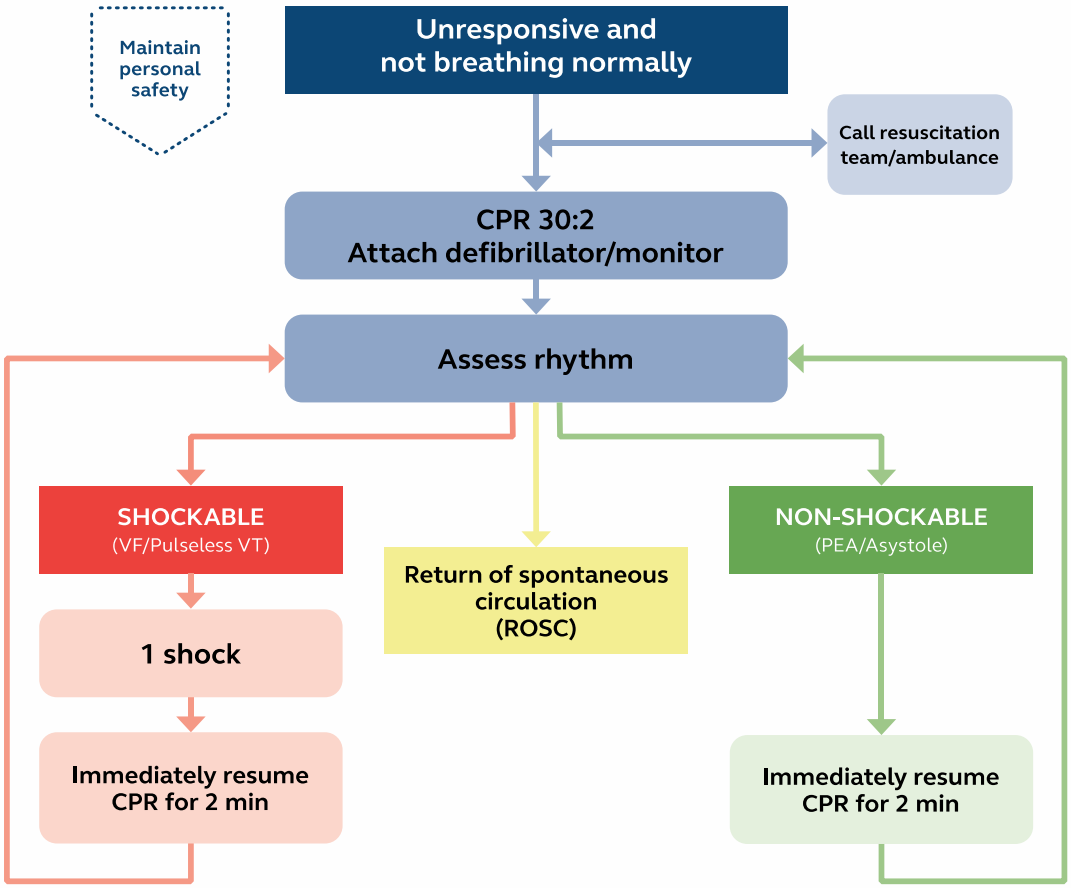
GUIDELINES 2021

Adult advanced life support



Give high-quality chest compressions, and:

- Give oxygen
- Use waveform capnography
- Continuous compressions if advanced airway
- Minimise interruptions to compressions
- Intravenous or intraosseous access
- Give adrenaline every 3–5 min
- Give amiodarone after 3 shocks
- Identify and treat reversible causes

Identify and treat reversible causes

- Hypoxia
- Hypovolaemia
- Hypo-/hyperkalaemia/ metabolic
- Hypo/hyperthermia
- Thrombosis – coronary or pulmonary
- Tension pneumothorax
- Tamponade – cardiac
- Toxins

Consider ultrasound imaging to identify reversible causes

Consider

- Coronary angiography/ percutaneous coronary intervention
- Mechanical chest compressions to facilitate transfer/treatment
- Extracorporeal CPR

After ROSC

- Use an ABCDE approach
- Aim for SpO_2 of 94–98% and normal $PaCO_2$
- 12-lead ECG
- Identify and treat cause
- Targeted temperature management

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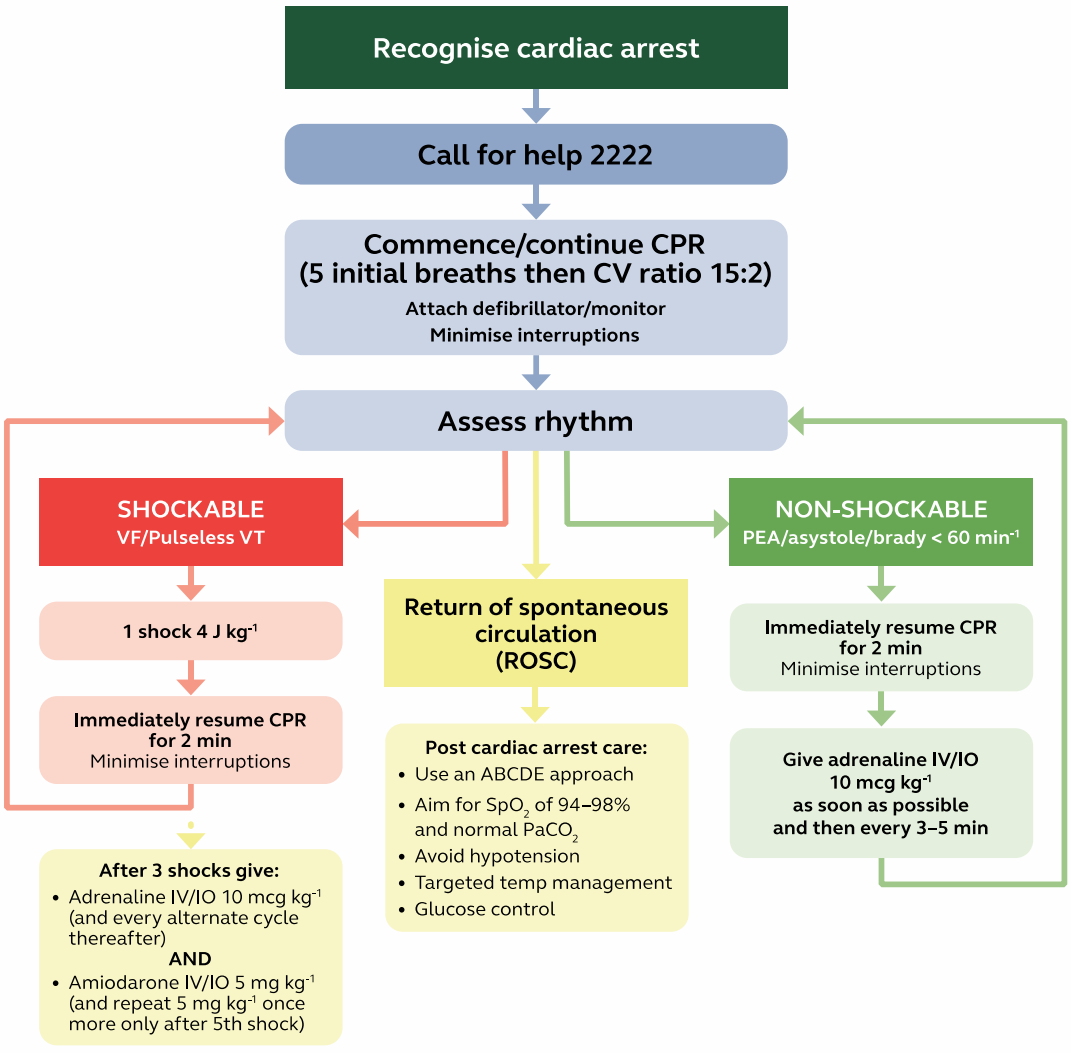
GUIDELINES 2021

Paediatric advanced life support



During CPR

- **Ensure high quality chest compressions are delivered:**
  - Correct rate, depth and full recoil
- Provide BMV with 100% oxygen (2 person approach)
- Provide continuous chest compressions when a tracheal tube is in place.
- Competent providers can consider an advanced airway and capnography, and ventilate at a rate (breaths minute^{-1}) of:

Infants: 25	1–8 years: 20	8–12 years: 15	> 12 years: 10–12

- Vascular access IV/IO
- Once started, give Adrenaline every 3-5 min
- Maximum single dose Adrenaline 1 mg
- Maximum single dose Amiodarone 300 mg

Identify and treat reversible causes

- Hypoxia
- Hypovolaemia
- Hyperkalaemia, hypercalcaemia, hypermagnesemia, hypoglycaemia
- Hypo-/hyperthermia
- Thrombosis – coronary or pulmonary
- Tension pneumothorax
- Tamponade – cardiac
- Toxic agents

Adjust algorithm in specific settings (e.g. special circumstances)

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GUIDELINES 2021

Newborn life support

(Antenatal counselling)
Team briefing and equipment check

Birth
Delay cord clamping if possible

Start clock / note time
Dry / wrap, stimulate, keep warm

Assess
Colour, tone, breathing, heart rate

Ensure an open airway
Preterm: consider CPAP

If gasping / not breathing
- **Give 5 inflations (30 cm H_2O) – start in air**
- Apply PEEP 5–6 cm H_20, if possible
- Apply SpO_2 +/- ECG

Reassess
If no increase in heart rate, look for chest movement

If the chest is not moving
- Check mask, head and jaw position
- 2 person support
- Consider suction, laryngeal mask/tracheal tube
- Repeat inflation breaths
- Consider increasing the inflation pressure

Reassess
If no increase in heart rate, look for chest movement

Once chest is moving continue ventilation breaths

If heart rate is not detectable or < 60 min^{-1} after 30 seconds of ventilation
- Synchronise 3 chest compressions to 1 ventilation
- Increase oxygen to 100%
- Consider intubation if not already done or laryngeal mask if not possible

Reassess heart rate and chest movement every 30 seconds

If the heart rate remains not detectable or < 60 min^{-1}
- **Vascular access and drugs**
- Consider other factors e.g. pneumothorax, hypovolaemia, congenital abormality

Update parents and debrief team
Complete records

Preterm < 32 weeks

Place undried in plastic wrap + radiant heat

Inspired oxygen
28–31 weeks 21–30%
< 28 weeks 30%

If giving inflations, start with 25 cm H_2O

Acceptable pre-ductal SpO_2	
2 min	65%
5 min	85%
10 min	90%

TITRATE OXYGEN TO ACHIEVE TARGET SATURATIONS

APPROX 60 SECONDS

MAINTAIN TEMPERATURE

AT ALL TIMES ASK **"IS HELP NEEDED"**

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Paediatric Massive Haemorrhage Protocol

NHS University Hospitals Sussex NHS Foundation Trust

- Massive haemorrhage with signs of hypovolaemic shock or with no likelihood of control
- Anticipated or actual blood loss of 40 ml/kg

If trauma, call 2222. State "Paediatric code red trauma call" and give location. Call the Blood Transfusion Laboratory (the "Lab") ext 4577 or bleep 8286:

- "I am activating the Paediatric code red protocol"
- Patient identification – Hospital Number, name & date of birth and (estimated) weight of child
- Patient location – RSCH ED resus or main theatres or location in the Royal Alexandra Children's Hospital.
- Name and contact details of person activating protocol for ongoing communication
- Order **Paediatric code red pack** (adult code red pack B)

Team Leader to:

- Nominate a member of the team to act as Communication Lead
- Nominate the Code Red Porter to convey blood samples and blood components
- Nominate a Blood Coordinator to ensure "right blood, right patient" and full traceability documentation

The Lab will prepare the Paediatric code red pack.
Non-group specific packed red cells will be available immediately

Lab staff will ring communication lead with results of urgent investigations and to inform them that blood components are ready.

Communication lead will ring the Lab if they require further components before the first pack is used up.

Ensure the Lab is informed if ONCOLOGY PATIENT or IMMUNOSUPPRESSED if irradiated blood is required.

Availability of Blood for Collection

O Neg blood for girls,

O Pos blood for boys:
Immediate

Cross matched blood:
45 minutes

Fresh Frozen Plasma:
30 minutes to thaw

Cryoprecipitate:
30 minutes to thaw

Platelets:
Immediate if on site
Replacement delivery up to 2 hours

- **Insert 2 x IV or IO access**
- **Take bloods for** Group & screen, FBC and coagulation screen with fibrinogen level at baseline. Aim at least 2 ml EDTA sample (*ensure a minimum of 1 ml EDTA sample sent for crossmatch as a priority – use purple top paediatric bottle)*
- **Use bloodhound labelling or handwritten if not available** – *minimum patient identifiers UNK F/ M with unique HN, ideally name / DOB / HN.*
- Give 15 mg/kg Tranexamic acid (max 1 g) intravenously over 10 minutes then infuse 2 mg/kg/hour (max 125 mg/hour)
- Use 10 ml/kg warmed normal saline boluses until emergency blood available or Paediatric code red pack arrives

Attempt to get second group and save sample before starting the Paediatric code red pack.
Give Blood → FFP → Blood → Cryo in **10 ml/kg aliquots**
Blood aliquots to be given sequentially, not concurrently

Ongoing bleeding?

Take bloods – FBC, U+E, INR, APTT, fibrinogen, gas and second G&S if not already obtained.
Reassess blood loss and response to treatment
Ensure clear plan for definitive haemorrhage control

Give Platelets 10 ml/kg after 40 ml/kg blood products
Give Blood → FFP → Blood → Cryo in **10 ml/kg aliquots**
Blood aliquots to be given sequentially, not concurrently

Resolution of bleeding

- Stand down of protocol
- Ensure documentation complete
- Return unused bags to lab within 4 hours

- Aim core temperature > 36°C
- Aim for platelets > 75 x10^9/L
- Aim for fibrinogen > 2 g/L
- Aim for INR / APPT ratio < 1.5
- Aim Hb 80 – 100 g/L

- Keep base excess < –6 mmol/L
- Keep ionised Ca > 1 mmol/L
- Keep K < 6.0 mmol/L

Paediatric code red pack = adult code red pack B

	Dose	
	Child	Adult (≥ 60 kg)*
Blood (PRC)	10 ml/kg	See adult code red protocol
FFP	10 ml/kg	
Cryoprecipitate	10 ml/kg	
Platelets	10 ml/kg	

*Child ≥ 60 kg = manage as per adult protocol

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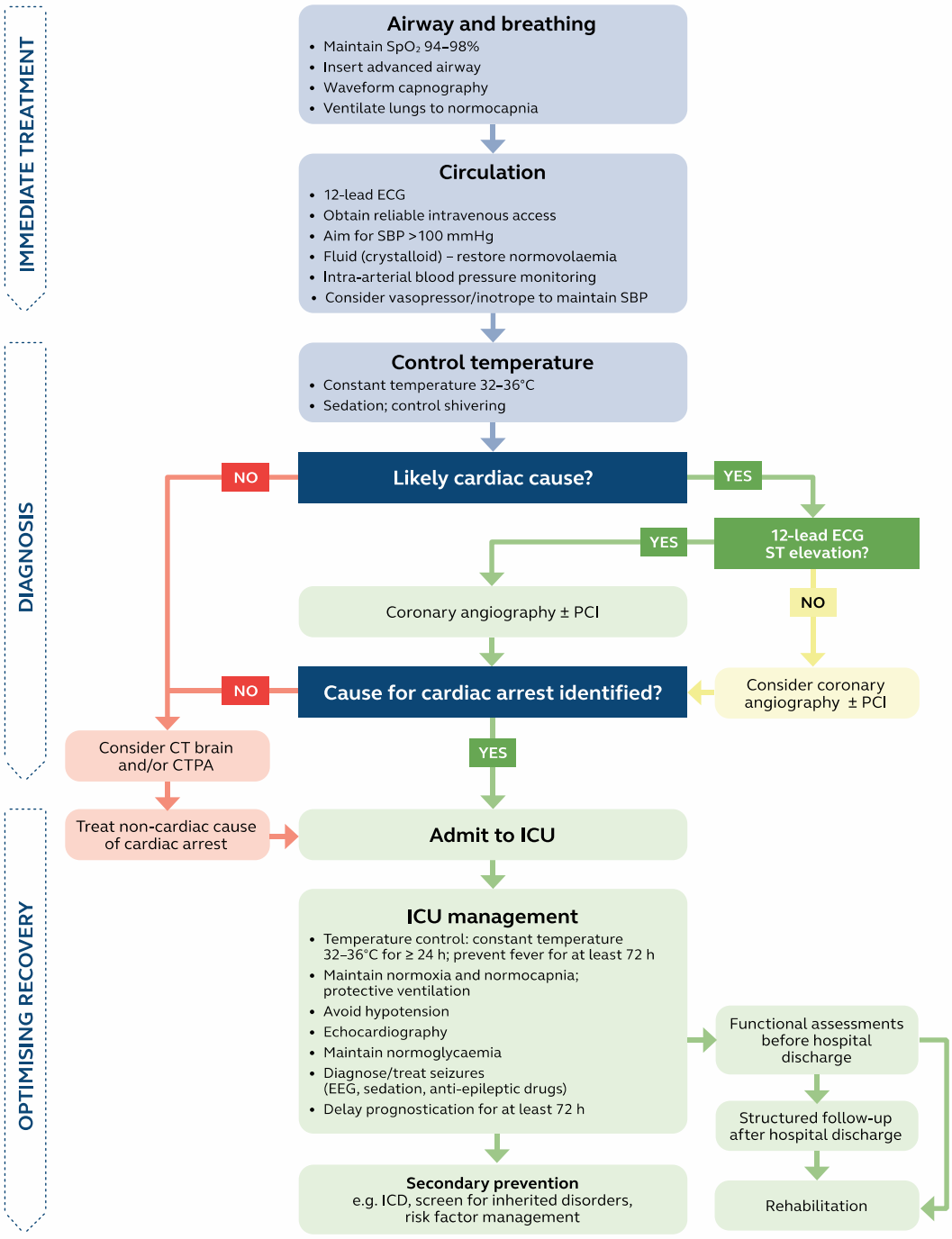
Adult post resuscitation care



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GUIDELINES 2021

Adult tachycardia

Assess with ABCDE approach

- Give oxygen if SpO_2 < 94%
- Obtain IV access
- Monitor ECG, BP, SpO_2, record 12-lead ECG
- Identify and treat reversible causes e.g. electrolyte abnormalities, hypovolaemia causing sinus tachycardia

Life threatening features?

1. Shock
2. Syncope
3. Myocardial ischaemia
4. Severe heart failure

YES

Synchronised DC shock up to 3 attempts

- Sedation or anaesthesia if conscious

If unsuccessful:

- Amiodarone 300 mg IV over 10–20 min
- Repeat synchronised DC shock

UNSTABLE

STABLE
Seek expert help

NO

Is the QRS narrow (< 0.12 s)?

BROAD QRS
Is QRS regular?

IRREGULAR

Possibilities include:

- Atrial fibrillation with bundle branch block treat as for irregular narrow complex
- Polymorphic VT (e.g. torsades de pointes) give magnesium 2 g over 10 min

REGULAR

If VT (or uncertain rhythm):

- Amiodarone 300 mg IV over 10–60 min

If previous certain diagnosis of SVT with bundle branch block/ aberrant conduction:

- Treat as for regular narrow complex tachycardia

NARROW QRS
Is QRS regular?

REGULAR

Vagal manoeuvres

If ineffective:

- Give Adenosine (if no pre-excitation)
  - 6 mg rapid IV bolus
  - If unsuccessful, give 12 mg
  - If unsuccessful, give 18 mg
- Monitor ECG continuously

If ineffective:

- Verapamil or beta-blocker

IRREGULAR

Probable atrial fibrillation:

- Control rate with beta-blocker
- Consider digoxin or amiodarone if evidence of heart failure
- Anticoagulate if duration > 48 h

If ineffective:

- Synchronised DC shock up to 3 attempts
- Sedation or anaesthesia if conscious

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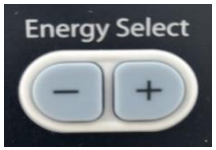
Direct Current Cardioversion (DCCV)

(See Adult Tachycardia for algorithm)

1. **Sedation** or **general analgesia** for conscious patients
2. Attach **3 lead ECG and** defibrillation pads & turn dial to **Manual Defib**
3. Press **Enter Sync** button 

and observe sense markers
4. If necessary, press lead 

to select lead with most sense markers
5. Press 

Broad complex: 150j, 200j then 360j
Atrial fibrillation: 360j (up to three times)
Other narrow complex: 100j, 200j then 360j
6. Remove oxygen, clear and press charge button 
7. **Confirm SYNC mode**, Press **and hold** 

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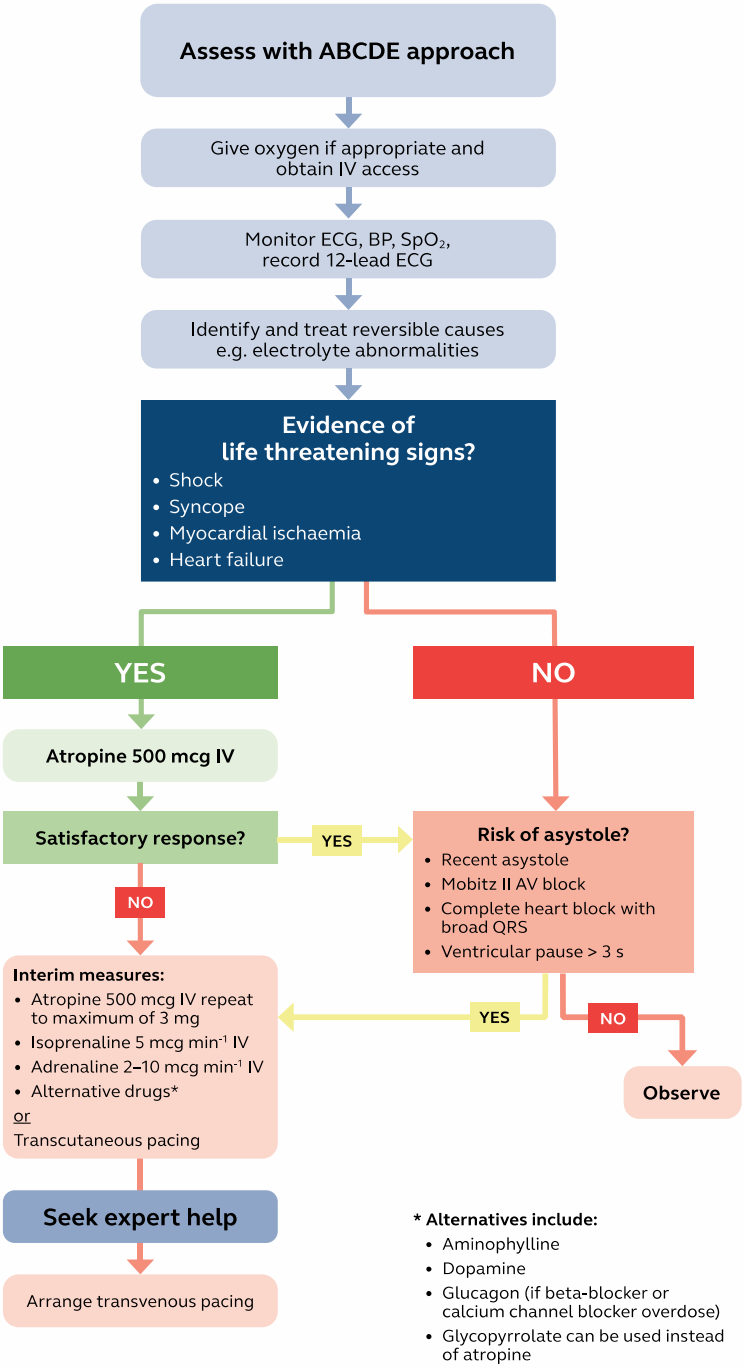
Adult bradycardia



Bradyarrhythmia

External pacing

(See Adult Bradycardia for algorithm)

1. Attach 3 lead ECG and defibrillation pads
2. Turn dial to **Pacer** using the control dial  ight and select **Pacer Rate**.
3. Turn control dial to select desired rate 

s control dial to confirm rate.
4. Using control dial select **Pacer Output** 

5. Turn Control dial to increase current until **electrical capture.**
6. **Palpate central pulse** to confirm **mechanical capture.** Press control dial to confirm current.

   If necessary, increase Pacer Output until mechanical capture.

   Increase **Pacer Output** by 10% and continuously monitor central pulse.
7. Consider **sedation** and/or **analgesia** if patient uncomfortable.

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Anaphylaxis

Anaphylaxis?

A = Airway B = Breathing C = Circulation D = Disability E = Exposure

Diagnosis – look for:

- Sudden onset of Airway and/or Breathing and/or Circulation problems[1]
- And usually skin changes (e.g. itchy rash)

Call for HELP

Call resuscitation team or ambulance

- Remove trigger if possible (e.g. stop any infusion)
- Lie patient flat (with or without legs elevated)
  - A sitting position may make breathing easier
  - If pregnant, lie on left side

Give intramuscular (IM) adrenaline[2]

Inject at **anterolateral aspect** – middle third of the thigh

- Establish airway
- Give high flow oxygen
- Apply monitoring: pulse oximetry, ECG, blood pressure

If no response:

- Repeat IM adrenaline after 5 minutes
- IV fluid bolus[3]

If no improvement in Breathing or Circulation problems[1] despite TWO doses of IM adrenaline:

- Confirm resuscitation team or ambulance has been called
- Follow REFRACTORY ANAPHYLAXIS ALGORITHM

1. Life-threatening problems

Airway
Hoarse voice, stridor

Breathing
↑work of breathing, wheeze, fatigue, cyanosis, SpO_2 <94%

Circulation
Low blood pressure, signs of shock, confusion, reduced consciousness

2. Intramuscular (IM) adrenaline

Use adrenaline at 1 mg/mL (1:1000) concentration

Adult and child >12 years:	500 micrograms IM (0.5 mL)
Child 6–12 years:	300 micrograms IM (0.3 mL)
Child 6 months to 6 years:	150 micrograms IM (0.15 mL)
Child <6 months:	100–150 micrograms IM (0.1–0.15 mL)

The above doses are for IM injection **only**.
Intravenous adrenaline for anaphylaxis to be given **only by experienced specialists** in an appropriate setting.

3. IV fluid challenge

Use crystalloid

Adults: 500–1000 mL
Children: 10 mL/kg

Anaphylaxis

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Emergency

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Procedures

Setting up BiPAP (NIV) for acute hypercapnic respiratory failure

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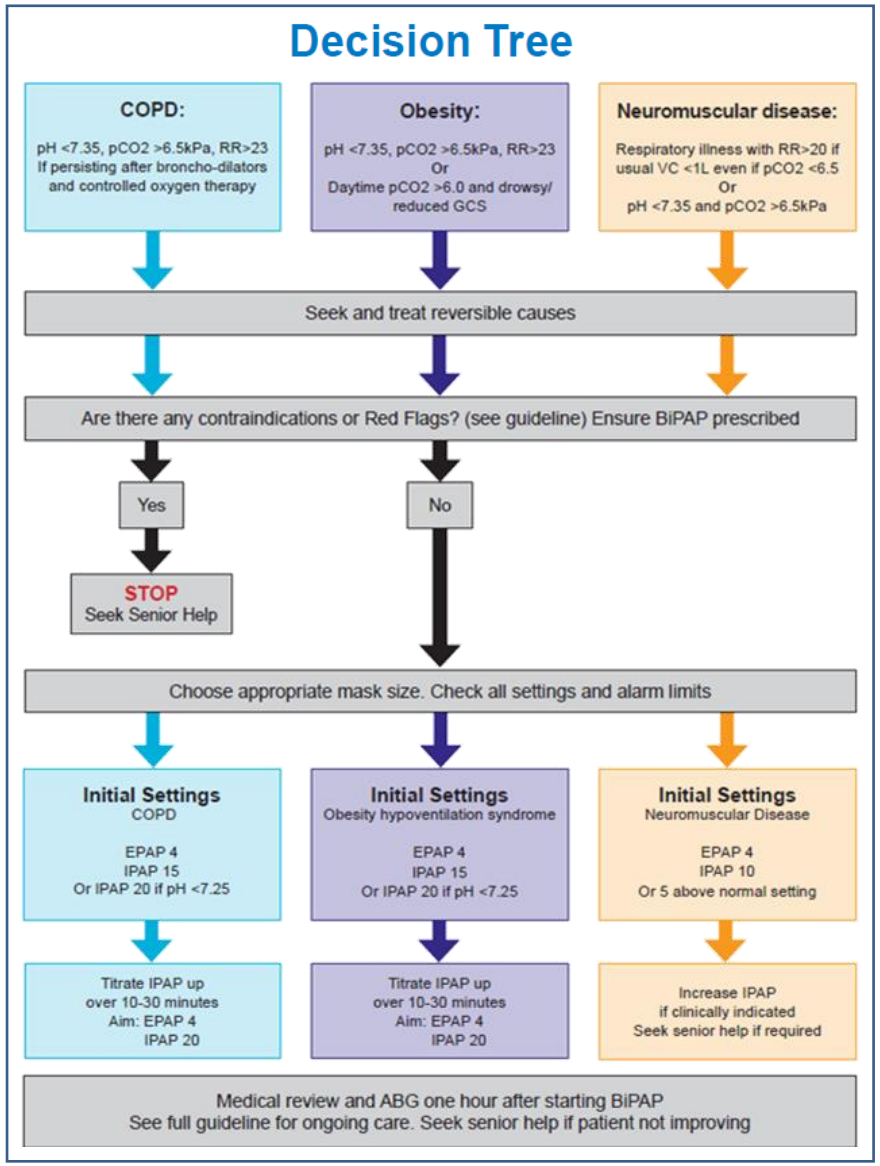
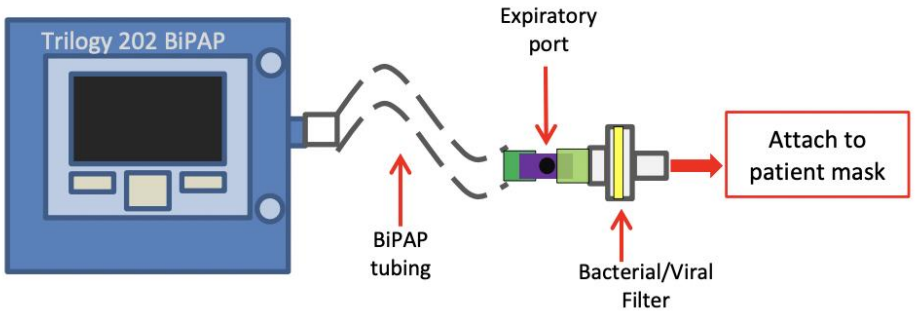


1. Is the patient suitable for BiPAP? – use full pathway to document, including escalation plan
2. BiPAP must be prescribed
3. Inform CCOT, Medical SpR and Respiratory team
4. Set up tubing with bacterial filter and expiratory port, as shown below



5. Choose correct mask size, protect nasal bridge with dressing
6. Check all settings and alarms BEFORE connecting patient
7. See BSUH Microguide for full BiPAP set up guidelines

BiPAP (NIV) exclusion criteria

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ABSOLUTE CONTRAINDICATIONS:

- Pneumonia
- Asthma
- Severe facial deformity
- Facial or upper airway burns
- Fixed upper airway obstruction

RELATIVE CONTRAINDICATIONS:

- Untreated pneumothorax
- Recent upper GI or craniofacial surgery
- Vomiting / aspiration risk (consider NG tube)
- Bowel obstruction (consider NG tube)
- pH ≤ 7.15 (or < 7.25 and additional adverse features)
- GCS ≤ 8, confused, agitated, cognitive impairment
- Suspected COVID-19 – see *NIV COVID Pathway*

INDICATIONS FOR ITU INPUT:

- Acute hypercapnic respiratory failure with impending arrest
- IV sedation
- Close monitoring
- Suspected difficult intubation (e.g. obese, MND)
- Suspected COVID-19

Management of Spontaneous Pneumothorax

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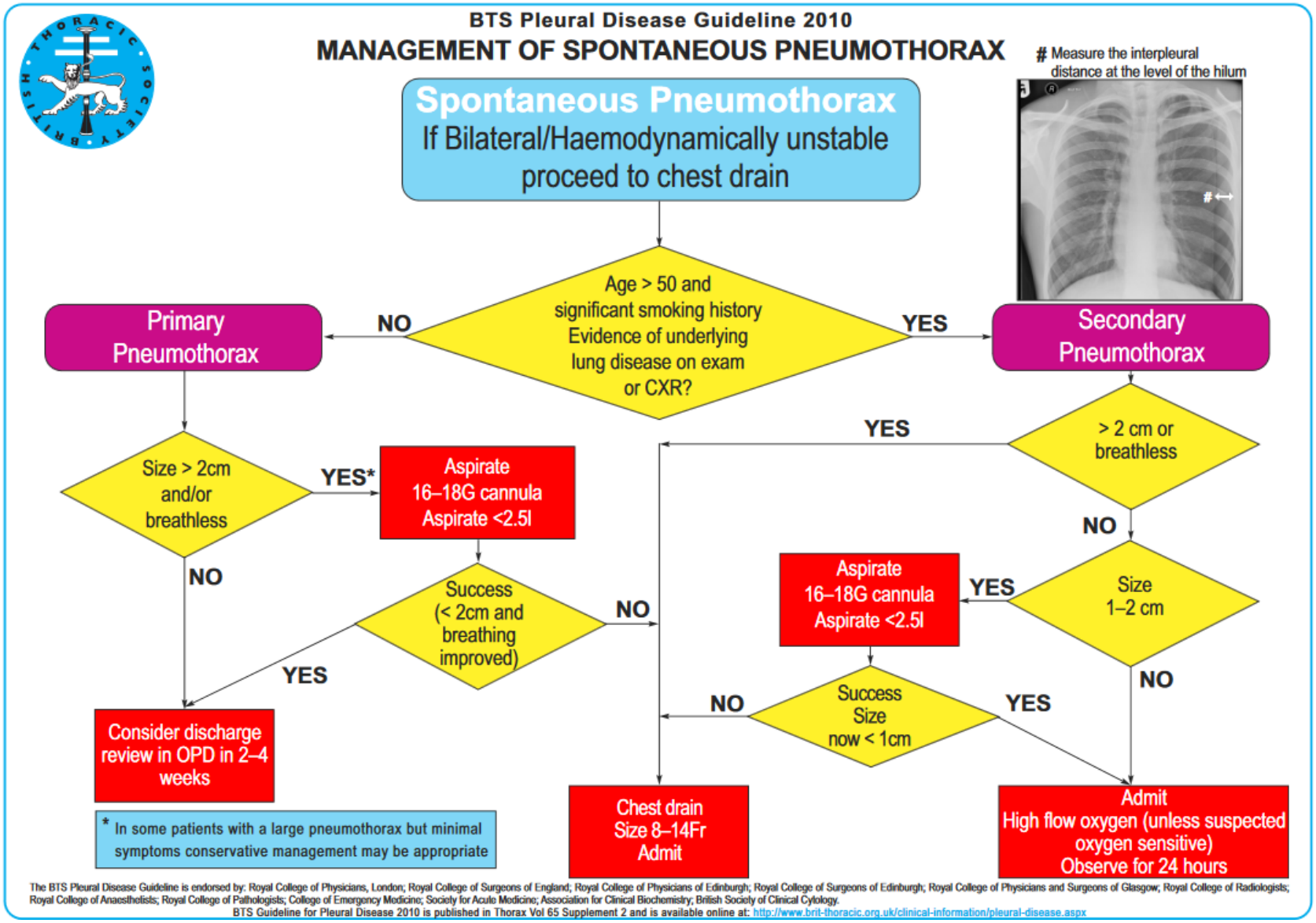

Fascia Iliaca Block – Landmark technique

University Hospitals Sussex NHS Foundation Trust

1	Fractured neck of femur proven on X-ray
2	Gain consent and check no contraindications
3	Prepare kit (FIB box found in department) using aseptic technique
4	Position patient correctly and ensure adequate assistance and monitoring
5	Identify insertion point: • Identify ASIS and pubic tubercle • Divide into thirds • 1 cm below junction between middle and outer third • Palpate femoral artery to ensure insertion point is lateral
6	Clean skin and inject 1 mL of lidocaine to form a bleb
7	Use a blunt needle: through skin, bounce, pop, bounce, pop
8	Aim cephalad, aspirate, check not near femoral artery, inject bupivacaine (there should be no resistance)
9	Document procedure (sticker available) • Record observations (5, 10, 15 & 30 mins)

Contraindications:

- Severe dementia
- Unconscious
- INR > 1.5
- Allergy to local anaesthetic
- Infection area overlying site of injection
- Previous femoral bypass surgery

Safe doses/max doses:

- 0.25% bupivacaine
- 2.5 mg/mL
- Safe maximum dose = 2 mg/kg

- 0.5% bupivacaine
- 5 mg/mL
- Safe maximum dose = 2 mg/kg

See local anaesthetic dosing chart overleaf

Fascia Iliaca Block – Landmark technique – Local Anaesthetic Dosing Chart

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	Maximum dose (mg/kg)	Maximum volume (mL)						
Weight		**35 kg**	**40 kg**	**45 kg**	**50 kg**	**60 kg**	**70 kg**	**80-100 kg**
0.25% bupivacaine	2	28	32	36	40	48	56	60
0.5% bupivacaine	2	14	16	18	20	24	28	30
1% lidocaine	3	10.5	12	13.5	15	18	20	20
2% lidocaine	3	5.25	6	6.75	7.5	9	10	10

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Emergency

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Medications

Aminophylline Infusion

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1	For use in patients with • Life threatening asthma • Non-responder to nebulisers

Aminophylline injection **should not be used** in patients hypersensitive to ethylenediamine or those allergic to the theophyllines, caffeine or theobromine.

2	Attach patient to a **cardiac monitor**
3	• Loading dose 5 mg/kg (usually 250-300 mg) • **Only if not on oral theophylline** - Uniphyllin Continus, Nuelin, Slo-Phyllin, Phyllocontin Continus **P.T.O. for Dosing and Infusion Rate Table**
4	• Add dose to 100 mL of 5% glucose or 0.9% sodium chloride and • Give by infusion over AT LEAST 20 minutes
5	**Maintenance Infusion** used in acute severe asthma or severe exac. of COPD. Maintenance infusion = P.T.O. for dosing table • Dilute to aminophylline 1 mg in 1mL with 0.9% sodium chloride or glucose 5% **P.T.O. for Dosing and Infusion Rate Table**
6	Check levels 4-6 hours after starting treatment
7	Check potassium levels regularly • Concomitant use with beta 2 agonists can potentiate hypokalaemia

Aminophylline Dosing and Infusion Rate

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Dose calculated by **Ideal Body Weight in obese patients (BMI ≥30)**:

50 kg (Male) OR 45 kg (Female) + 2.3 kg for every INCH over 5 feet

Aminophylline Dosing and Infusion Rate table							
Dose Aminophylline	**40kg**	**50kg**	**60kg**	**70kg**	**80kg**	**90kg**	**100kg**
LOADING DOSE 5mg/kg over 20 minutes	200mg	250mg	300mg	350mg	400mg	450mg	500mg
Infusion Rate for MAINTENANCE DOSE							
Elderly or heart failure: 0.3mg/kg over 24hours	12mL/hr	15mL/hr	18mL/hr	21mL/hr	24mL/hr	27mL/hr	30mL/hr
Non-smoking adult: 0.5mg/kg over 24hours	20mL/hr	25mL/hr	30mL/hr	35mL/hr	40mL/hr	45mL/hr	50mL/hr
Smoking Adult: 0.7mg/kg over 24hours	28mL/hr	35mL/hr	42mL/hr	49mL/hr	56mL/hr	63mL/hr	70mL/hr

Monitor levels 18 hours after treatment. Aim for serum level 10-20mg/L Do not adjust the dose/frequency if this first level is between 8-10mg/L. Take care with interacting medication e.g. erythromycin and clarithromycin, ciprofloxacin.

Detailed advice is available from the pharmacy department. If IV theophylline continues for more than 24 hours start monitoring levels – stop infusion for 20 minutes before taking levels

Dobutamine Infusion

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1	Used for positive inotropic support in cardiac decompensation due to low output cardiac failure e.g. myocardial infarction, cardiogenic shock, heart failure.
2	Attach patient to cardiac monitor with BP monitoring (arterial line required)
3	• Use the ready diluted 250mg/50mL preparation • Central administration preferred due to low pH, but may also be given via a large peripheral vein (use more dilute solution if possible, for example 250 mg/250mL). Concentrations greater than 1 mg/mL via central line only.
4	The rate of administration and the duration of therapy should be adjusted according to the patient's response as determined by heart rate, blood pressure, urine flow, and if possible, measurement of cardiac output.
6	**Dose calculation:** mg required/hour = $\frac{\text{dose (micrograms/kg/min) x weight (kg) x 60 (minutes)}}{1000}$ Infusion rate = $\frac{\text{mg required/hour x infusion total volume of solution prepared}}{\text{Number of mg in prepared solution}}$
7	**For example:** Infusion rate for 250mg/50mL solution for 80 kg patient at rate of 5 micrograms/kg/min: mg required/hour = $\frac{\text{5 micrograms/kg/min x 80 kg x 60 (minutes)}}{1000}$ = **24 mg/h** Infusion rate = $\frac{\text{24 mg/h x 50 mL}}{\text{250 mg}}$ = **4.8 mL/h**

Dosing table for dobutamine 250mg/50mL

Weight (kg)	Infusion rate calculated from Dose (microgram/kg/min) which provides m/l hour infusion rate			
	2.5 microgram	**5.0 microgram**	**7.5 microgram**	**10 microgram**
50	1.5ml/hr	3.0 ml/hr	4.5 ml/hr	6.0 ml/hr
55	1.65 ml/hr	3.3 ml/hr	4.95 ml/hr	6.6 ml/hr
60	1.8 ml/hr	3.6 ml/hr	5.4 ml/hr	7.2 ml/hr
65	1.95 ml/hr	3.9 ml/hr	5.85 ml/hr	7.8 ml/hr
70	2.1 ml/hr	4.2 ml/hr	6.3 ml/hr	8.4 ml/hr
75	2.25 ml/hr	4.5 ml/hr	6.75 ml/hr	9.0 ml/hr
80	2.4 ml/hr	4.8 ml/hr	7.2 ml/hr	9.6 ml/hr
85	2.55 ml/hr	5.1 ml/hr	7.65 ml/hr	10.2 ml/hr
90	2.7 ml/hr	5.4 ml/hr	8.1 ml/hr	10.8 ml/hr
95	2.85 ml/hr	5.7 ml/hr	8.55 ml/hr	11.4 ml/hr
100	3.0 ml/hr	6.0 ml/hr	9.0 ml/hr	12.0 ml/hr

Glucagon Infusion

University Hospitals Sussex NHS Foundation Trust

For use in beta-blocker overdose only where there presence of any of:

- Severe hypotension
- Heart failure
- Cardiogenic shock

Initial bolus:

- 5-10 mg IV undiluted over 1-2 mins

Preparation of infusion:

- Remove 25 mL from a 250 mL bag of 5% glucose
- Add 25 pre-filled syringes of 1mg in 1 mL glucagon (found in resus fridge)
- This gives 25 mg of glucagon in 250 mL of 5% glucose (0.1% solution)
- The on-call pharmacist may need to be contacted to obtain the required amount of pre-filled syringes

Infusion:

- Commence at a rate of 1-5 mg/hour (10-50 mL/h)
- Titrate according to patient's response (do not 10 mg/hour)

Monitor for side effects:

- Vomiting (consider prophylactic treatment with an anti-emetic)
- Hyperglycaemia
- Hypokalaemia
- Hypocalcaemia

Labetalol Infusion

NHS
University Hospitals Sussex
NHS Foundation Trust

For use in Malignant Hypertension

- BP ≥180/120
- Target to reduce diastolic BP to 100-110 mmHg over 6 hours
- Maximum decrease of 25% from baseline in 24 hours

Preparation:

- Remove 90 mL from a 250 mL bag of 5% glucose
- Add 2 ampules of 100 mg/20mL labetalol (i.e. 200 mg = 40 mL)
- You will now have 200 mg of labetalol in 200 mL of 5% glucose

Infusion:

- Commence at a rate of 15 mg/hour
- Titrate up by 10-15 mg every 30 minutes to achieve desired aims as stated above.
- Max 120 mg/hour

Naloxone Usage & Infusion

NHS
University Hospitals Sussex
NHS Foundation Trust

1	**Suspected opioid overdose with a RR <10:** • Give 400 micrograms bolus of naloxone IV • Naloxone can be given IM but effect is delayed • Repeat dose every 2 minutes until RR >10
2	Consider an ABG to ensure patient does not have respiratory acidosis due to CO_2 retention. Capnography is also useful here.
3	**Naloxone infusion for partial response and to maintain RR >10:** • Starting dose = 60% of the dose required to obtain RR >10 1. Calculate the dose required to obtain RR >10 and multiple this by 6 2. Add this dose of naloxone to 1 L of 0.9% Saline 3. Infused at a rate of 100 mL/hour
4	**Example:** • If 400 micrograms is required to maintain RR >10 • 400 micrograms X 6 = 2400 micrograms → add this to 1 L 0.9% saline • Here an infusion of 100 mL/h provides a dose of 240 micrograms/hour (60% of dose required to maintain RR >10)
5	Slowly decrease the infusion over 2-3 hours. Stop when RR remains stable. On discharge dispense naloxone mini-jets to known IVDUs (drug cupboard in 2a)

Octaplex for Warfarin Reversal in Life Threatening Bleeding

NHS University Hospitals Sussex NHS Foundation Trust

Indications

1. Cerebral haemorrhage in patients taking warfarin
2. Major bleeding requiring transfusion in patients taking warfarin
3. Urgent reduction of anticoagulation before emergency (NOT elective) surgery in patients taking warfarin

Relative Contraindications

1. Known allergy to PCC (Prothrombin Complex Concentrate)
2. Heparin-induced thrombocytopenia or known allergy to heparin
3. Risk of thrombosis: angina pectoris, recent myocardial infarction/stroke, recent thrombosis (PE/DVT) within 4 weeks, patients with prothrombotic conditions such as antiphospholipid syndrome, disseminated intravascular coagulation, mechanical valves (except in life-threatening haemorrhages following over dosage of warfarin).
4. Liver disease (decompensated)

In cerebral haemorrhage or major bleeding (indication 1&2) if no contraindication **DO NOT** wait for INR prior to commencing Octaplex

- Calculate the dose assuming an INR of 2 and amend once the INR result is known:
- INR 1.4–1.9, continue as if the INR was 2.0
- INR is <1.4 consider stopping the infusion.
- INR is >2, give the extra iu required to make up the total dose.

1	• If indication met and NO contraindication proceed below • If contraindication contact heamatology SpR on bleep #8472 09:00-17:00. OOH contact consultant haematologist via switchboard
2	Send coagulation sample to the lab
3	Weigh/Estimate patient's weight and use table to calculate dose
4	Call transfusion lab *RSCH ext. 4711/bleep #8286, PRH ext. 6103/bleep #8221* to authorise and supply Octaplex
5	Prescribe Octaplex on blood product page of drug chart (effects last approx. 6-8 hours)
6	Call porters to collect from lab when ready
7	Administer Octaplex. Each vial reconstituted with 20 mL of water for injection
8	Give IV starting 1 mL/min, increasing to max 2-3 mL/min. Monitor for tachycardia
9	Give 5–10 mg of IV vit K, onset of action 4-6 hours (avoid in antiphospholipid syndrome and metallic valve)
10	Repeat INR 60 mins post Octaplex administration to ensure INR normalised

Octaplex Dosing (Max dose 3000 iu)

Approximate doses required for normalisation of INR (≤1.2 within 1hr) at different INR levels:

Weight (kg)	INR 2-2.5	INR 2.5-3	INR 3-3.5	INR >3.5
50	1500 iu	2000 iu	2500 iu	2500 iu
60	2000 iu	2000 iu	2500 iu	3000 iu
70	2500 iu	2500 iu	3000 iu	3000 iu
80	2500 iu	3000 iu	3000 iu	3000 iu
90	2500 iu	3000 iu	3000 iu	3000 iu
100	3000 iu	3000 iu	3000 iu	3000 iu

Life threatening bleeding with DOAC

- Contact haematology SpR in hours or consultant OOH
- Octaplex dose 50 iu/kg for reversal of anti Xa drugs
- Idarucizumab used for the reversal of Dabigatran

Riastap (Fibrinogen Concentrate)

NHS
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Equipment

- 50 mL syringe
- 50 mL sterile water and needle
- Wide bore spike
- 1 gram of Riastap

Preparation

1. Use aseptic technique
2. Draw up 50 mL of sterile water
3. Use wide bore spike to mix with 1 gram of Riastap
4. Roll the bottle DO NOT SHAKE

Administration

Give as a bolus over 3-5 minutes

Complete traceability slip and return to blood bank

- Human derived source of fibrinogen
- 6 grams (6 bottles) of Riastap is equivalent to 3 bags of cryoprecipitate
- Stored below 25 degrees Celsius
- If unused return to blood bank

Salbutamol Infusion

NHS
University Hospitals Sussex
NHS Foundation Trust

1	Clinical decision to start IV salbutamol by senior SpR or consultant as other therapies not worked
2	Salbutamol IV comes in 500 microgram in 2 mL
3	Dilute with 10 mL of water for injection • To give a concentration of 50 microgram/mL • Administer 250 micrograms (5 mL) IV over 3-5 minutes
4	Repeat 250 microgram bolus if required **OR** start infusion:
5	**Preparing infusion:** • Add salbutamol 5 mg in 5 mL to 500mL of 5% glucose • Giving a concentration of 10 microgram/mL • Start infusion at 300 micrograms/hour (30 mL/hour) • Adjust rate of infusion according to response and heart rate • Normal dose 180-1200 micrograms/hour (a rate of 18-120 mL/hour)
6	• Monitor for **tachycardia** • **Check potassium** levels every 1-2 hours whilst infusion running

Starting Vasoactive Medications (Ionotropes/Vasopressors) (adults only)

University Hospitals Sussex NHS Foundation Trust

1	ED Consultant or ITU SpR/consultant requests inotropes for use in resus
2	Do you have a **patent dedicated CENTRAL line lumen** for inotrope administration?
3	Does the patient have an arterial line? Is CVC correctly sited? (see CVC insertion prompt card on intranet)
4	Ensure the dedicated lumen is primed with infusion double swan lock connector
5	ALWAYS use dedicated **ALARIS PUMP** (2 in ED resus)
6	How to make up vasopressors: • **Noradrenaline** 4 mg + 46 mL of 5% dextrose = total volume of 50 mL • **Adrenaline (1 in 1000)** 4 mg + 46 mL of 5% dextrose = total volume of 50 mL
7	Bleep **ITU SpR** (RSCH 8413, PRH 3010) and **Critical Care Outreach Team** (RSCH 8495, PRH 6331) if not already present before starting the infusion
8	Critical Care Outreach can advise/help with **double pumping** vasopressors if there is an expected delay before ITU transfer. Outreach Bleep RSCH 8495 (8am-8pm), PRH 6331