Brighton and Sussex University Hospitals NHS Trust

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 BSUH:

Dr Iona Griffiths– Clinical Fellow – iona.griffiths2@nhs.net

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Version 5 **Introduced April 2019** **Next Review April 2020**

Contents Page

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Contents Page

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Prompt cards can be used by all members of the Emergency Department Team. If used correctly they will improve patient safety and reduce human factor errors.

Emergency Bleep List

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ED Cons	4219
ED shift leader	62037
Anaesthetics SHO	8235
Anaesthetics SpR	8224
Cardiology SpR	8850/62045
Cardiothoracic SpR	62047
Critical Care Outreach	8495
ENT SHO	8619
ENT SpR	Switchboard
General Surgery SHO	8614
General Surgery SpR	8613
ITU SpR	8413
Max Fax SHO	8787/switchboard
Max Fax SpR	Switchboard
Medical Consultant	ext 3232
Medical SpR	8521
Medical SHO	8520
Neurosurgery SpR	Ext 62032
Orthopaedics SHO	8471
Orthopaedics SpR	8629
Obstetric SpR	8612
Radiographer	8299/4179
Radiographer CT	8800
Radiology SpR	Ext 62046
Renal SpR	8031
Vascular Surgery SpR	8004/switchboard
CEPOD Co-ordinator	8061
Site manager	8152
Medical Bed manager	8284
Surgical Bed manager	8300

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Emergency

Promp+ Cards

Trauma, Briefings and Transfers Section

Trauma/ASHICE Briefing and Preparation

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S	**Staffing** Introductions, sign in, name stickers and personal protective equipment
P	**Patient Details** Pre-hospital information relayed to team. Collect pre registration details from reception.
O	**Organise** Assign roles (Box 1), medications pre-drawn (analgesia, anti-emetics, tranexamic acid.) Equipment checking (by relevant team members) and consideration of code red and/or specialist teams if not already present
R	**Reception of patient-** lookout posted outside, logistics of transfer, **immediate needs addressed**, SECAmb/HEMS handover, blood forms printed, imaging requested
T	**Treatments** Identification of further procedures such as intubation/chest drain/catheter etc.

Box 1: Prepare Team members:

- Team Leader (ED Consultant)
- Anaesthetist & ODP
- Primary Assessment Doctor
- Nurse (2 if available)
- Procedures Doctor
- Scribe
- IV Access & Bloods
- Porter
- Liaison with relatives

Prepare Equipment:

- Monitoring
- Oxygen
- Yellow Scoop
- IV access and bloods tray
- Fluids
- Bag valve mask
- Working suction
- Tagged Ventilation bag
- Tagged Intubation bag
- Intubation drugs
- Difficult airway trolley
- Bougie
- IO gun
- USS Machine
- LUCAS if required

Trauma Imaging and Interventional Radiology

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1	Clinical signs or a mechanism of injury suggesting a possible **solid organ or pelvic injury**?
2	**Obtain full CT Traumogram and radiologist report (Radiographer RSCH:8299 PRH: 6157/8034 Radiologist: 62046)**
3	**Is there CT evidence of:** - Hepatic, Renal or Splenic Injury with active arterial bleeding or significant haematoma? - Pelvic Injury (without or without fractures) with active arterial bleeding or significant haematoma? - Aortic Dissection or Transection?
4	**Contact consultant interventional radiologist on call via switchboard and ensure immediate surgical review has been requested**
5	**The decision to undertake embolisation will depend on:** - Grade and position of injury - Patient stability and estimated blood loss - Surgical opinion and potential alternative (especially in high grade injuries)
6	**If a decision is made to embolise for haemorrhage control:** **Refer to prompt cards 3 and 4 for preparation for transfer to the IR Suite (Theatre 6)** **Seek anesthetic support in all cases**

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Pre-Transfer Checks – TO BE READ ALOUD

Name of person leading clinical care?

1	**SAFE for Transfer?** → Based on A.B.C.D.E. assessment in the last **5 minutes**? → If intubated has patient had enough sedation +/- paralysis → Are appropriate airway management skills present?
2	Get **TRANSFER EQUIPMENT** → Green transfer bag, working suction, drugs, monitoring → Set alarm limits → Ventilator checked → Adequate battery life for portable equipment?
3	**ON OXYGEN?** → Do you have enough for transfer? → Once on cylinder O_2, **REPLACE** the **FLOW METER TO THE WALL**
4	**PLAN YOUR ROUTE** Does someone need to go ahead to clear corridors/hold lifts?
5	**DESTINATION** ready? – (Inform ITU/HDU 15 minutes in advance) → For CT then contact Radiographer (bleep 8800) [PRH – 6157] → For X-ray then contact Radiographer (RSCH X-Ray ext 4242) → Ensure you have enough staff to move/log roll patient → Ensure IV cannula is sited and flushed for contrast.
6	***If all team members are in agreement then commence transfer***

REVIEW DUE APR 2020 VERSION 5.0 IMPLEMENTED APR 2019

Arrival Checks

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1	**Arrival at destination:** → Plug oxygen into the wall at the earliest opportunity → At CT then plug equipment into the wall and ensure monitoring is visible → At ITU/HDU then ensure team at bedside ready to receive; leave portable equipment on initially
2	**Reassess Patient:** → Re-assess A.B.C.D.E including observations and capnography on portable monitor → Ensure patient stable enough for scan → Allow anaesthetist and nurse to establish ICU ventilation if this is destination
3	**Staff:** Do you have enough staff to log roll the patient for scan?
4	**Moment of silence:** Team introductions, clarify lead, verbal handover, roles assigned for transfer
5	**Transfer of patient:** ITU/HDU nurse to establish monitoring and doctor to review

Management of Severe Burns

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A	**Airway – Suspect inhalation injury** • Respiratory Distress • Stridor • Wheeze • Voice Change • Deep Facial Burns (sit patient upright) • Sooty Sputum • Patient has been in an enclosed space • LOC at scene Seek anesthetic assessment for consideration of early intubation
B	**Breathing – Suspect CO/ cyanide inhalation** • Base line arterial Gas (COHb) • Check oxygen saturations • Administer 100% FiO2
C	**Circulation** • Bilateral Large bore cannula (away from burnt tissue is possible) • FBC, U&E, LFT, CRP, Amylase, CK, cross-match, Drug/Tox as needed
D	**Disability** • IV opiate analgesia and titrate to pain
E	**Exposure** • Remove non adherent clothing, jewelry • Cool wounds with wet compress/running water 20 minutes • Clean with 0.9% saline or tap water • Assess %today body surface area with Lund and Browder chart • Cover with loose Clingfilm – do not put on face **Refer with photos via www.trips.nhs.uk and discuss on 01342 414440**

Burns Estimations and Considerations

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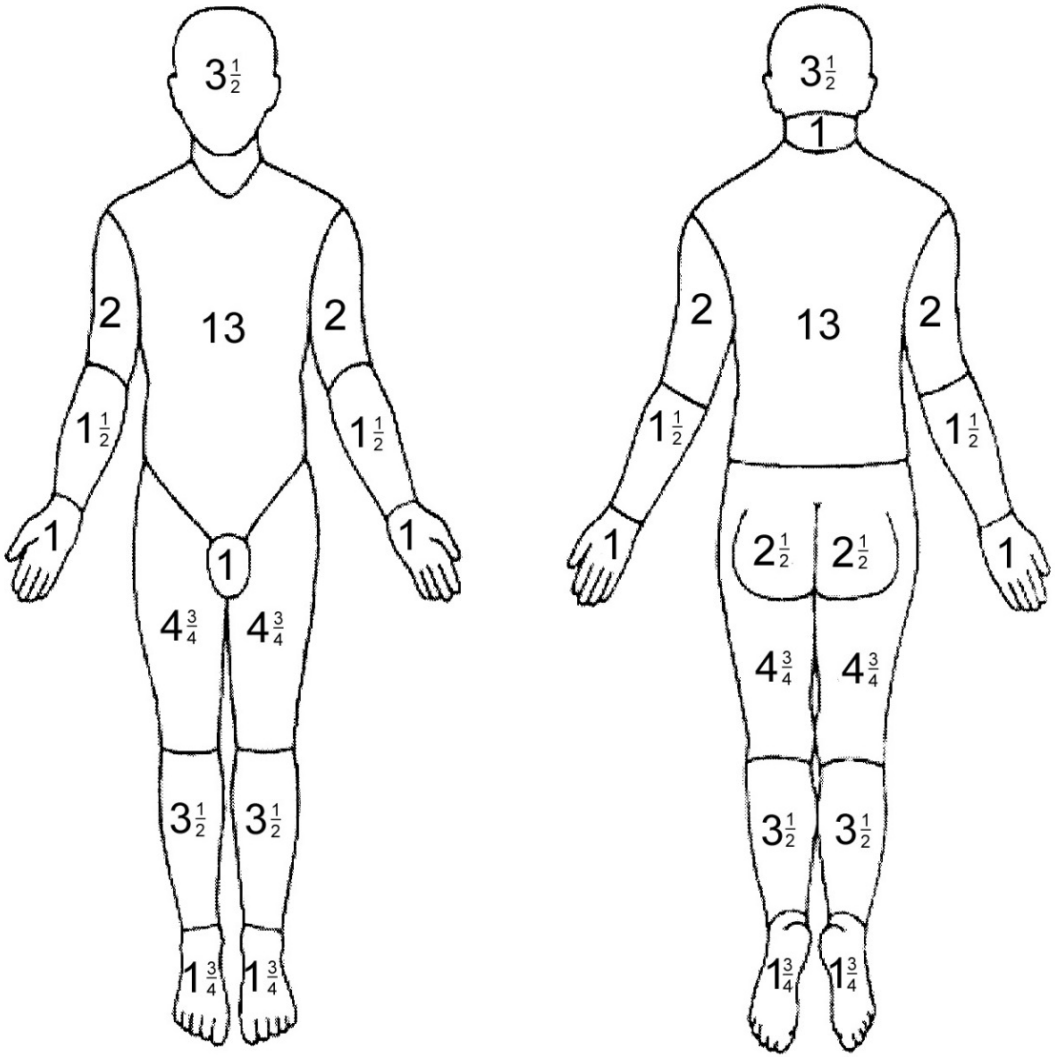

Have you considered?

→ Discuss with East Grinstead
→ NG Tube
→ Escharotomy to chest/neck for circumferential burns
→ Tetanus Booster
→ NBM
→ Safeguarding concerns

Fluids:

→4mls/kg/% burn
→Half over 8 hours
→Rest over 16 hours
→Warmed Hartmann's
→Catheterise
Urine Output
Adults 0.5-1ml/kg/hr
Children <30kgs 1ml/kg/hr
→Fluid balance chart

Thoracotomy in Trauma

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- Assign team member to call **Cardiothoracic Consultant** (switchboard)
- THEN fast bleep Cardiothoracic SpR (bleep 8490)

Request ED Thoracotomy Kit

Indications:

- Penetrating injury to chest or epigastrium resulting in cardiac arrest
- Non-head injury patient with significant haemorrhage below diaphragm

Contraindications:

- Definitive loss of cardiac output for more than 10 minutes
- Any patient with a cardiac output even if hypotensive
- Blunt truncal trauma (except if potential tamponade seriously suspected)

Perform **bilateral thoracostomies**

- 4cm incision in 5th intercostal space in the mid axillary line)
- Use spencer wells to puncture pleura
- Has this relieved tension pneumothorax and cardiac output returned? If so STOP HERE

Broad clamshell incision in the 5th intercostal space joining 2 thoracostomies with posterior extension to improve access;

- breach sternum with Tuff Cut Scissors/Gigli Saw

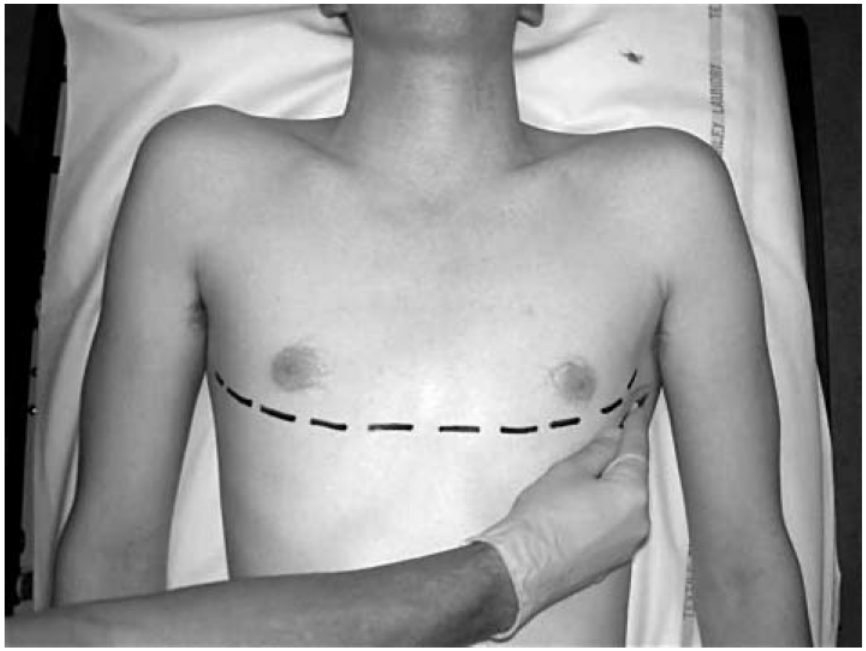
Open chest with suction ready. Open & evacuate pericardial sac.

Obtain **DIGITAL CONTROL OF BLEEDING** & consider:

- Suture of cardiac wound (4-0 Prolene on a 26mm needle)
- Packing/Foley Catheter
- Clamping or pressure for other identified sites of bleeding

IMPLEMENTED APR 2019 VERSION 5.0 REVIEW DUE APR 2020

Thoracotomy in Trauma



The clam shell incision.

Open chest. Rib spreaders in situ. Central heart. In this picture the pericardium has been displaced by internal cardiac massage and lies behind the heart. Gloved hand compressing the aorta.

Management of Chest Injuries

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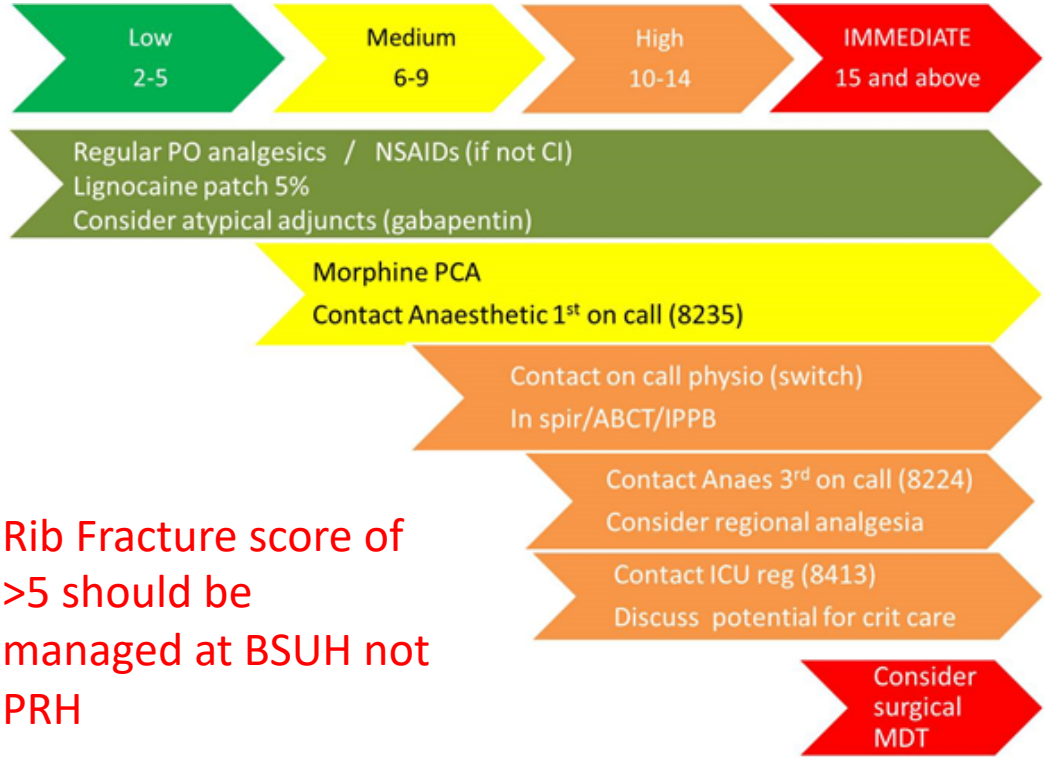
Step 1: Calculate Rib Fracture Score

(BREAKS x SIDES) + Age = Rib Fracture Score (RFS)		
BREAKS	SIDES	AGE
No. of fractures	Unilateral = 1	Less than 50 = 1
	Bilateral = 2	51 to 60 = 2
		61 to 70 = 3
		71 to 80 = 4
		More than 80 = 5

Step 2: Determine management plan



REFER TO CRTICAL CARE IF:

- **RFS 10 or more**
- **Flail chest or rib fractures with pneumothorax**
- **Clinical deterioration**
  - **SpO2 <94%, RR >30**
  - **FiO2 requirements 40% and/or increasing**
- **Presence of significant respiratory or cardiac disease**

Rib Fracture score of >5 should be managed at BSUH not PRH

Management of Chest Injuries

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Step 3: Prescribe appropriate analgesia

Liaise with anaesthetic team as required

Oral

- Paracetamol 1g qds PO/IV
- Ibuprofen 400mg tds (if not CI) +/- GI protection
- Lidocaine plaster 5%
- MST 5mg BD PO
- Oramorph 10-20mg PO PRN or Dihydrocodeine 30mg 4hrly PRN
- Consider Gabapentin 300mg

PCA

Morphine PCA 1mg bolus, 5min lockout

Daytime – pain team (8102)

OOH – anaes 1st on (8235)

- Paracetamol 1g qds
- Ibuprofen 400mg tds (if not CI)
- Lidocaine 5% plaster
- Gabapentin 300mg

If pain > 5/10

OR/AND

Unable to deep breathe/cough

Consider regional

Regional

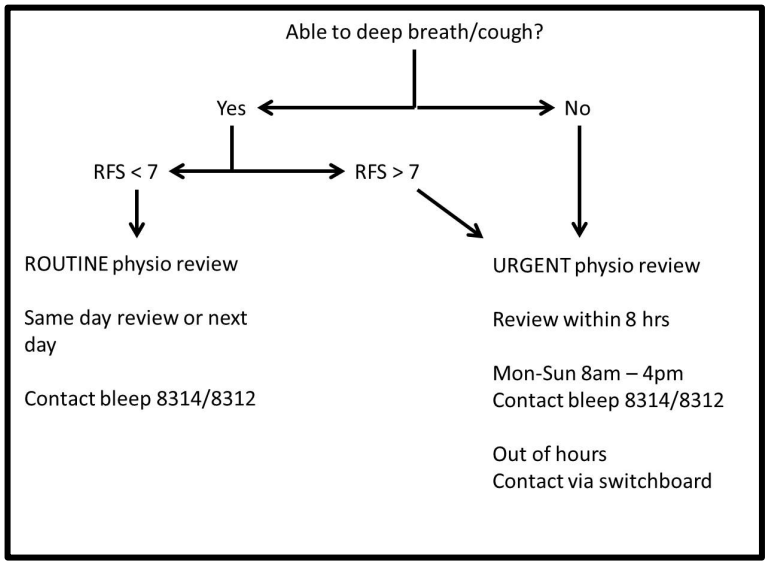
- Thoracic epidural/ paravertebral block
- Check INR/plat and CIs

Discuss with anaes 3rd on (8224) or Starred cons (8486)

Inform pain team

Suitable for Serratus Anterior catheter?

Step 4: Contact physiotherapy team for patients being admitted



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Emergency

Promp+ Cards

Medical Emergencies Section

Suspected Sepsis

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1	**Could this be sepsis?** • NEWS ≥5 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 • Suspects 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 FLAG

- Lactate ≥ 2
- Heart rate >130
- Altered mental state (V/P on AVPU)
- Systolic Blood Pressure <90mmHg
- Respiratory Rate >25
- Oxygen required to maintain SpO2 > 92% (88% in COPD)
- Urine – not passed in 18 hours or <0.5mLs/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

Treatment of Hyperkalemia

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Mild: 5.5-5.9mmol/L **Moderate:** 6-6.4mmol/L **Severe:** >6mmol/L

1	• Bloods: Bloods (U&Es, Mg^{2+}, HCO_3^-, CK) • ECG • If K >6mmol/L ensure cardiac monitoring
2	**If K >6.5mmol/L Or ECG changes give** • 10mL 10% Calcium Gluconate IV over 3 minutes
3	**Temporary reduction of K+** • 10 units of Actrapid Insulin in 50mL 50% dextrose IV over 15minutes • If K+ >6.5mmol/L this will only reduce K+ for 4 hours
4	**Consider:** • 10mg of nebulised salbutamol • Caution if IHD or tachycardic
5	If HCO_3^- <22mmol/L and not fluid overloaded give: • 500ml Sodium Bicarbonate 1.26% IV over 1 hour
6	**Monitoring:** BM every 30 minutes & **repeat K^+ level** at 1, 2, 4, 6 and 24 hours
7	If refractory ↑K^+ or if associated acute kidney injury (defined as a 1.5 x rise in creatinine and/or <0.5mLs/KG/Hour urinary output) Contact: **ITU SpR** (Bleep: RSCH 8413, PRH 6010), **Renal SpR** (bleep 8031)
8	**Review medications** (avoid: e.g ACEi, ARB, K^+-sparing diuretics & others)

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 50mg IV bolus • If no return of spontaneous circulation or improvement after 15 minutes • Give ALTEPLASE 50mg IV bolus • MAX 100mg ALTEPLASE
4	Obtain LUCAS in arrest/peri arrest situation from cardiothoracic Unit, L7a (ext 7289 or 4467)
5	**Thrombolysis In Stable Patient** • ALTEPLASE 10mg IV over 1-2 minutes • Then prepare an infusion of 90mg over 2 hours (if <65kg then give 1.5mg/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

Diabetic Ketoacidosis

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Diagnostic Criteria all 3 required
- Blood ketones >3
- Blood glucose >11mmol/L or known Diabetes (T1 and 2)
- Serum bicarbonate <15mmol/L AND/OR Venous pH <7.3

1	ABCDE assessment – assess severity
2	Prescribe IV fluids • 1L 0.9% sodium chloride over 1 hour
3	Prescribe IV fixed rate insulin infusion • 50 units of ACTRAPID in 49.5ml 0.9% sodium chloride • Rate of 0.1 units/kg bodyweight/hour
4	Continue long actin insulin at normal dose • Lantus/Glargine or Levimir/Detemir
5	Identify and treat causes • Infection • Missed insulin doses/poorly controlled DM • 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

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

Start 10% glucose when Blood sugar <12

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

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

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)** • PEF 33-50% best/predicted • RR ≥25/min • HR≥110/min • Inability to complete sentences in one breath **Life Threatening Clinical Signs** • Altered conscious level • Exhaustion • Arrhythmia • Hypotension • Cyanosis • Silent chest • Poor respiratory effort **Life Threatening Measurement** • PEF <33% best/predicted • SpO_2 <92% • PaO_2 <8kPa • 'normal' $PaCO_2$ (4.6-6 kPa)
3	**Immediate management** • Oxygen (maintain SpO_2 94-98%) • Salbutamol 5mg nebulised continuous • Ipratropium 0.5mg nebulised 4-6 hourly • Prednisolone 40mg-50mg / hydrocortisone 100mg
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 • 2g 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

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&E, 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

Acute Chest Pain Pathway

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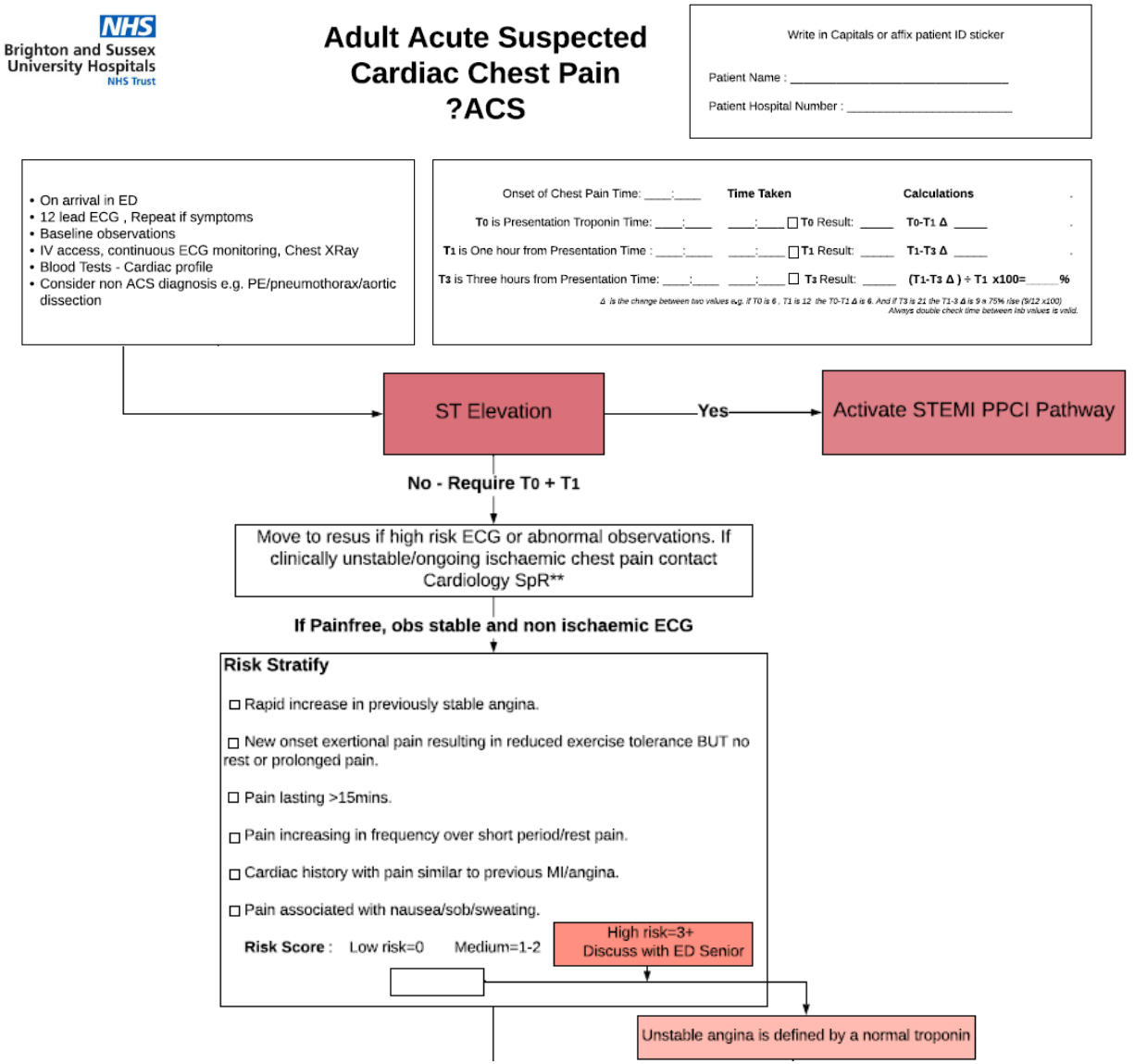

Acute Chest Pain Pathway

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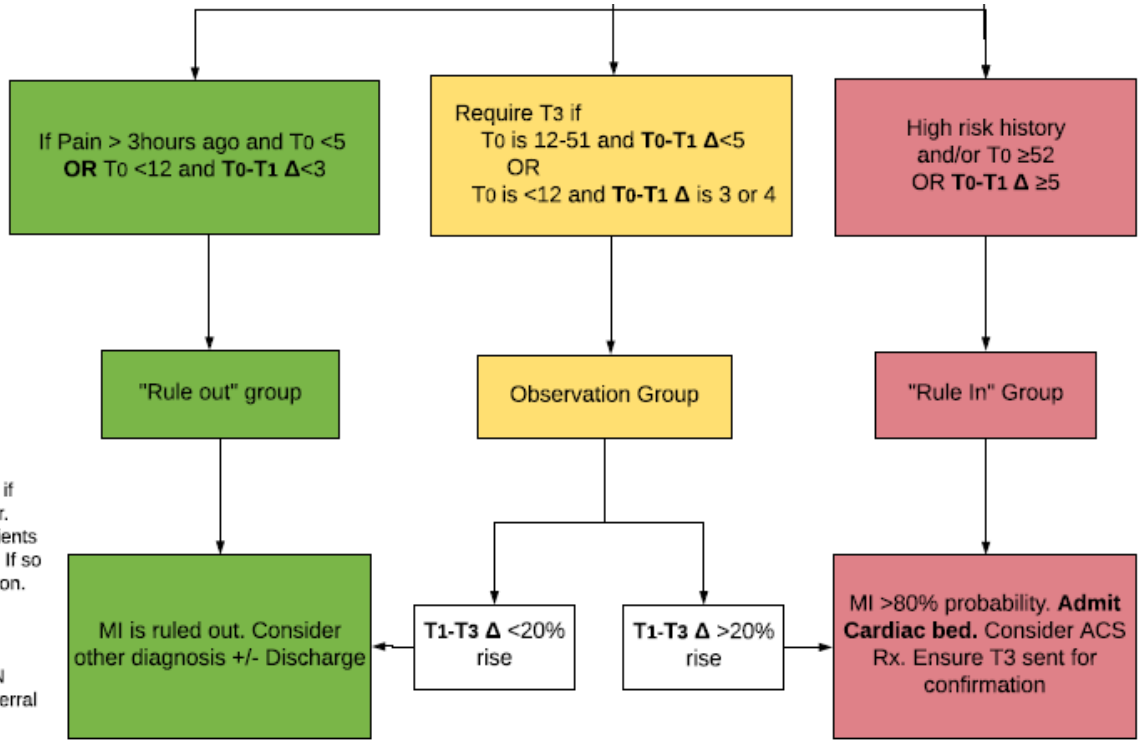

Discharge
Give appropriate advice if symptoms were to recur.
The RACPC is only for patients where angina is suspected. If so start appropriate medication.
Aspirin 75mg od
Bisoprolol/anti-anginal
Atorvastatin 40mg od
GTN spray 2puffs PRN
Complete online Panda referral form for RACPC

****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.

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 Diagnosis

Could this be CARDIAC TAMPONDE?
→ Examine and ultrasound

Could this be TENSION PNEUMOTHORAX?
→ Examine and ultrasound
→ If periarrest consider bilateral thoracotomies

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

Could this be RETROPERITONEAL BLEEDING?
→ Examine and ultrasound

CONSIDER PULMONARY EMBOLISM
→ See massive PE Prompt card

Management of PROLONGED SEIZURES/STATUS EPILEPTICUS

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Status Epilepticus is a life threatening medical emergency defined as;

- Seizure lasting ≥5 minutes

OR

- ≥ 2 seizures without return of consciousness

OR

- ≥ 3 tonic clonic seizures within 1 hours

Check BM and Treat if low and get senior help

1st stage 0-10 minutes

- Manage airway and contact anesthetics if concerns 8235
- Give oxygen 15L/min
- Gain IV Access and bloods (incl. Na, B-HCG, alcohol, drug levels)

Give

- Lorazepam 4mg IV bolus at 4-5 minutes

Alternative if no IV access

- Diazepam 10mg PR

If patients seizures resolve make management plan for

- Monitoring
- Treatment
- Infusions if required
- Determine cause

Ongoing seizure after 10 minutes give

- Second dose of Lorazepam 4mg IV (Unless cyanotic/hypoxic)

2nd Stage: antiepileptic drug therapy (after 2x 4mg dose of lorazepam)

- Phenytoin 20mg/kg IV infusion (on cardiac monitor)
- If already on phenytoin contact consultant – consider valproate or levetircetam

3rd Stage 30-60 minutes

- Contact anesthetics and ITU
- Organise imaging CT head and CXR

8
REVIEW DUE APR 2020
VERSION 5.0
IMPLEMENTED APR 2019

Drug Administration Guide in Status Epilepticus

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Lorazepam injection *Stored in fridge*	**Dose: 4mg** **Administration: IV bolus** over a few seconds, preferably into a large vein. Can be diluted with equal volume NaCl 0.9% or WFI. Flush with NaCl 0.9%
Diazepam emulsion and injection 10mg in 2ml	**Dose: 10mg** **Administration: Slow IV injection** (10mg over 2 minutes) into a large vein. Flush with NaCl 0.9% or WFI
Phenytoin injection *If patient weight is unknown, make an educated guess of patient's weight (see guide table below).* *ECG monitor during phenytoin administration*	**Dose: 20mg/kg** **Must not be faster than 50mg/min** **Administration:** **1. Intravenous infusion:** Dilute in sodium chloride 0.9% (max conc. 10mg/ml) and infuse into large vein at 50mg/min. Once diluted, ensure infusion given immediately. Flush before and after with normal saline. Observe regularly for white precipitate. Ideally use in-line filter 0.22 - 0.5 micron. **2. Slow IV injection**: Give undiluted into a large vein using a syringe pump. Flush before and after with NaCl 0.9%
Sodium valproate infusion	**Dose: 30mg/kg** **Episenta brand:** 300mg in 3ml solution for injection. **Epilim brand:** Dilute 400mg powder with 4ml WFI provided. **Administration:** Dilute dose in 50 or 100ml NaCl 0.9% and give at 20mg/minute.
Levetiracetam infusion	**Dose: 30mg/kg** **Adminstration:** Dilute in at least 100ml NaCl 0.9% or Glucose 5% and give over 15 minutes.

Phenytoin Infusion Dosing Guide: Based on approximate weight

Approx Pt Weight	< 70kg	70 - 90kg	>90 kg
Dose	1200mg	1600mg	2000mg
Phenytoin 250mg/5ml injection	24mls	32mls	40mls
Diluent volume	250mls NaCl 0.9%	250mls NaCl 0.9%	250mls NaCl 0.9%
Total volume (mls) Infusion rate (mls/min)	274mls over 24 minutes = 11.4 ml/min	282mls over 32 minutes = 8.8mls/min	290mls over 40 minutes = 7.25mls/min

Review following points before administrating Phenytoin

- Do you have patients correct weight?
- Have you sent a Phenytoin level?
- Have you used the correct diluent?
- What is the concentration of your final solution?
- Is the infusion rate correct?
- Is a filter in place?
- Are you infusing with an incompatible drug?
- Are you giving a loading or maintenance dose?
- Monitor for side effects

If in doubt, consultant with a pharmacist and/or local guidance

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 ≥7.5mg prednisolone OD (or equivalent dose of other steroids) for ≥3 weeks in the last 3 months

Precipitants

- Infection
- Dehydration
- Vomiting
- Diarrhoea
- Major Stress
- Trauma
- Stress

Diagnostic measures should not delay treatment, if suspected treatment should commence without delay

Closely monitor for biochemical abnormalities

- Hypoglycemia
- Hyponatraemia
- Hyperkalemia
- AKI

Immediate Management

→ Hydrocortisone 100mg IV/IM STAT (cont 50mg QDS regularly)

→ IV fluids 1L 0.9% NaCl in the first hour

→ Further IV hydration (4-6L 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.

Contact an Endocrinologist for urgent review.

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

Management of Malignant Hypertension
BP ≥180/120mmHg

Brighton and Sussex University Hospitals NHS Trust

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

Signs
- BP ≥180/120mmHg
- Grade III/IV retinopathy
- Retinal Haemhorrage/exudates
- Papillioedema

Consider Secondary Causes
- Intracranial Haemhorrage
- Aortic Dissection
- Acute Glomerulonephritis
- Phaemochromocytoma
- Renal Artery Stenosis
- Cocaine
- Eclampsia

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

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

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

→ GTN infusion as per trust protocol

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

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

Hypertensive Emergencies

Brighton and Sussex University Hospitals NHS Trust

TBC

Severe Pre- Eclampsia

Brighton and Sussex University Hospitals NHS Trust

Definition
- BP of ≥160/110 alone

OR
- BP <160/110 with 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, LFT's, Urate, INR, G&S
3	Treatment • Consider Labetalol unless history of steroid dependent asthma or obstructive airway disease (Nifedipine is the alternative)
4	Labetalol Dose → 200mg orally. Repeated every 30-60 mins if BP remains ≥170mmHg systolic IV labetalol indicated if unable to tolerate oral treatment OR no response → 20mg as an initial bolus (4mls of a 100mg/20mL vial) → Reassesment at 5 minutes → Repeat if BP ≥170/110mmHg → MAXIMUM DOSE OF 200mg

Features of severe pre-eclampsia:
- Severe Headache
- Blurred vision
- Vomiting
- Epigastric pain
- Clonus
- Papilloedema
- Tender liver edge
- Platelets <100
- Abnormal LFT's
- HELLP (Haemolytic anaemia, Elevated Liver enzymes, Low Platelets

↓

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

Speciality review is required before transfer

Eclamptic Seizures

Brighton and Sussex University Hospitals NHS Trust

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, LFT's, Urate, 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

Loading Dose	Maintenance Dose
4g $MgSO_4$ (8mls of 50% solution)	10g $MgSO_4$ (20mls)
Mixed with 12 ml N.Saline/5% Dextrose for injection	Mixed with 30mls water for injection to total volume 50ml
I.V over 5 mins	Infusion to run at a rate of 5mls/hour (1g/hour)

Initial management of Gastrointestinal Haemorrhage

Brighton and Sussex University Hospitals NHS Trust

1	Resuscitate Patient • ABCDE assessment
2	Gain bilateral large bore IV access • Send FBC, U&E, LFT's, Clotting, G&S
3	• Start IV fluids • Shocked patient 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 2mg IV (QDS) (1mg if ischemic heart/vascular disease) → Tazocin 4.5g IV → In penicillin allergic gentamycin and metronidazole
6	Consider PPI IV in all patients not just those with endoscopy delay
7	Aim Hb >70g/dL Unless advanced liver disease (jaundice, ascites, coagulopathy)
8	Calculate Glasgow Blatchford score
9	Early ITU/HDU review if poor response to initial resuscitation

Correct Clotting

- Stop anticoagulants
- Stop antiplatelet
- If on NOAC, contact haematologist
- If renal impairment contact renal team
- If platelets <50 arrange transfusion
- Vit K 10mg IV if liver disease
- Consider FFP
- If recent coronary stent <3 months or metallic heart valve – contact Cardiology

Endoscopy Referral

Brighton and Sussex University Hospitals NHS Trust

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.

Brighton and Sussex University Hospitals NHS Trust

EMERGENCY PROMPT CARDS

EMERGENCY LAPAROTOMY RISK ASSESSMENT

IS THIS PATIENT HIGH RISK?

1. MORE THAN 2 SIRS CRITERIA + ORGAN DYSFUNCTION

RR>20	WCC <4 or >12	+	SYSTOLIC BP<90 DESPITE FLUID BOLUS OR
Temp <36 or >38	HR >90		O2 NEEDED TO KEEP SP02 > 90%

2. LACTATE>2

3. NEWS>5

4. AGE>70 OR >50 + SIGNIFICANT COMORBIDITY

IF ANY OF ABOVE APPLY - INFORM A&E CONSULTANT.
SENIOR SURGICAL REVIEW/DISCUSSION WITHIN 30 MINUTES .

Brighton and Sussex University Hospitals NHS Trust

EMERGENCY PROMPT CARDS

EMERGENCY LAPAROTOMY MANAGEMENT PLAN

IF PATIENT ASSESSED AS HIGH RISK

A&E TEAM -

1. OXYGEN
2. LARGE CANNULA + FLUID RESUSCITATION PLAN (WITH FLUID BALANCE CHART AND URINARY CATHETER)
3. WITHIN 30 MINUTES - SENIOR SURGICAL REVIEW.
4. FBC/U&E/LFT/CLOTTING/G&S X2/LACTATE - DON'T FORGET AMYLASE
5. ANTIBIOTICS WITHIN 1 HOUR OF SEPSIS DIAGNOSIS

SURGICAL TEAM -

6. CHECK 1- 5 HAVE BEEN COMPLETED. (ANTIBIOTICS?)
7. WITHIN 2 HOURS - CT SCAN AND REPORT (STATE 'EMERGENCY LAPAROTOMY' ON FORM)
8. INFORM ANAESTHETIST (BLEEP 8224) AND OUTREACH (BLEEP 8495 RSCH or PRH 6331)
9. NEXT AVAILABLE SLOT ON EMERGENCY LIST (BLEEP 8061)
10. P-POSSUM MORTALITY RISK MUST BE DOCUMENTED (www.riskprediction.org.uk)

Emergency Laparotomy Risk Assessment

Brighton and Sussex University Hospitals NHS Trust

High Risk Criteria

2 or more of

- RR >20
- WBC <4 OR >12
- HR >90
- Temp <36 OR >38

And Organ Dysfunction

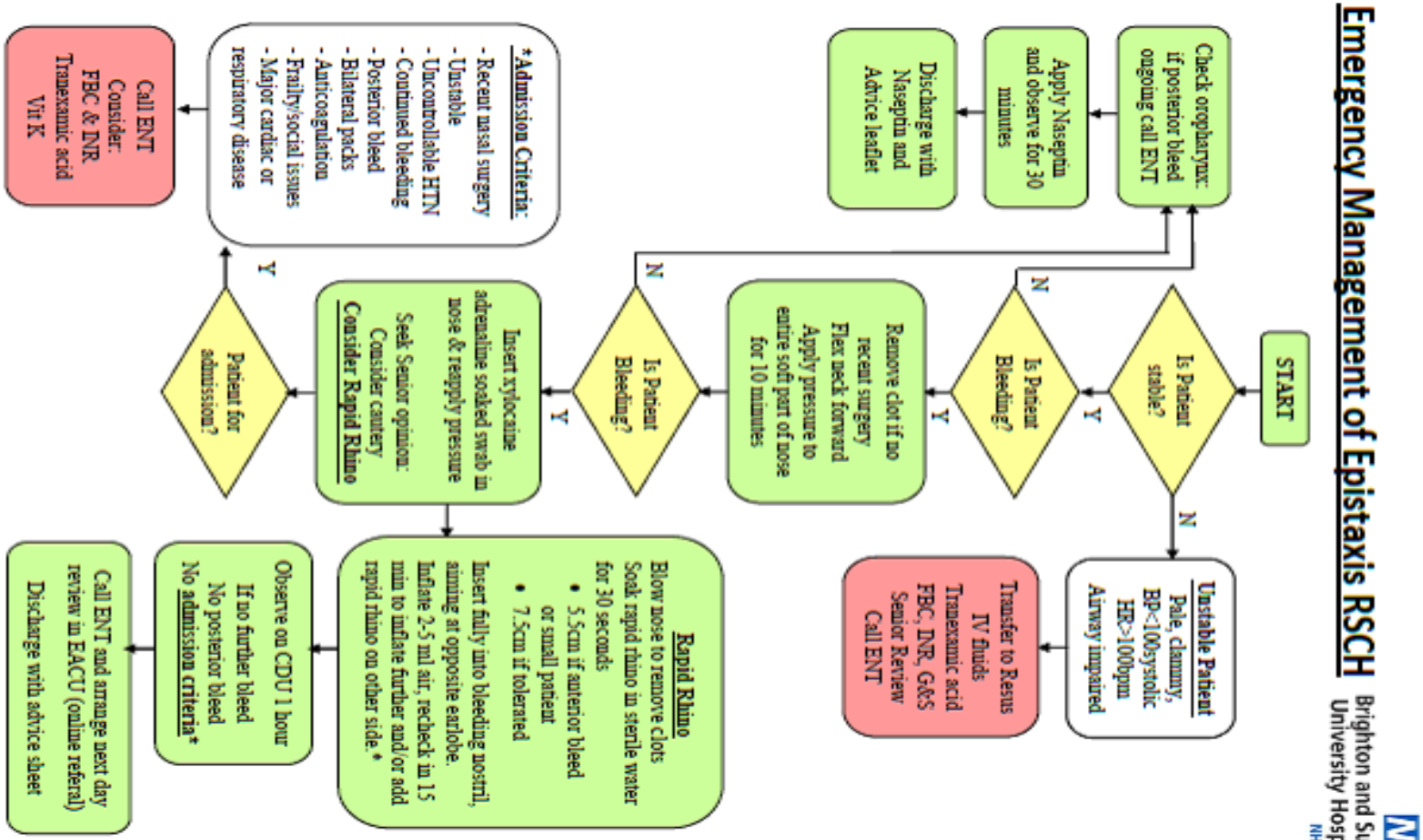
- Systolic BP <90 despite fluids
- Oxygen required to keep $SP0_2$ >90%

- 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 2X, 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 • Calculate and document P-Possum mortality score (www.riskprediction.org.uk)

Emergency Management of Epistaxis

Brighton and Sussex University Hospitals NHS Trust



General Approach to Managing Overdose

Brighton and Sussex University Hospitals NHS Trust

A	Assess airway Contact Anesthetic team if required
B	• **RR** – If depressed and suspicious for opioid toxicity consider Naloxone 400mcg initial dose (see Naloxone prompt card) • **O2 saturations** – Aim saturations 94-98% in all patients • Carbon monoxide poisoning suspected- High flow Oxygen (15L non-re-breather mask)
C	• **BP** – Hypotensive 250ml - 500ml 0.9% NaCl IV boluses, assess response. • Hypertensive + tachycardia – consider Beta blockers • **HR** – Bradycardic - 500mcg atropine / external pacing. • For tachyarrhythmia - consider Metoprolol 2.5 – 5mg IV, consider magnesium sulphate 2g IV • **VBG / ABG** – If elevated lactate give IV fluids, and replace electrolytes as appropriate • **Venous bloods** – Toxicology screen, paracetamol / salicylate levels, U+E's, LFT's, coagulation, FBC • **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 5-10mg PO / Lorazepam 1-2mg IV, titrate according to response – for anxiolysis **NOT** sedation • **Pupils** – Useful in determining Toxidrome (see Toxidrome prompt card) • **BM** – For severe hypoglycaemia give 150ml 10% Dextrose or 75ml 20% Dextrose IV over 10mins • **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.

Drug Overdose - Toxidromes

Brighton and Sussex University Hospitals NHS Trust

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	Hypervigilanve, agitation, hallucinations, coma Dry, flushed skin, dry mucous membranes, decreased bowel sounds, urinary retention, myoclonus, seizures (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 Hypo-reflexia, pulmonary oedema, needle marks	Opioids e.g. heroin, morphine, methadone, oxycodone
Sedative / Hypnotic	• Temp • HR • RR • BP 	Miosis / Mydriasis	CNS depression, confusion, coma Hypo-reflexia	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,

Post Exposure Prophylaxis (PEP)

Brighton and Sussex University Hospitals NHS Trust

Ensure all discussions, prescriptions and dispensing is with maximum privacy

Indicated when potential high risk exposure in the last 72 hours
- Ideally to start within 24 hours of exposure

Complete the relevant referral form of the intranet. Search 'PEP'

Complete up to date PEP proforma
- Separate forms for sexual and occupational exposure

Take PEP baseline bloods- HIV serology, creatinine, ALT and ALP (Group on symphony)

Prescribe PEP on symphony (search 'post' in drug name)
- 5 day packs available
- Remind patients it is a 28 day course

Counsel patient on how to take PEP and inform them of the PEP passport (in the box)

Sexual exposure patients must contact the Claude Nicol center for follow up ASAP

If there is a complicated risk assessment, known HIV positive source or you are unsure- contact HIV SPR on 8075/via switch OOH

Considerations
- Drug interaction
- Pregnant?
- Breastfeeding?
- Is emergency contraception required?
- Sexual assault?

SHAC East (Claude Nicol Centre), Eastern Road, Brighton, BN2 5BE Tel: 01273 523388

- **Complete PEP referal form https://nww.bsuh.nhs.uk/clincal/teams-and-departments/hiv/pep-referal**
- **Link can be found on microguide under 'post exposure prophylaxis'**
- **Occupational Health MUST be notified of all occupational exposures**

Post Exposure Prophylaxis (PEP)

Brighton and Sussex University Hospitals NHS Trust

	Source HIV status			
	HIV positive		Unknown HIV status	
	Viral load detectable (>200c/ml)	Viral load undetectable (<200c/ml)	From high prevalence group / area *	From low prevalence group / area
Receptive anal sex	Recommend	Not recommended	Recommend	Not recommended
Insertive anal sex	Recommend	Not recommended	Consider†	Not recommended
Receptive vaginal sex	Recommend	Not recommended	Consider†	Not recommended
Insertive vaginal sex	Consider	Not recommended	Consider†	Not recommended
Fellatio with ejaculation‡	Not recommended	Not recommended	Not recommended	Not recommended
Fellatio without ejaculation‡	Not recommended	Not recommended	Not recommended	Not recommended
Splash of semen into eye	Not recommended	Not recommended	Not recommended	Not recommended
Cunnilingus	Not recommended	Not recommended	Not recommended	Not recommended
Sharing of injecting equipment**	Recommended	Not recommended	Consider	Not recommended
Human bite§	Not recommended	Not recommended	Not recommended	Not recommended
Needlestick from a discarded needle in the community			Not recommended	Not recommended

High prevalence groups within this recommendation are those where there is a significant likelihood of the source individual being HIV-positive. Within the UK at present, this is likely to be men who have sex with men and individuals who have immigrated to the UK from areas of high HIV prevalence (particularly sub-Saharan Africa)

† More detailed knowledge of local prevalence of HIV within communities may change these recommendations from consider to recommended in areas of particularly high HIV prevalence

‡ PEP is not recommended for individuals receiving fellatio i.e. inserting their penis into another's oral cavity

§ A bite is assumed to constitute breakage of the skin with passage of blood. There have been a few case reports of HIV-transmission where the biter has a high viral load, blood in the oropharynx from trauma and inflicts a deep wounds through biting so in this scenario PEP could be considered.

Care of the Dying Patient

Brighton and Sussex University Hospitals NHS Trust

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

Brighton and Sussex University Hospitals NHS Trust

- All patients reconised 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/ breathlessness	1st line: Diamporphine	2.5-5mg SC	Pain 1 hourly / Dyspnoea 4 hourly
	2nd line: Morphine	5mg SC	1 hourly / 4 hourly
Known severe reanl faliure eGFR <30ml/min:	Alfentanil	0.25-0.5mg SC	1 hourly / 4 hourly
Nausea	Haloperidol	1.5mg SC	4 hourly
Distress from anxiety	Midazolam	2.5-5mg SC	1 hourly
Distress/agitation from delirium	Haloperidol	1-2.5mg SC	4 hourly
Respiratory secretions	Glycopyrronium	0.2mg 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 on line 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

Brighton and Sussex University Hospitals NHS Trust

Emergency

Promp+ Cards

Anaesthetics and Resuscitation Guidance

Sedation Checklist

Brighton and Sussex University Hospitals NHS Trust

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 the 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 thank the risks?

2. Prepare Equipment

Is all monitoring on?
- Capnography
- Is the 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

During CPR

- Ensure high quality chest compressions
- Minimise interruptions to compressions
- Give oxygen
- Use waveform capnography
- Continuous compressions when advanced airway in place
- Vascular access (intravenous or intraosseous)
- Give adrenaline every 3-5 min
- Give amiodarone after 3 shocks

Treat Reversible Causes

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

Consider

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

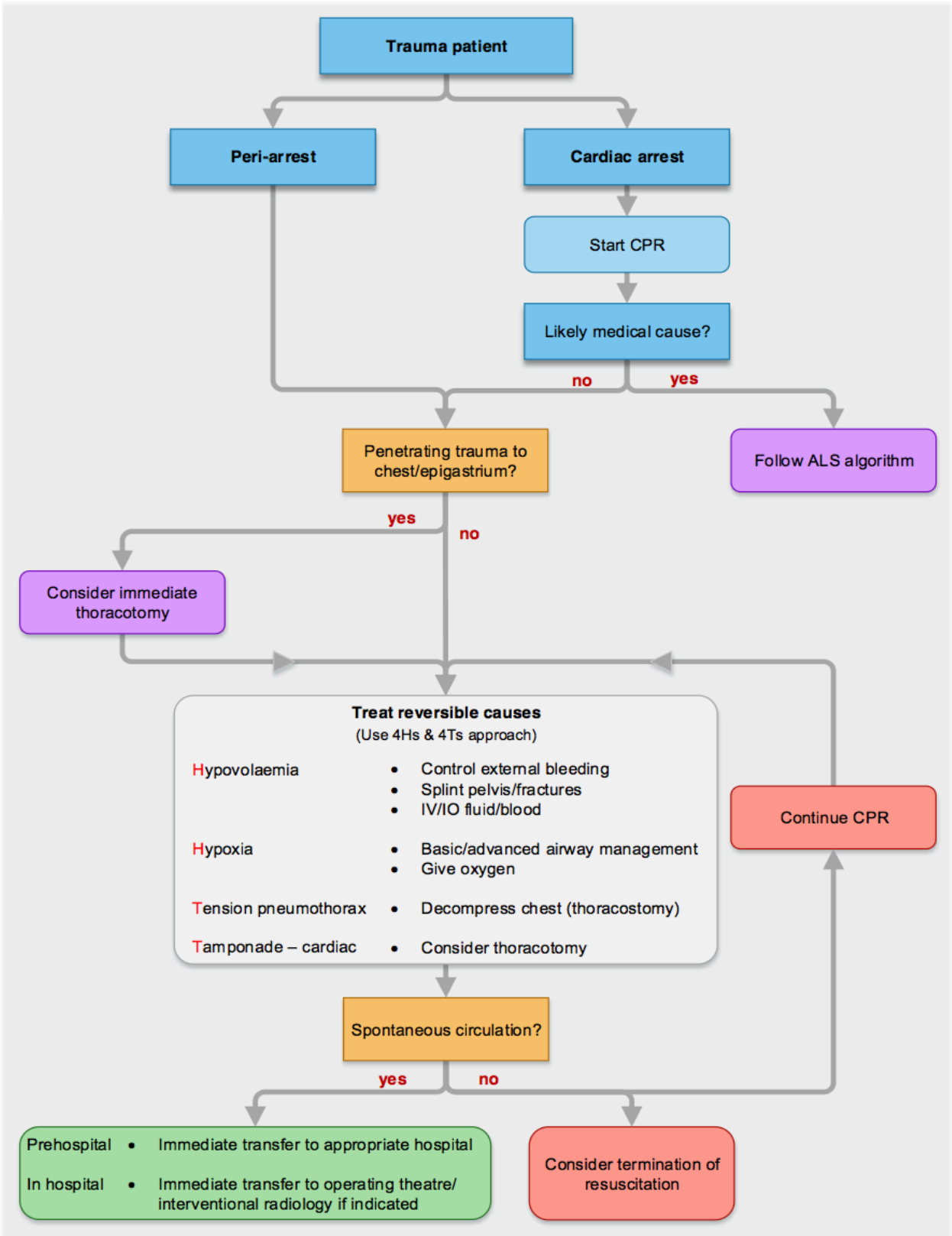
IMPLEMENTED APR 2019 VERSION 5.0 REVIEW DUE APR 2020

Brighton and Sussex University Hospitals NHS Trust

Resuscitation Council (UK)

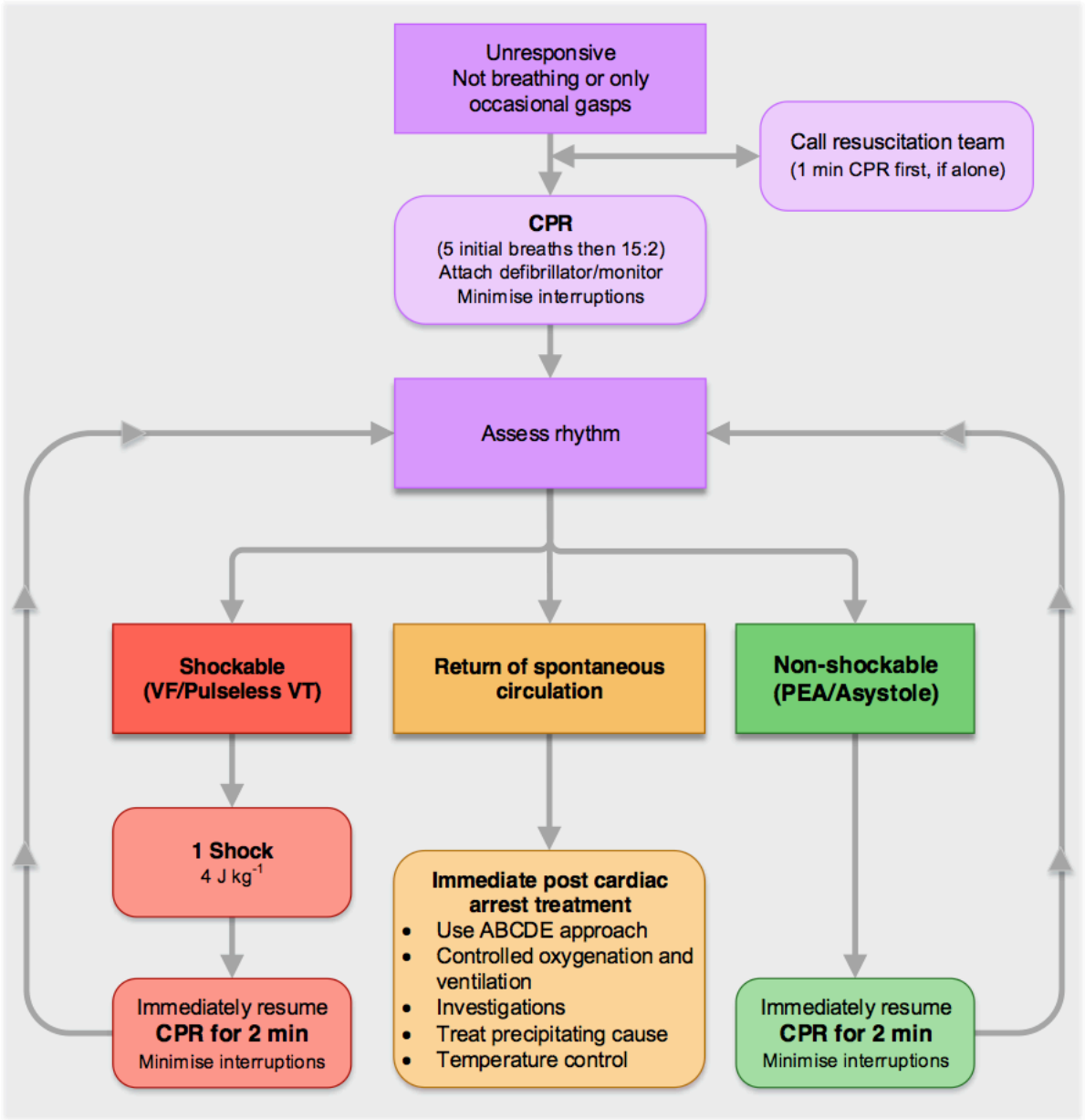
GUIDELINES 2015

Traumatic Cardiac Arrest Treatment Algorithm



Resuscitation Council (UK) GUIDELINES 2015

Paediatric Advanced Life Support



During CPR

- Ensure high-quality CPR: rate, depth, recoil
- Plan actions before interrupting CPR
- Give oxygen
- Vascular access (intravenous, intraosseous)
- Give adrenaline every 3-5 min
- Consider advanced airway and capnography
- Continuous chest compressions when advanced airway in place
- Correct reversible causes
- Consider amiodarone after 3 and 5 shocks

Reversible Causes

- Hypoxia
- Hypovolaemia
- Hyper/hypokalaemia, metabolic
- Hypothermia
- Thrombosis (coronary or pulmonary)
- Tension pneumothorax
- Tamponade (cardiac)
- Toxic/therapeutic disturbances

IMPLEMENTED APR 2019 VERSION 5.0 REVIEW DUE APR 2020

Paediatric Massive Haemorrhage Protocol

Brighton and Sussex University Hospitals NHS 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

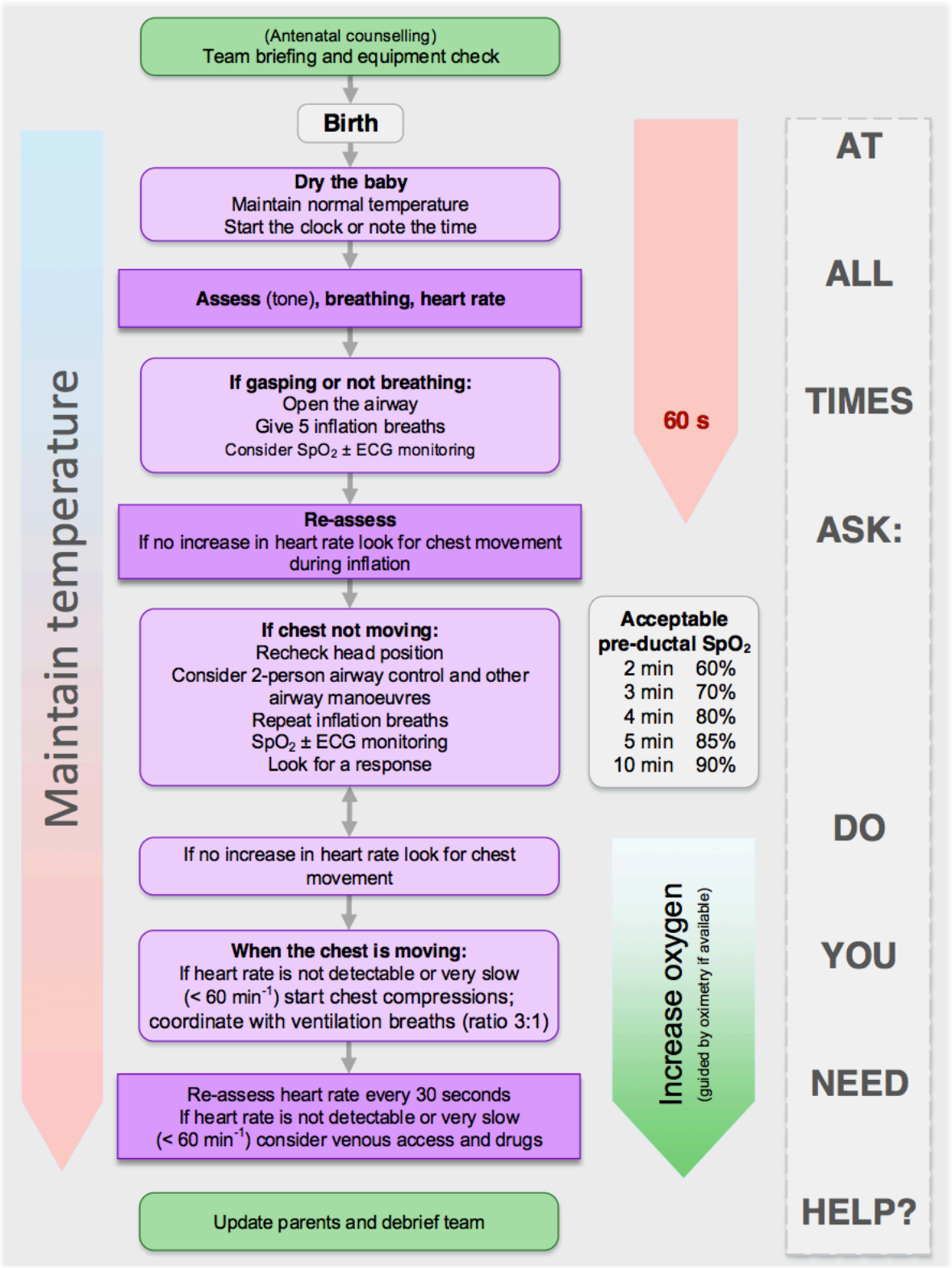
- Keep base excess < –6 mmol/L
- Keep ionised Ca > 1 mmol/L
- Keep K < 6.0 mmol/L

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

VERSION 5.0 REVIEW DUE APR 2020
IMPLEMENTED APR 2019
5


(Antenatal counselling)
Team briefing and equipment check
Birth
Dry the baby
Maintain normal temperature
Start the clock or note the time
Assess (tone), breathing, heart rate
If gasping or not breathing:
Open the airway
Give 5 inflation breaths
Consider SpO2 ± ECG monitoring
Re-assess
If no increase in heart rate look for chest movement during inflation
If chest not moving:
Recheck head position
Consider 2-person airway control and other airway manoeuvres
Repeat inflation breaths
SpO2 ± ECG monitoring
Look for a response
If no increase in heart rate look for chest movement
When the chest is moving:
If heart rate is not detectable or very slow (< 60 min-1) start chest compressions; coordinate with ventilation breaths (ratio 3:1)
Re-assess heart rate every 30 seconds
If heart rate is not detectable or very slow (< 60 min-1) consider venous access and drugs
Update parents and debrief team
Maintain temperature
60 s
Acceptable pre-ductal SpO2
2 min 60%
3 min 70%
4 min 80%
5 min 85%
10 min 90%
Increase oxygen
(guided by oximetry if available)
AT
ALL
TIMES
ASK:
DO
YOU
NEED
HELP?

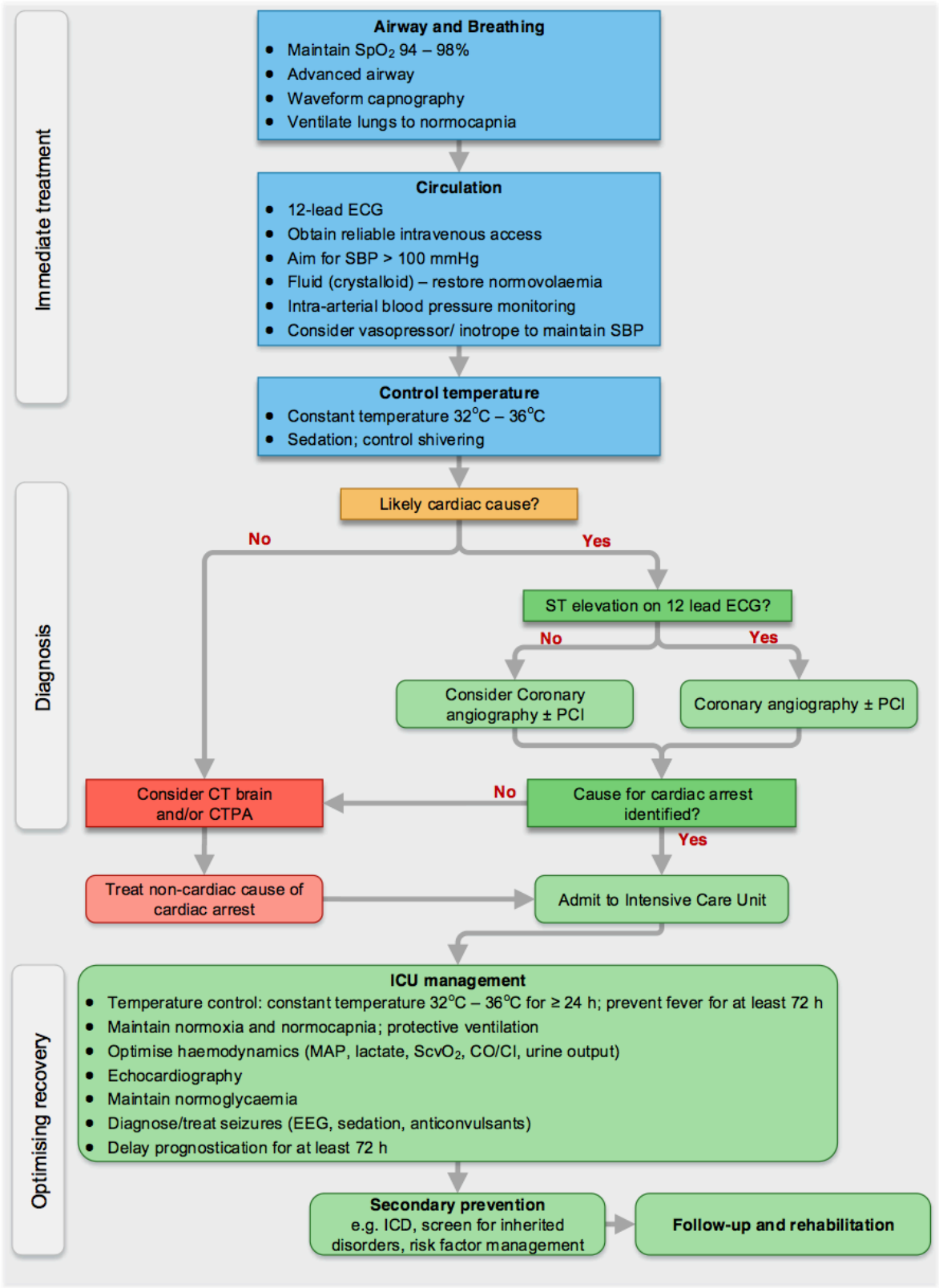
Hypothermic Cardiac Arrest

TBC

Resuscitation Council (UK) GUIDELINES 2015

Post-resuscitation Care

(ROSC and comatose)



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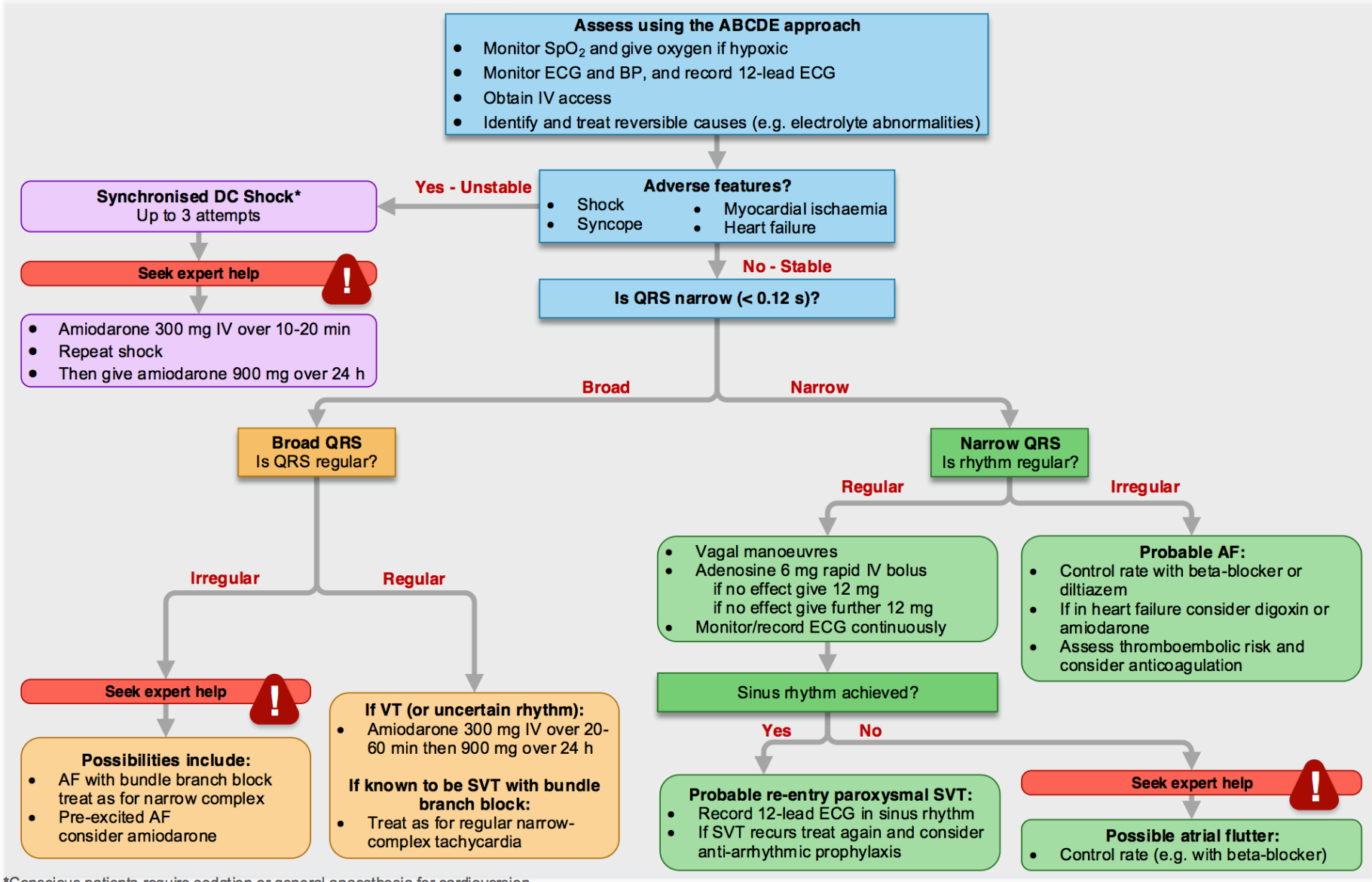
Resuscitation Council (UK) GUIDELINES 2015

Adult Tachycardia (with pulse) Algorithm



*Conscious patients require sedation or general anaesthesia for cardioversion

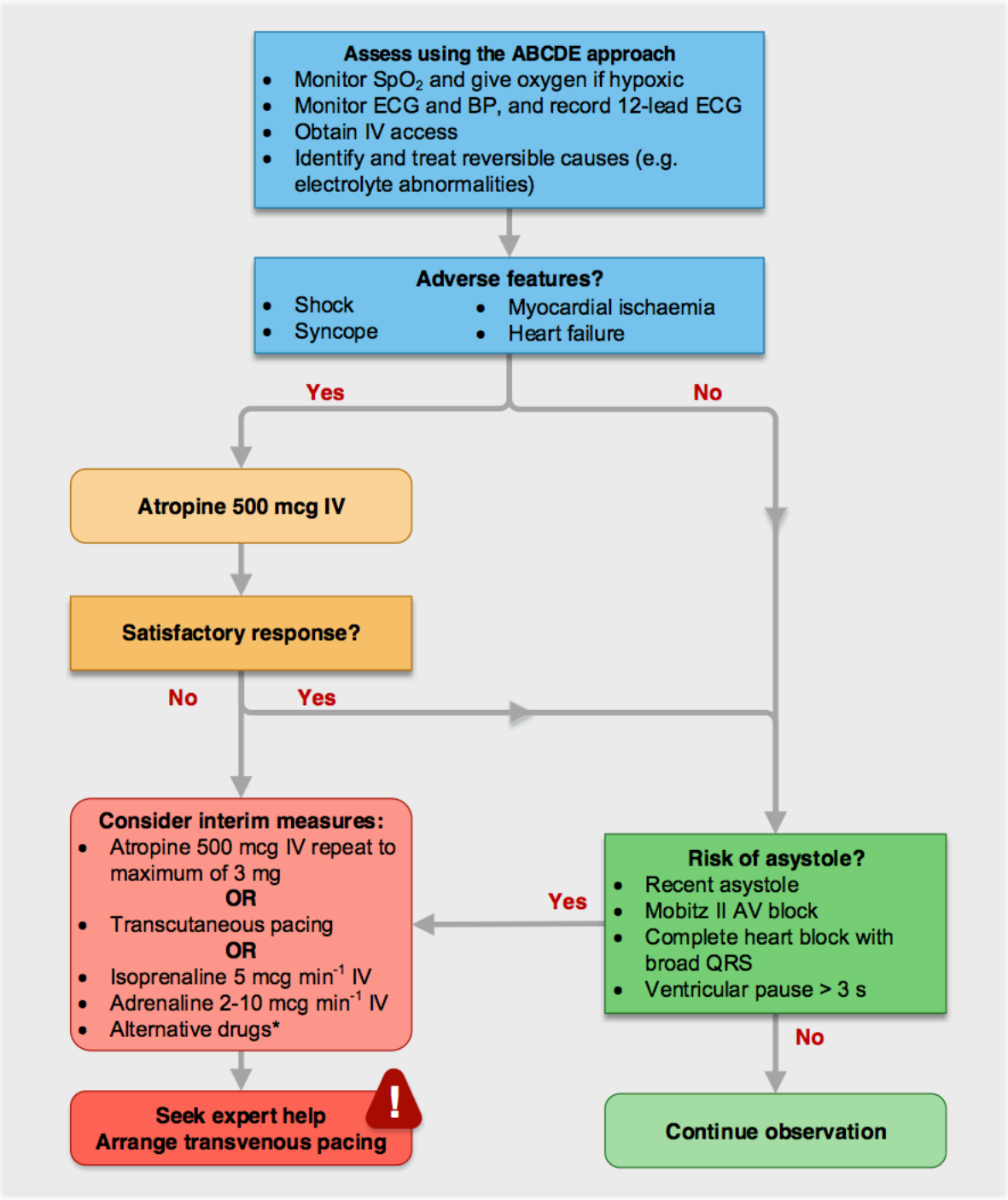
EMERGENCY DIRECT CURRENT CARDIOVERSION (DCCV)

Brighton and Sussex University Hospitals NHS Trust

1	Conscious patients require sedation or general anesthesia
2	Attach defibrillation pads and 3 lead monitoring
3	Press SYNC and observe sense markers ▼
4	If necessary, press LEAD and select lead with most sense markers ▼
5	Press ENERGY SELECT **Narrow complex:** 100j, 200j, 360j **Broad complex:** 150j, 200j, 360j
6	Remove oxygen, Tell all staff to stand clear. Press CHARGE
7	Press **and hold** ⚡ until the shock is delivered

Resuscitation Council (UK) GUIDELINES 2015

Adult Bradycardia Algorithm



*** Alternatives include:**

- Aminophylline
- Dopamine
- Glucagon (if bradycardia is caused by beta-blocker or calcium channel blocker)
- Glycopyrrolate (may be used instead of atropine)

10 VERSION 5.0 REVIEW DUE APR 2020 IMPLEMENTED APR 2019

EXTERNAL PACING

Brighton and Sussex University Hospitals NHS Trust

1	Attach defibrillation pads and 3 lead monitoring
2	Press PACER
3	Press ▲ RATE ▼
4	Press ▲CURRENT▼ to increase current until electrical capture
5	**Palpate central pulse** to confirm **mechanical capture**
6	If necessary, increase ▲CURRENT▼ until Mechanical capture
7	To view intrinsic rhythm press **and hold** PAUSE
8	Consider sedation or analgesia if patient uncomfortable

Anaphylaxis

Brighton and Sussex University Hospitals NHS Trust

ABCDE Assessment and confirmation of Anaphylaxis

- Administer Adrenaline IM 1:1,00

Adult	**0.5 mg (0.5 mL of 1:1,1000)**
Child more than 12 years	**0.5 mg (0.5 mL of 1:1,1000)**
Child 6 – 12 years	**0.3 mg (0.3 mL of 1:1,1000)**
Child less than 6 years	**0.15 mg (0.15 mL of 1:1,1000)**

Repeat after 5 minutes if no improvement

Anaphylaxis Algorithm

Resuscitation Council (UK)

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

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

Brighton and Sussex University Hospitals NHS Trust

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

Brighton and Sussex University Hospitals NHS Trust

Prepare the patient

- ❑ **Reliable IV / IO access**
- ❑ **Optimise position**
  - ❑ Sit-up?
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  - ❑ 3 mins or ETO_2 > 85%
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  - ❑ Nasal O_2
- ❑ **Optimise patient state**
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  - ❑ SpO_2 / waveform $ETCO_2$ / ECG / BP
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  - ❑ 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

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- ❑ Runner
- ❑ MILS (if indicated)
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    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

Brighton and Sussex University Hospitals NHS 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	CO2 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

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.

CODE RED

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1	Assign **COMMUNICATOR** role to liaise with: • 1st → Transfusion lab (red phone/bleep 8286) **Request Pack A** - **KNOW** patient sex, age & estimated weight • 2nd → Theatres (CEPOD co-ordinator ext 4172, bleep 8061) • 3rd → Contact surgical consultant on call • 4th → Contact radiology reg; ensure aware of need for primary survey CT report
2	Ensure porter is sent to lab to collect **Pack A**
3	Send ROTEM sample (blue citrate bottle black top) with G&S to transfusion lab with porter
4	As soon as **PACK A** arrives Give 6g of riastap & 4 units of Group O Red Cells
5	<3 hours since injury → Ensure 1g **TRANEXAMIC ACID IV** has been given STAT & start infusion1g Tranexamic Acid in 100mL 0.9% sodium chloride over 8 hours • **Reverse warfarin** – **Give Octaplex**. DOACs – seek haematology advice
6	Avoid **Hypothermia** (<35˚C) → warm fluids, cover patient, monitor core temp
7	Request **Pack B** if ongoing bleeding (4 units red cells and up to 6g of riastap)
8	Repeat ROTEM. Further products guided by ROTEM result
9	If ongoing bleeding after 6 units of RBC request **Pack C** (1 pool of Platelets)
10	If patient still bleeding or ROTEM not available request **Pack D** (4 RBC, 1 PLT, 4 FFP, 4 cryo)
11	Get **RAPID SURGICAL CONTROL**

Pack A&B
- Red cells 4 units
- 6g riastap

Pack C
- Platelets 1 pool

Pack D
- Red cells 4 units
- Platelets 1 pool
- FFP 4 units
- Cryoprecipitate 4 units

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Riastap- Users Guide

Brighton and Sussex University Hospitals NHS Trust

Equipment

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

Preparation

1. Use aseptic technique
2. Draw up 50ml 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

ROTEM

Brighton and Sussex University Hospitals NHS Trust

1	Request Pack A (4 units of RBC and 6g of RIASTAP)
2	**Send ROTEM sample** (blue citrate bottle black top) with G&S • Rushed to the transfusion lab by porter Request on symphony with G&S
3	If the patient is bleeding and cannot wait for ROTEM result Pack B can be requested • Pack B 4 RBC, 6g riastap
4	Obtain results via ROTEM shortcut on resus computer desk top • Password: *rotemremote*
5	This is a live system – within 5-10 minutes results will be shown on the system
6	Full analysis will be available within 20 minutes of receipt in the lab
7	Lab will call with ROTEM result and discuss appropriate product issue
8	However, all products available at clinicians request
9	Repeat ROTEM sample once treatment given for further guidance

ROTEM Results

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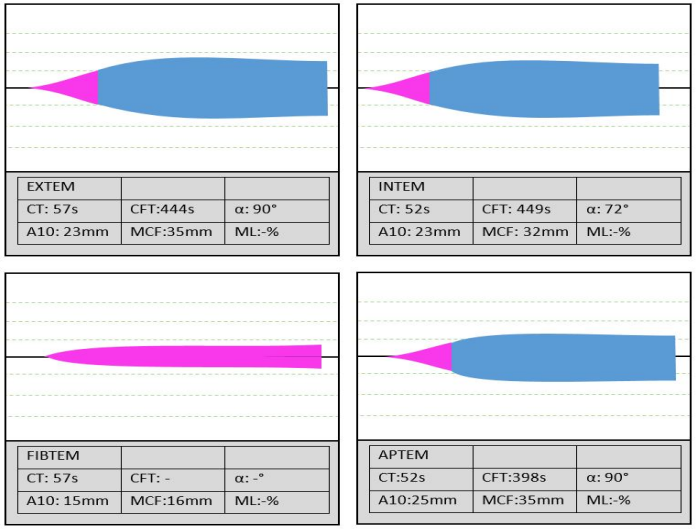
Normal: No action



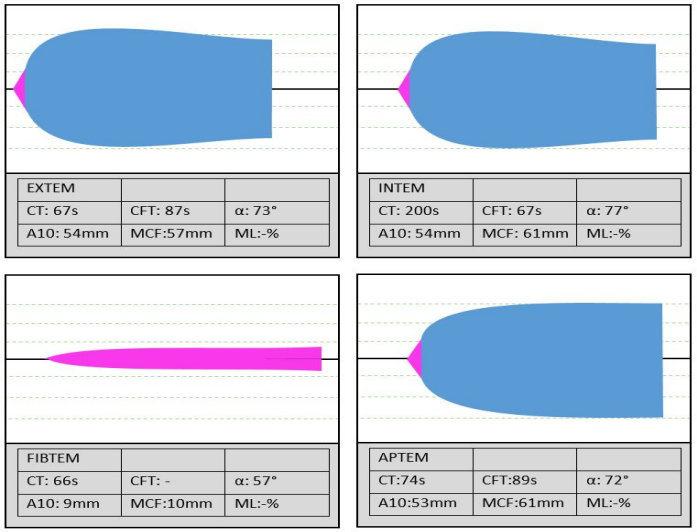
EXTEM		
CT: 57s	CFT:444s	α: 90°
A10: 23mm	MCF:35mm	ML:-%

INTEM		
CT: 52s	CFT: 449s	α: 72°
A10: 23mm	MCF: 32mm	ML:-%

FIBTEM		
CT: 57s	CFT: -	α: -°
A10: 15mm	MCF:16mm	ML:-%

APTEM		
CT:52s	CFT:398s	α: 90°
A10:25mm	MCF:35mm	ML:-%

Thrombocytopenia: Give platelets



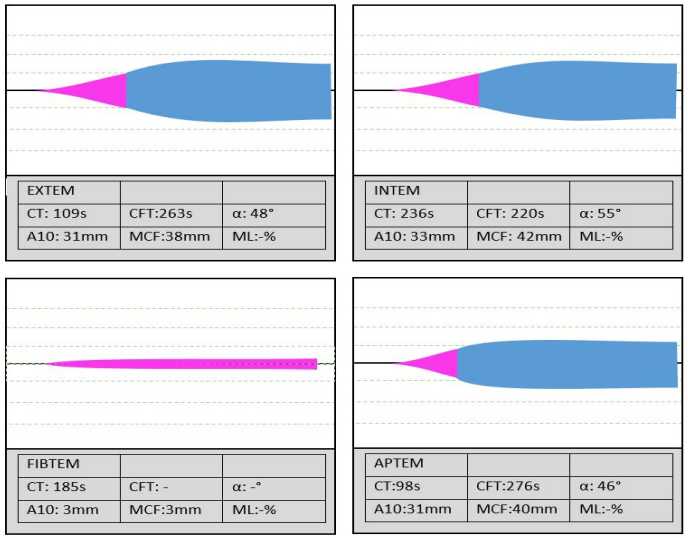
EXTEM		
CT: 67s	CFT: 87s	α: 73°
A10: 54mm	MCF:57mm	ML:-%

INTEM		
CT: 200s	CFT: 67s	α: 77°
A10: 54mm	MCF: 61mm	ML:-%

FIBTEM		
CT: 66s	CFT: -	α: 57°
A10: 9mm	MCF:10mm	ML:-%

APTEM		
CT:74s	CFT:89s	α: 72°
A10:53mm	MCF:61mm	ML:-%

Low Fibrinogen: Give cryoprecipitate/riastap



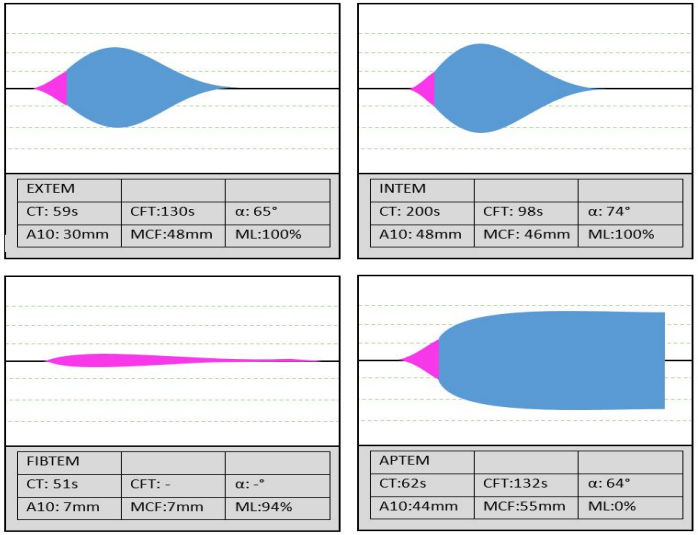
EXTEM		
CT: 109s	CFT:263s	α: 48°
A10: 31mm	MCF:38mm	ML:-%

INTEM		
CT: 236s	CFT: 220s	α: 55°
A10: 33mm	MCF: 42mm	ML:-%

FIBTEM		
CT: 185s	CFT: -	α: -°
A10: 3mm	MCF:3mm	ML:-%

APTEM		
CT:98s	CFT:276s	α: 46°
A10:31mm	MCF:40mm	ML:-%

Hyperfibrinolysis : Give TXA



EXTEM		
CT: 59s	CFT:130s	α: 65°
A10: 30mm	MCF:48mm	ML:100%

INTEM		
CT: 200s	CFT: 98s	α: 74°
A10: 48mm	MCF: 46mm	ML:100%

FIBTEM		
CT: 51s	CFT: -	α: -°
A10: 7mm	MCF:7mm	ML:94%

APTEM		
CT:62s	CFT:132s	α: 64°
A10:44mm	MCF:55mm	ML:0%

ROTEM Result Interpretation

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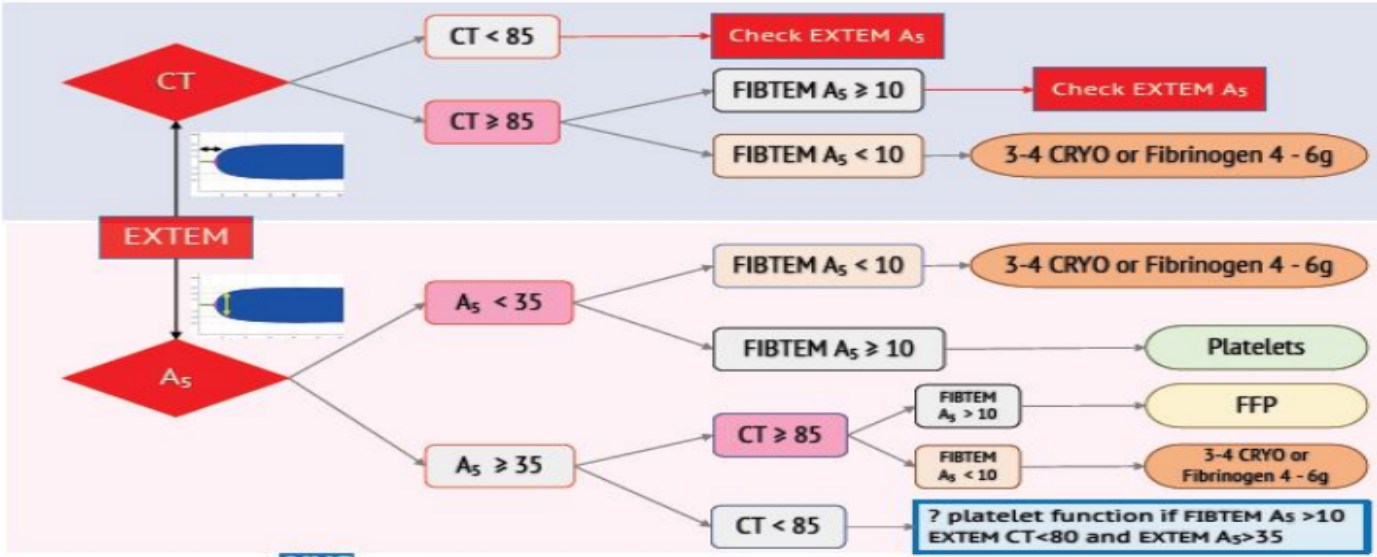
ROTEM A5 - amplitude at 5 min Fibtem and Extem	Fibtem < 10mm	Give 3-4 CRYO or 4-6g Fibrinogen concentrate
	Fibtem ≥ 10mm	Check Extem
	Extem < 35mm	If Fibtem <10 - give 3-4 CRYO or 4-6g Fibrinogen concentrate If Fibtem ≥10 - give 1 PLATELETS
	Extem ≥ 35mm	No further blood products if Fibtem ≥10 and Extem CT < 85s
ROTEM CT - clotting time s Extem	Extem CT < 85s	No further blood products if Fibtem ≥10 and Extem A5 ≥ 35
	Extem CT ≥ 85s	If Fibtem ≥10 - give 4 FFP if Extem A5 ≥35 or 1 PLATELETS if Extem A5 < 35 If Fibtem <10 - give 3-4 CRYO or 4-6g Fibrinogen concentrate

1. Check FIBTEM A_5 first — **If active or suspected bleeding:** correct low FIBTEM (low fibrinogen) **first** — v. A_5

2. Look at EXTEM CT and A_5 — Repeat FIBTEM and EXTEM after blood product transfusion or every 30 mins if actively bleeding



STOP the cause of bleeding!
- Physical
- Surgical

Tranexamic acid

Targets
- Hb 90-100 g/L if bleeding
- Platelets > 50 x10^9/L
- Systolic BP 80-100 mmHg
- Mean BP ≥ 80 if brain injury
- Temperature 35 - 37° C
- pH > 7.2

Doses

Cryoprecipitate (5u/bag)
- 4 bags ~ 6g Fibrinogen
- 3 bags ~ 4.5g
- 2 bags ~ 3g

Fibrinogen 25-50 mg/kg

FFP 20 ml/kg

Platelets – 1 pool

Tranexamic acid 2g (10-30 mg/kg)

Dual anti-platelet drugs or DOAC – ask specialist help

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ROTEM® - guided intervention in critical bleeding

Brighton and Sussex University Hospitals NHS Trust

Emergency

Promp+ Cards

Procedures

Central Venous Catheter (CVC) Insertion

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1	Ensure patient is stable enough to use this prompt card
2	Team brief and a plan for any difficulties. At this point ensure **consent** is obtained • Get **USS machine** and **CVC Equipment Box**
3	Ensure monitoring & Oxygen are on the patient and working
4	**Hat** and **mask** worn by operator. **HANDS WASHED**. Sterile gloves and gown worn
5	2% **Chlorhexidine** is applied to skin area and allowed to dry. Drape to make **sterile working field**
6	Sterile sheath and sterile gel used with ultrasound probe
7	Unless contraindicated place central line in the **Right Internal Jugular** if for inotrope administration put primed (with infusion) double swan lock on a dedicated line
8	After insertion and line is sutured in securely ensure **sterile dressing** is applied (Tegaderm/Opsite)
9	Organise **portable chest x-ray** in resus (Bleep: RSCH 8364, PRH 6157) & review for pneumothorax and line position

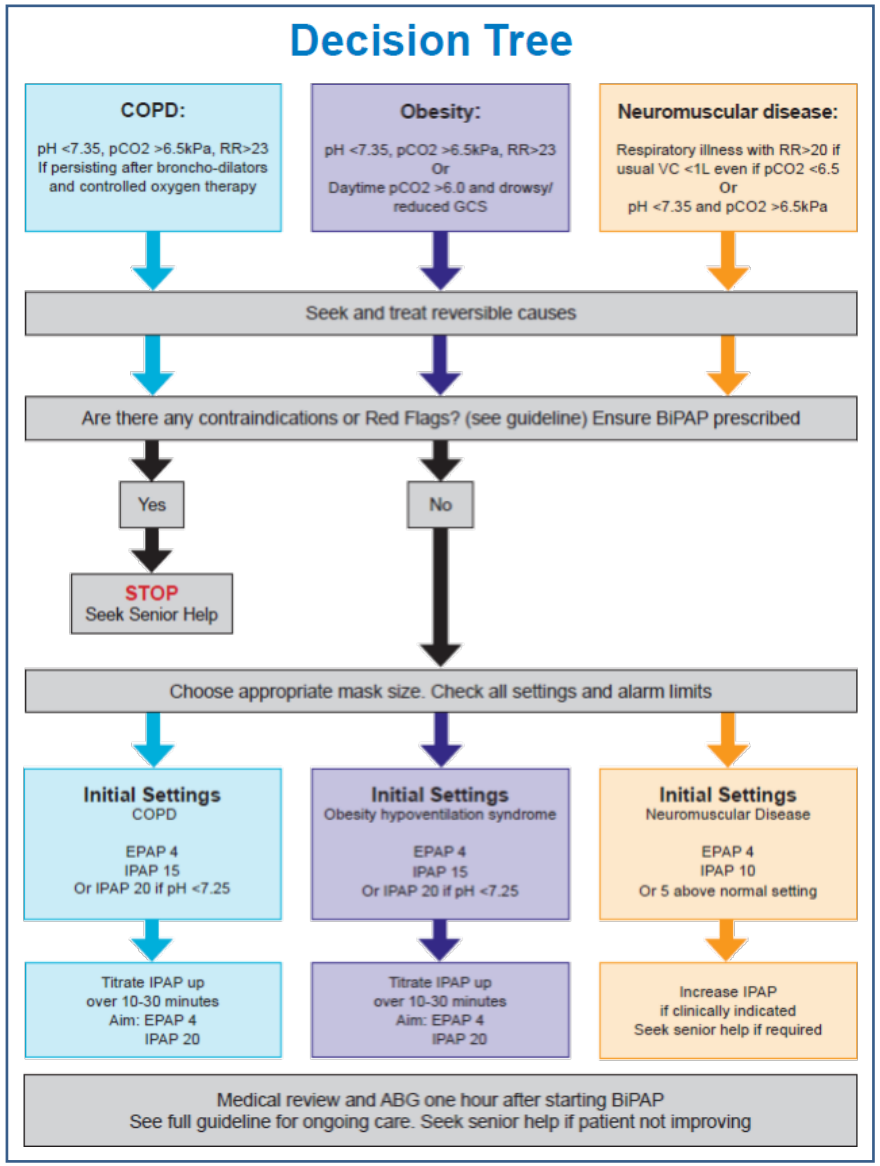
Femoral CVC is a last resort

Contraindication: diarrhoea

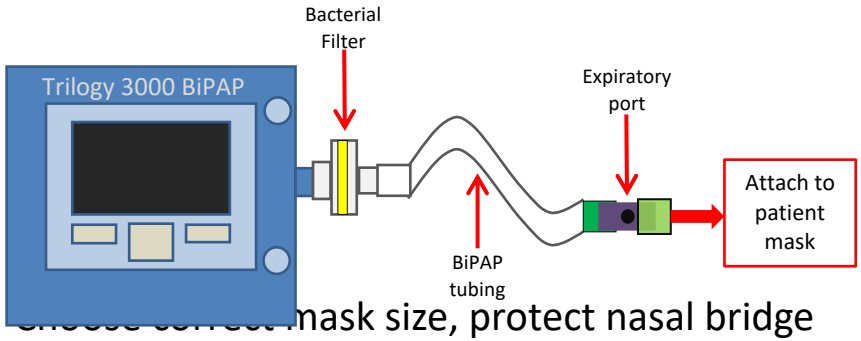
- 16cm line for RIJ
- 22cm line for femoral

Setting up BiPAP (NIV) for acute hypercapnic respiratory failure

Brighton and Sussex University Hospitals NHS Trust



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. [illegible] mask size, protect nasal bridge with dressing.
6. Check all settings and alarms.
7. See BSUH microguide for full BiPAP set up guidelines.

NIV exclusion criteria

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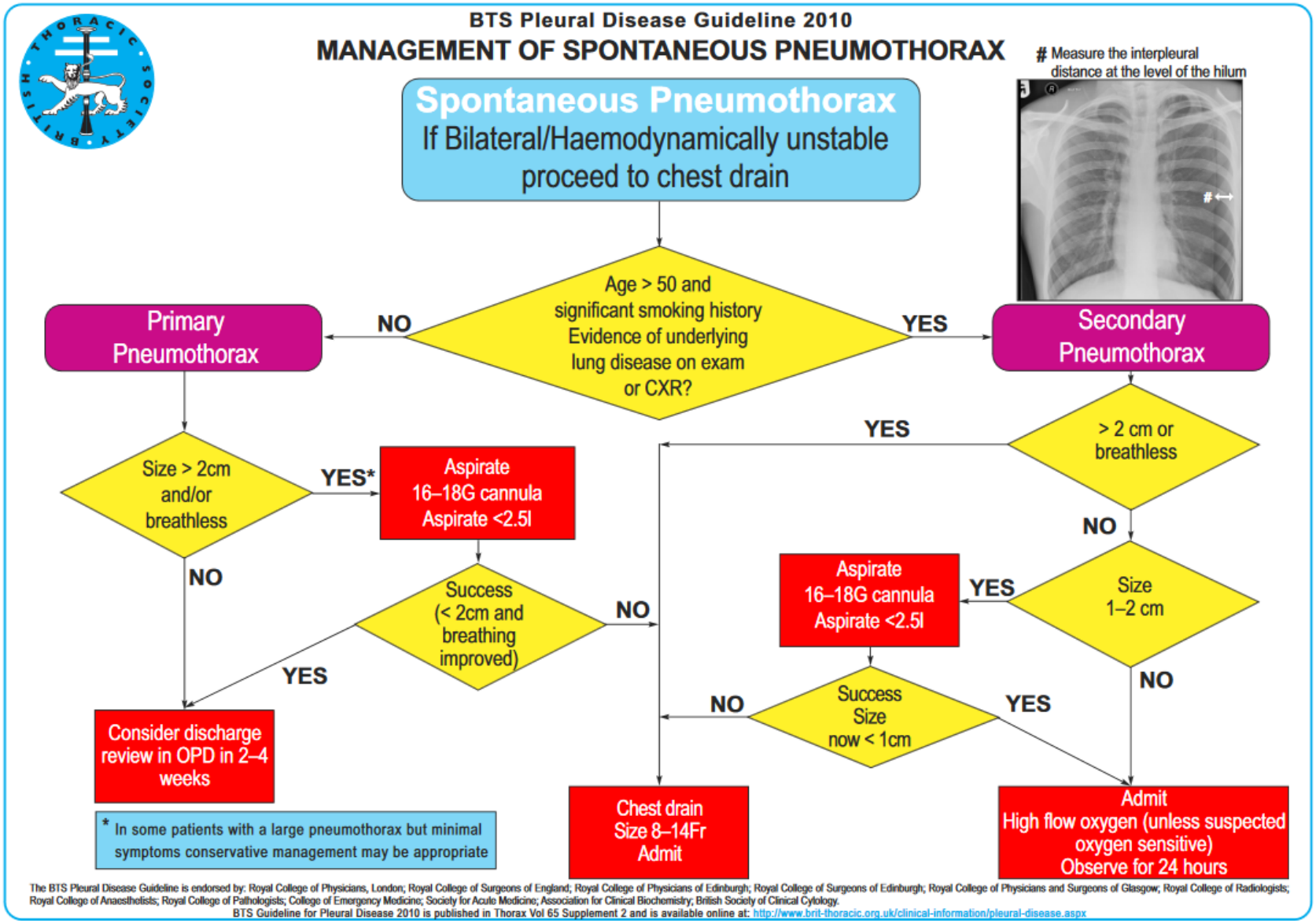
- Patient declines treatment
- Facial burns / trauma / recent facial or upper airway surgery
- Fixed upper airway obstruction
- Undrained pneumothorax
- Haemodynamically unstable requiring inotropes/pressors (unless in a critical care unit)
- Severe co-morbidity
- Inability to protect airway (relative contraindication)
- Copious respiratory secretions (relative contraindication)
- Upper gastrointestinal surgery (relative contraindication)
- Vomiting (relative contraindication as NG tube can be considered in these patients if intubation is not an option)
- Confusion / agitation (relative contraindication)
- Bowel obstruction (relative contraindication)

If relative contra-indications present the patient likely needs increased supervision– consider HDU/ITU

Management of Spontaneous Pneumothorax



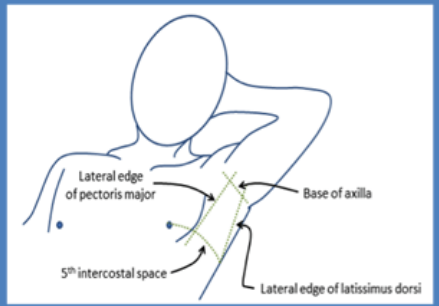
Chest Drain Insertion

Brighton and Sussex University Hospitals NHS Trust

BEFORE THE PROCEDURE

- Patient identity checked as correct?
- Is the ED the appropriate location?
- Have you gained consent?
- Do you have the appropriate equipment (incl USS if required)?
- Confirm site of clinical abnormality
- Confirm site of radiological abnormality
- Medicines and coagulation checked?
- Any known drug allergies?
- Safe site of drain insertion identified?
- Are there any concerns about this procedure for the patient?

'SAFE TRIANGLE'



TIME OUT

- Is the patient on high flow oxygen +/- adequate ventilator settings?
- Has the patient had adequate analgesia?
- Have you considered procedural sedation?
- Is position optimal?
- Roles allocated?
  - Doctor performing analgesia +/- sedation
  - Doctor inserting chest drain
  - Nurse
- Are there any concerns about the procedure?
- Do you need extra help?

PROCEDURE

- Sterile scrub, gown and gloves?
- Chloraprep 2% to skin?
- Local anaesthetic?
- Large fenestrated drape

SIGN OUT

- Sutures, tubing and dressing secured?
- Patient advised about care and not elevating drain above chest?
- Analgesia prescribed
- CXR requested to confirm position
- Verbal handover to Resus nurse and admitting team
- Fully documented in notes +/- sedation database
- ***NB: If on going significant blood draining from ICD (>200-250ml/hr) or haemodynamic compromise, consider need for surgical or radiological intervention***

Ref: Adapted from Faculty of Intensive Care Medicine

Fascia Iliaca block- Landmark technique

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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 • 1cm 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 proceedure • 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
- 2.5mg/ml
- Safe maximum dose = 2mg/kg

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

Organ Donation

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1	Does your intubated/ventilated patient fit one of these **CLINICAL TRIGGERS**? • Catastrophic brain injury with absence of >1 cranial nerve reflex and GCS <4 (not sedated) • Planned withdrawal of life sustaining treatment in patient with life threatening or life limiting condition
2	Refer to ITU for consideration of ongoing management - brain stem death testing / donation after circulatory death (DCD) (ITU SpR bleep **8413)**
3	**DO NOT DISCUSS** potential of Organ Donation in ED with family
4	Contact the **Specialist Nurse for Organ Donation** on **UK Organ Donor Referral Line 03000 20 30 40** (24 hours a day)
5	Refer **all** patients <86 years of age regardless
6	Consider Tissue Donation in ALL patients that die in ED – call 08004320559
7	For more information see **odt.nhs.uk**

Peri-Morten Caesarean Section

TBC

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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 5mg/kg (usually 250-300mg) • **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 100ml 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 1mg 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 hypokalemia	

Aminophylline Dosing and Infusion Rate

Brighton and Sussex University Hospitals NHS Trust

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

50KG (Male)/45 KG (Female) + 2.3KG 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

Labetalol Infusion

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For use in Malignant Hypertension

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

Preparation:

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

Infusion:

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

Naloxone Usage & Infusion

Brighton and Sussex University Hospitals NHS Trust

1	Suspected opioid over dose with a RR <10 • Give 100 micrograms bolus of Naloxone IV • Repeat doses ever 2 minutes until RR >10
2	Administer Naloxone STAT undiluted Naloxone can be given IM but effect is delayed
3	Preform an ABG to ensure patient does not have respiratory acidosis due to CO2 retention
4	Naloxone infusion for partial response and to maintain RR >10 • Starting dose = 60% of the dose required to obtain a RR>10
5	• Effective bolus dose X 6 • Add the above dose of naloxone to 1L of 0.9% Saline • Infused at a rate of 100mL/hour
6	Example: • If 400 micrograms required to maintain RR>10 • 400 microgram X 6 = 2400 microgram add this to 1L 0.9% saline • Infusion of 100microgram per hour provides a dose of 240 microgram/hour
7	Slowly decrease the infusion over 2-3 hours. Stop when RR remains stable Dispense Naloxone mini-jets to known IVDU's from majors 2S drug cupboard

Salbutamol Infusion

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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 2mL
3	Dilute with 10ml of water for injection • To give a concentration of 50 microgram/mL • Administer 250 micrograms (5mL) IV over 3-5 minutes
4	Repeat 250 microgram bolus if required OR start infusion
5	**Preparing infusion:** • Add Salbutamol 5mg in 5mL to 500mL of 5% glucose • Giving a concentration of 10 microgram/mL • Start infusion at 5microgram/minute (0.5mL/minute) • Adjust rate of infusion according to response and heart rate • Normal dose 3-20 microgram/minute (a rate of 0.3-2mL/minute)
6	• Monitor for **tachycardia** • **Check potassium** levels every 1-2 hours whilst infusion running

Octaplex for Warfarin Reversal in Life Threatening Bleeding

Brighton and Sussex University Hospitals NHS 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 to 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 Heam SPR 8472 9-5. OOH Consultant Haematologist via switch
2	Send coagulation sample to the lab
3	Weigh/Estimate patients 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 3250 to collect from lab when ready
7	Administer Octaplex. Each vial reconstituted with 20mls of water for injection
8	Give IV starting 1mL/min, increasing to max 2-3mL/min. Monitor for tachycardia
9	Give 5mg-10mg 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 reg in hours or consultant OOH
- Octaplex dose 50 iu/kg for reversal of anti Xa drugs
- Idarucizumab used for the reversal of Dabigatran

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

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1	ED Consultant or ITU SpR/consultant requests inotropes for use in resus
2	Do you have a **patent dedicated CETRAL 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** 4mg + 46mLs of 5% dextrose = total volume of 50mLs • **Adrenaline (1 in 1000)** 4mg + 46mLs of 5% dextrose = total volume of 50mLs
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

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Emergency

Promp+ Cards

Clinical Scores

Admission Blatchford Score

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Admission Risk Marker	Parameter	Score
Blood Urea mmol/L	≥ 6.5 – 7.9	2
	8.0 – 9.9	3
	10.0 – 24.9	4
	≥ 25.0	6
Haemoglobin (men) g/dL	≥ 12-13	1
	10.0 – 11.9	3
	<10	6
Haemoglobin (women) g/dL	≥10 - 12	1
	<10	6

Admission Risk Marker	Parameter	Score
Systolic BP mmHg	100 - 109	1
	90 - 99	2
	< 90	3
Other Markers	HR > 100	1
	Melena	1
	Syncope	2
	Hepatic Disease	2
	Cardiac Failure	2

CHA_2DS_2-VASc Score (≥2 = Consider anticoagulation)

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Condition	Score
Congestive Cardiac Failure	1
Hypertension: ≥140/90 or known hypertension on medication	1
Age ≥ 75 years	2
Diabetes Mellitus	1
Stroke/TIA/VTE	2
Vascular Disease	1
Age 65-74 years	1
Sex Category: Female Sex	1

CURB 65 Score (Consider admission if ≥2)

Symptom	Score
Confusion (AMTS <8)	1
Urea > 7mmol/L	1
Respiratory Rate > 30	1
Blood Pressure (SBP < 90mmHg or DBP < 60mmHg)	1
Age ≥ 65 years	1

HAS-BLED Score

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Condition	Score
Hypertension ≥160mmHg systolic	1
Abnormal - Renal function (Dialysis/Transplant/Cr ≥ 200 µmol/L) - Liver Function (Cirrhosis/Bilirubin > x2 normal/AST or ALT > x3 normal	1 1
Stroke: prior history	1
Bleeding: prior major bleed or predisposition to bleeding	1
Labile INR: in therapeutic range <60%	1
Elderly > 65 years	1
Drugs - Medication predisposing to bleeding (NSAID's, Anti-platelets) - Alcohol/Drugs	1

Risk	Total Score
Low (1.1%)	0-1
Intermediate (1.9%)	2
High (4.9%)	≥3

Modified Glasgow Score for Severity of Pancreatitis

Criteria	Score
PaO_2 <8 kpa	1
Age >55 years	1
Neutrophils >15 x 10^9 /L	1
Calcium <2 mmol/L	1
Raised Urea >16 mmol/L	1
Enzyme – LDH >600u/L	1
Albumin <32g/L	1
Sugar – Glucose >10 mmol/L	1

≥3 signifies severe disease and warrants a critical care referral

Wells DVT Score (≥ 2 = DVT Likely)

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Clinical Feature	Score
Active Cancer (treatment on going, within 6 months or palliative)	1
Paralysis, paresis or recent plaster immobilisation of the lower extremities	1
Recently bedridden for ≥ 3 days or major surgery within 12 weeks requiring general or regional anaesthesia	1
Localised tenderness along the distribution of the deep venous system	1
Entire leg swollen	1
Calf swelling ≥ 3cm larger than asymptomatic side	1
Pitting oedema confined to the symptomatic leg	1
Collateral superficial veins (non varicose)	1
Previously documented DVT	1
An alternative diagnosis is at least as likely as DVT	-2

Wells PE Score (≥ 4 = PE Likely)

Brighton and Sussex University Hospitals NHS Trust

Clinical Feature	Score
Clinical DVT (leg swelling and pain on palpation of deep veins)	3
An alternative diagnosis is less likely than a PE	3
HR >100bpm	1.5
Immobilisation for ≥ 3 days or surgery in the previous 4 weeks	1.5
Previous DVT/PE	1.5
Haemoptysis	1
Active Cancer (treatment on going, within 6 months or palliative)	1