Sheffield Children's NHS
NHS Foundation Trust

Resuscitation Handbook

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Peer reviewer	Alison Smith
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Purpose

This handbook provides staff with an easy reference guide to current resuscitation and other decision support emergency algorithms for use by staff in medical emergencies. It also provides drug doses and administration advice for drugs used in medical emergencies.

Intended Audience

For use by healthcare professionals at Sheffield Children's Hospital NHS Foundation Trust

Resuscitation Handbook

Table of Contents

1. Introduction

This handbook provides staff with an easy reference guide to current resuscitation and other decision support emergency algorithms for use by staff in medical emergencies. It also provides drug doses and administration advice for drugs used in medical emergencies.

2. Intended Audience

For use by healthcare professionals at Sheffield Children's Hospital NHS Foundation Trust

3. Guideline Content

This handbook provides staff with an easy reference guide to current resuscitation and other decision support emergency algorithms for use by staff in medical emergencies. It also provides drug doses and administration advice for drugs used in medical emergencies.

It includes:

- Paediatric Basic Life Support
- Choking
- Tracheostomy life support
- 'Can't ventilate' guidelines
- Asystole
- Pulseless Electrical Activity
- Ventricular Fibrillation
- Defibrillation
- Bradycardia
- Supraventricular Tachycardia
- Status Epilepticus
- Anaphylaxis
- Ventricular Tachycardia
- Massive blood loss
- Calculations
- Neonatal Resuscitation Drugs
- Paediatric Resuscitation Drugs
- Adolescent Resuscitation Drugs
- Adult Basic Life Support
- Adult Advanced Life Support
- Adult Resuscitation Drugs

This guideline should be used in conjunction with the Trust Initial Drug Doses for Medical Emergencies which provides drug doses and administration advice for drugs used in medical emergencies which are kept in the Trust Paediatric Emergency Drug Boxes.

4. References

BMJ Publishing Group. Advanced Life Support Group – Advanced Paediatric Life Support, The Practical Approach. 6th Edition 2016.

Advanced Life Support (Resuscitation Council UK) – 2016.

Resuscitation Council UK 2015 Resuscitation guidelines.

Resuscitation Council (UK) Emergency Treatment of Anaphylactic reactions – guidelines for healthcare providers 2008

NICE : Treatment for children, young people and adults with convulsive status epilepticus in hospital 1.14.2 (2012)

BNF for Children and BNF. Accessed on-line at https://www.bnf.org/products/bnf-online/ last accessed December 2016

Resuscitation Council (UK) Paediatric Emergency Treatment Chart, May 2011. Accessed on-line at https://www.resus.org.uk/, January 2016

NHS England, Patient safety Alert. Risk of distress and death from inappropriate doses of naloxone in patients on long-term opiod/opiate treatment. November 2014.

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RESUSCITATION HANDBOOK

HOSPITAL SITE

This handbook is intended for use as a guide by all clinical staff involved in resuscitation on SC(NHS)FT **MAIN HOSPITAL SITE & NGH OPD2** premises and by the **EMBRACE TEAM**.

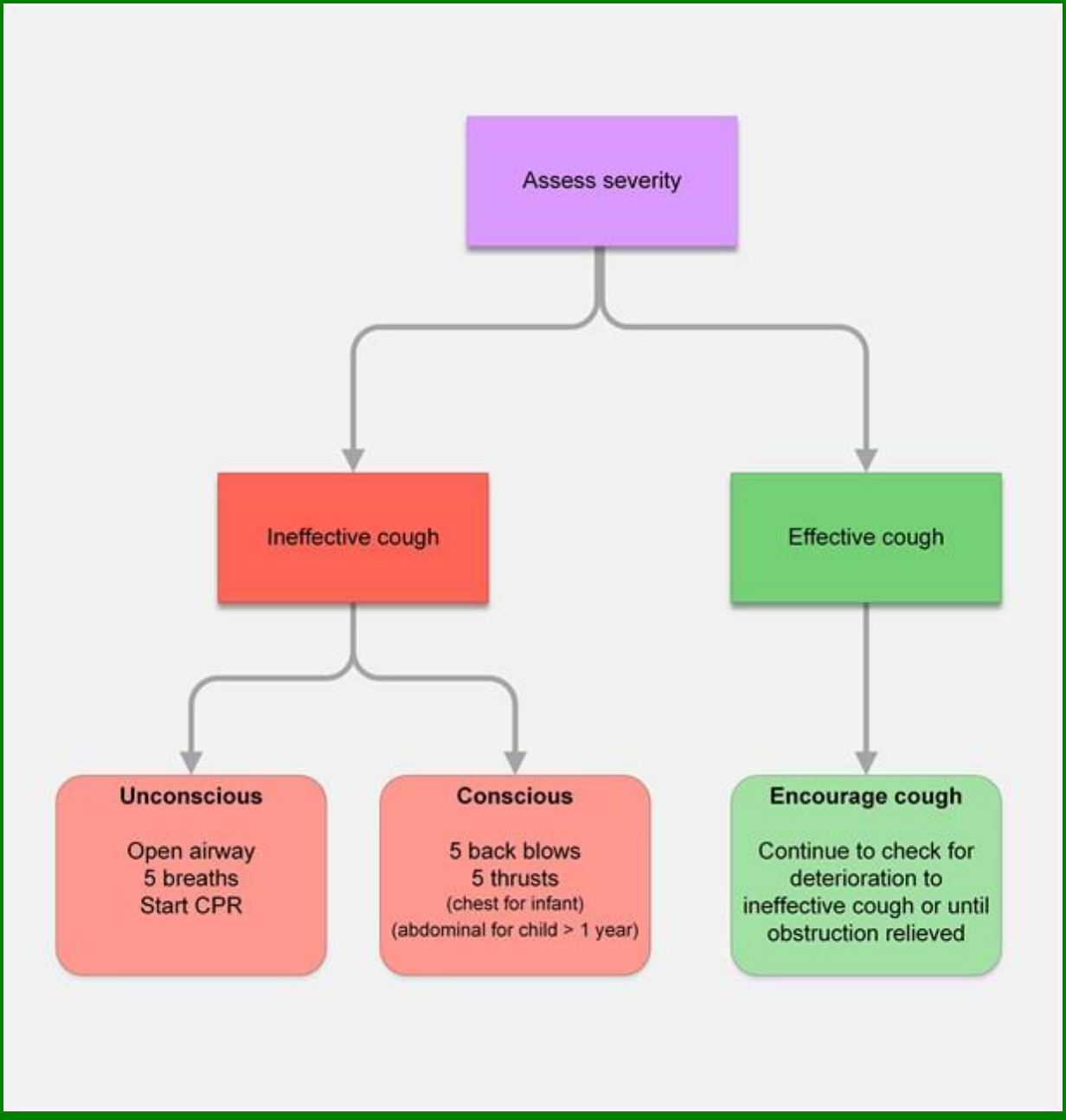
The handbook is based on current national APLS/ALS/RCUK (2015) guidance and the BNF for Children and BNF (2015/6).

Index

Paediatric Basic Life Support

Basic Life Support

Choking Algorithm



Tracheostomy life support

Apnoeic patient (**not breathing**)

Shout for help (**2222** in hospital or **999)**

Suction and/or tube change.
All patients carry with them a spare tube of the same size and one smaller.
If suction given then once only to check tube patency.

Working clear tracheostomy

5 Rescue Breaths

- Attatch ambu bag of appropriate size to tracheostomy tube
- (or via mouth to tracheostomy)
- Administer high flow oxygen if available via the ambu bag

Fail to insert or clear tracheostomy tube *

5 Rescue Breaths

- Perform mouth to mouth, mouth to mouth and nose or Bag valve mask resuscitation.
- Block off the stoma site if air is escaping through it but otherwise leave the stoma site alone (i.e. do not insert anything into it).

Commence CPR if child does not show signs of life after the 'rescue breaths'.

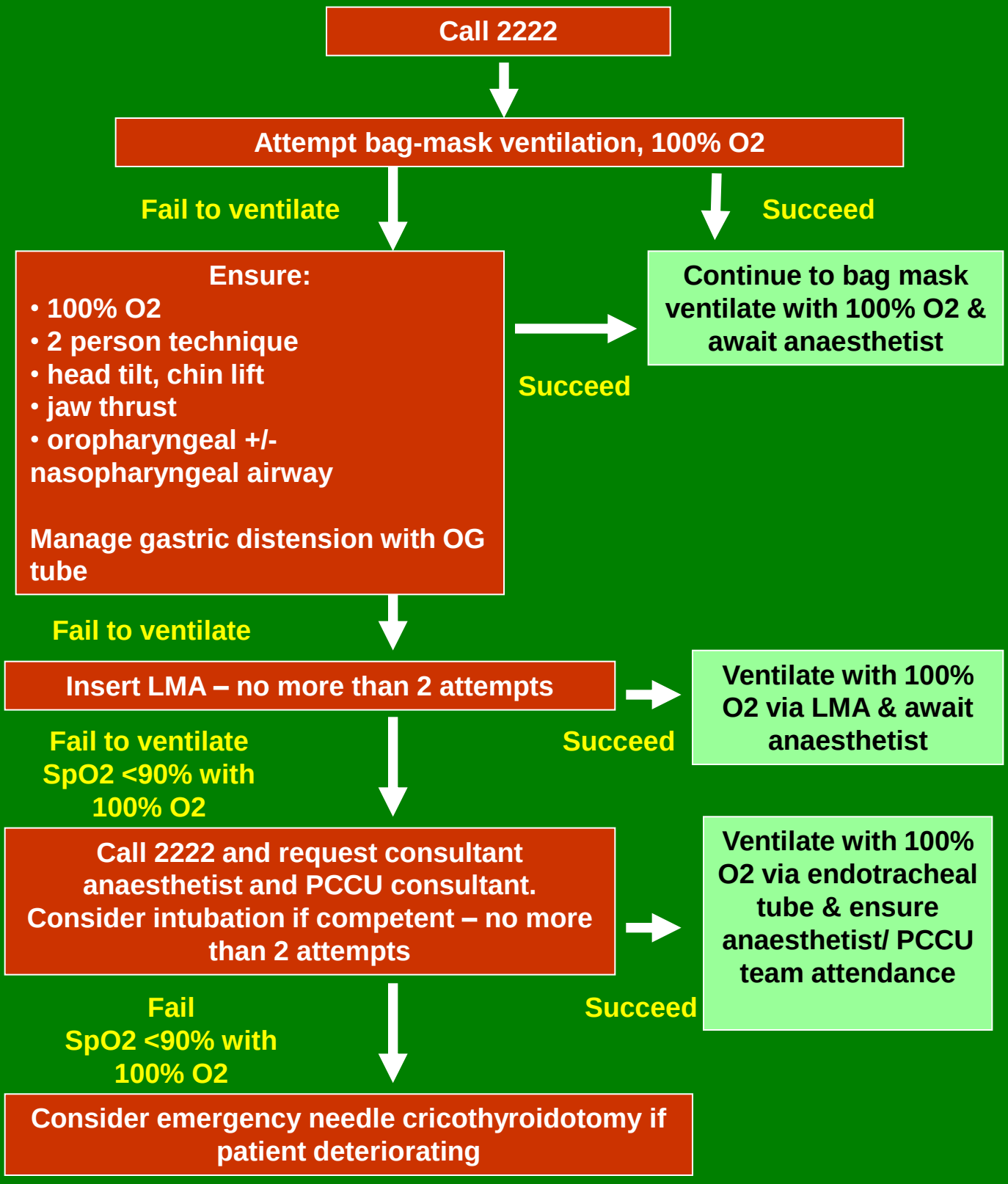
1 minute BLS

Ensure **Help** is on the way – call **2222** or **999**

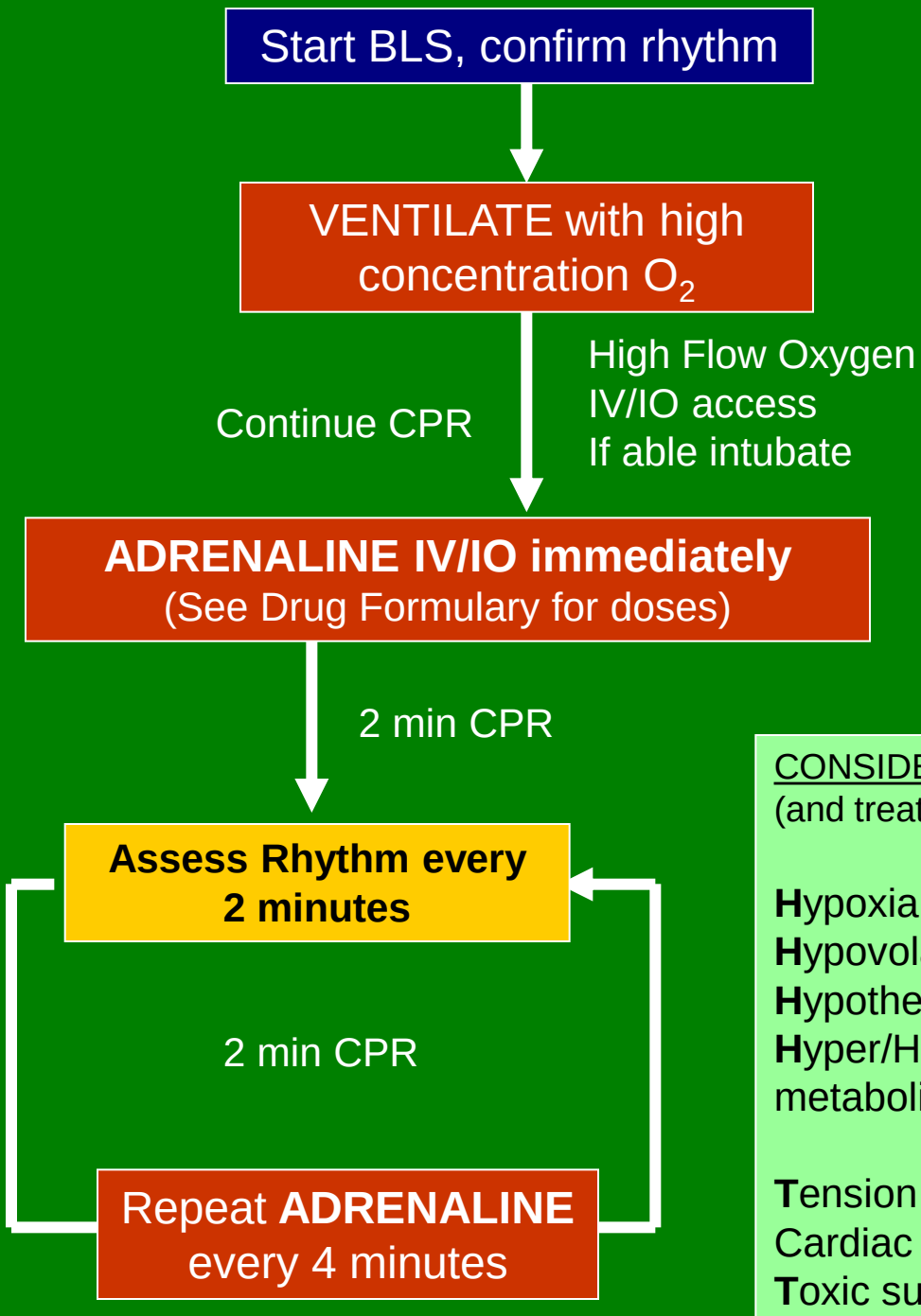
* If unable to insert tube then try a smaller tube. Don't make repeated attempts to insert either size tube. In non-breathing patient the priority is to ventilate the patient, so call 2222 or 999 and provide life support via mouth/nose or endotracheal tube.

SCH - Can't ventilate guidelines

For unresponsive, apnoeic patients with no anaesthetist



Asystole and PEA



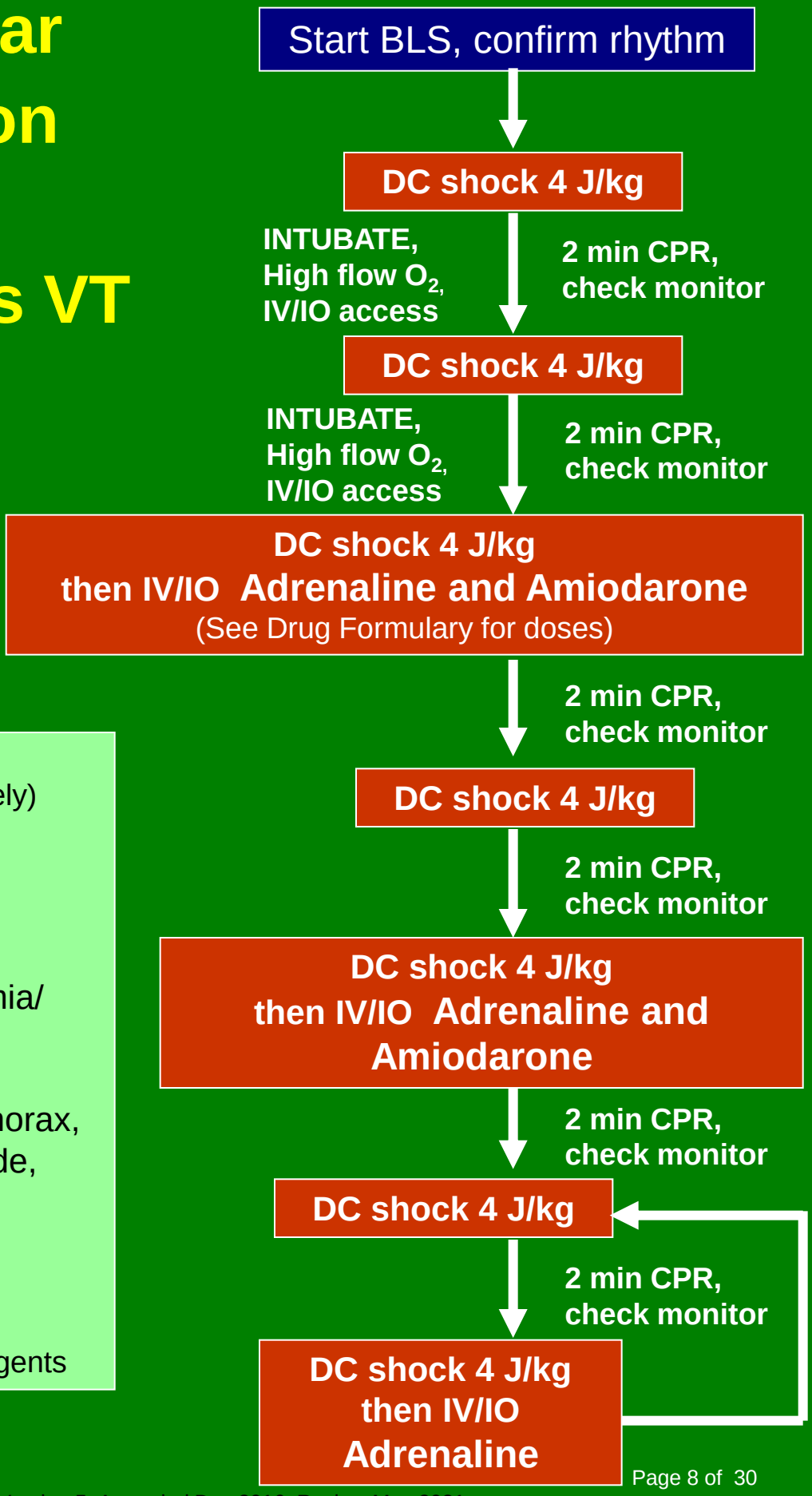
CONSIDER
(and treat appropriately)

Hypoxia,
Hypovolaemia,
Hypothermia,
Hyper/Hypokalaemia/ metabolic

Tension Pneumothorax,
Cardiac **T**amponade,
Toxic substances,
Thromboembolic phenomena

Consider alkalising agents

Ventricular Fibrillation & Pulseless VT



CONSIDER
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Consider alkalising agents

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Defibrillation

- Use **Single** shocks with 2 min CPR in between each shock
- Use energy level of 4J/kg throughout – up to a weight of 50 kg
- Above 50 kg – use Adult guidelines

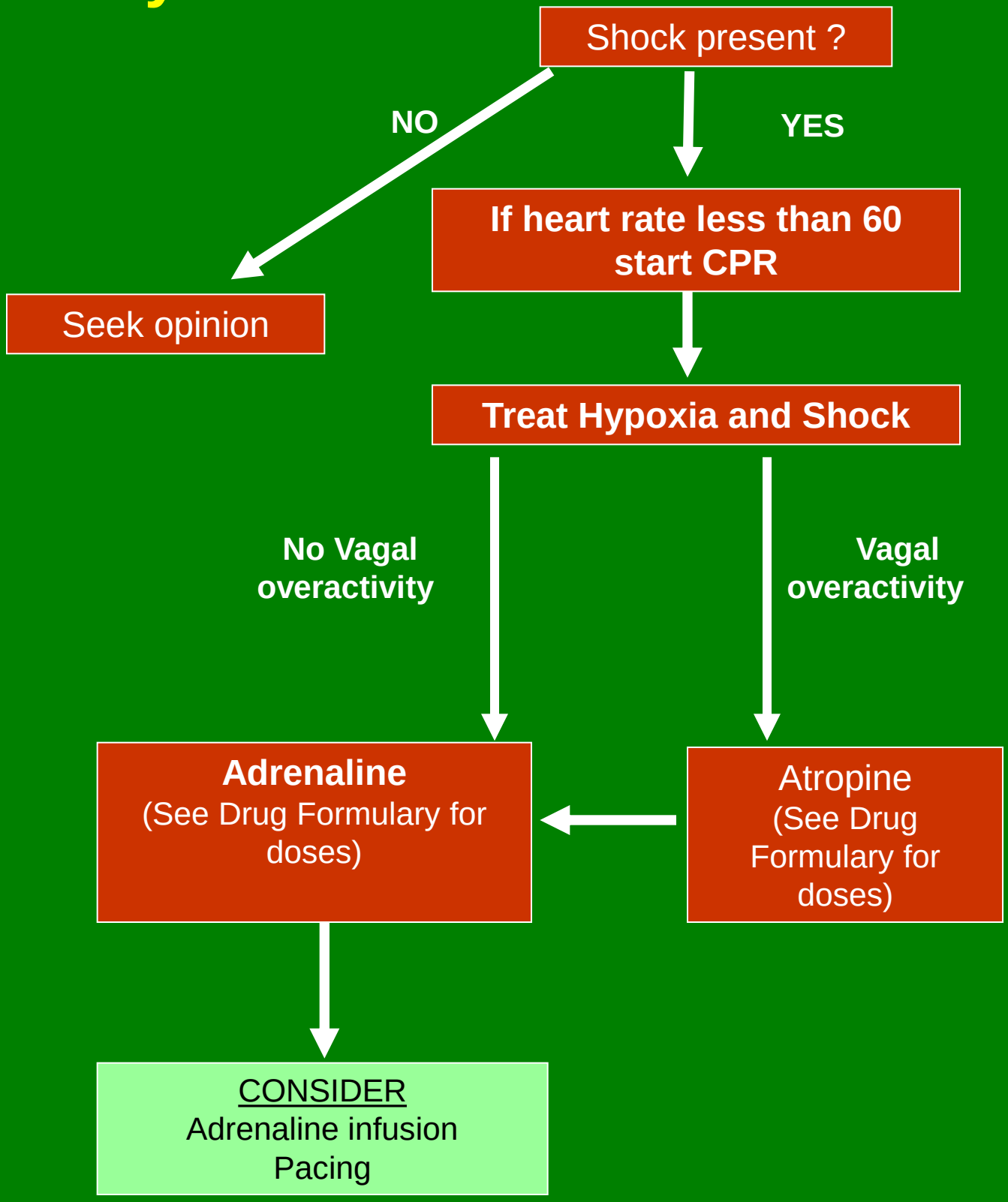
Adult guidelines

Zoll R series defibrillator - adult shocks are given at 120J, 150J, 200J.
Maximum dose 200J.

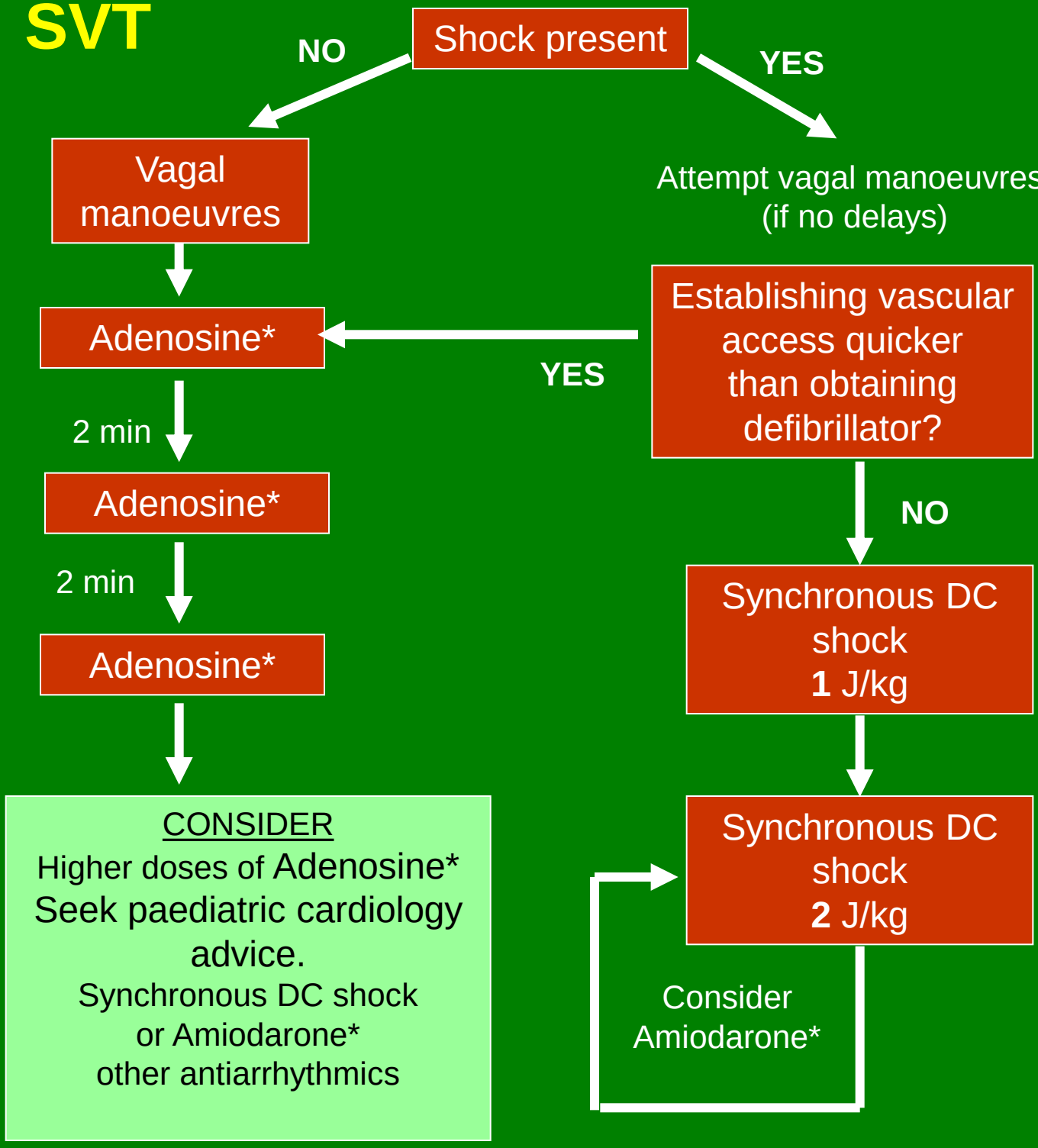
Lifepak 20/20e - 1st adult shock is 150-200 J followed by 2nd and subsequent shocks 150-360 J.

- **Internal** paddles are kept in ED resus.
- **External** pacing is provided using the Hands-free pads available with all defibrillators.

Bradycardia

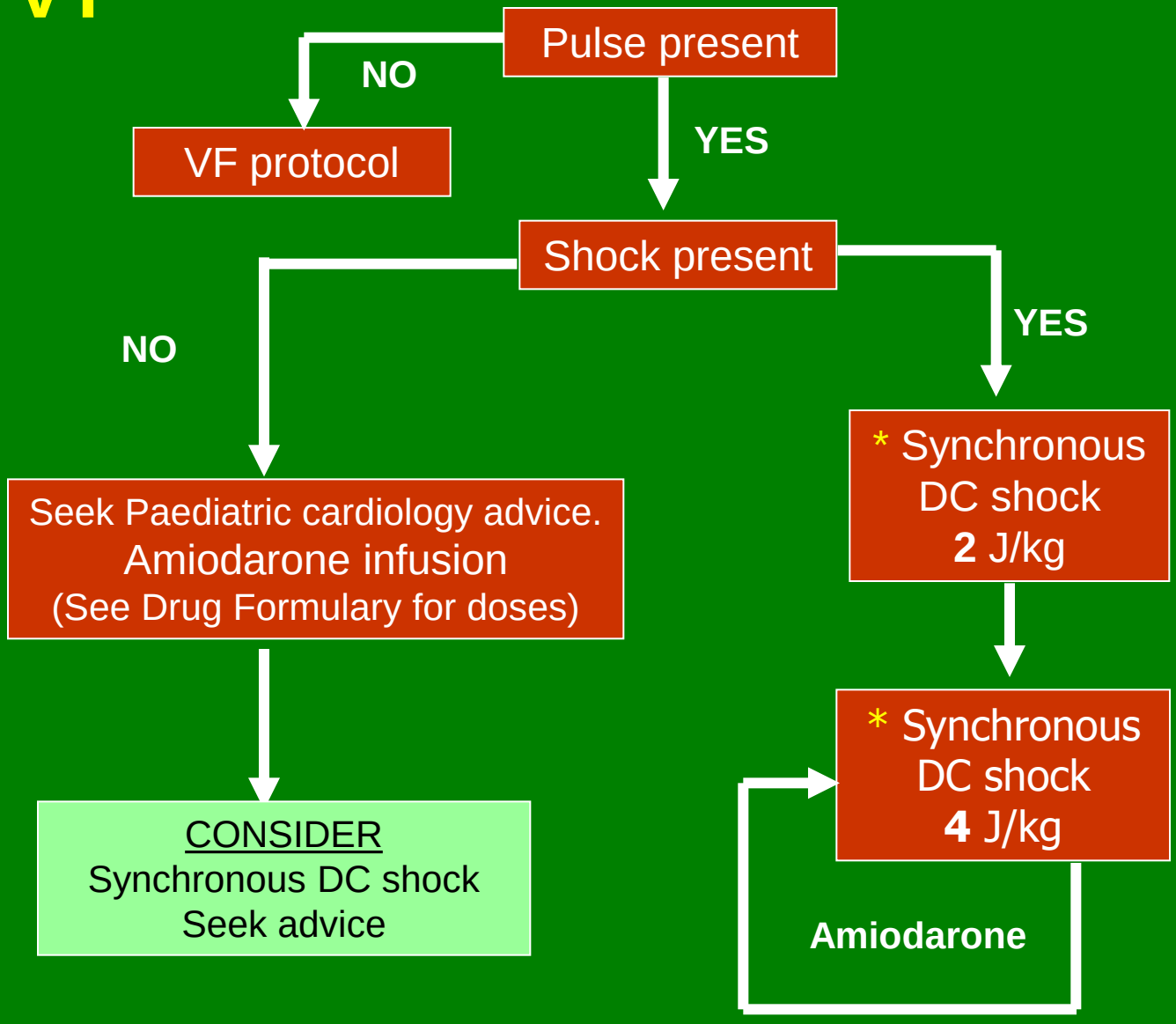


SVT



*(**Adenosine -** See Drug Formulary for contraindications and doses)

VT

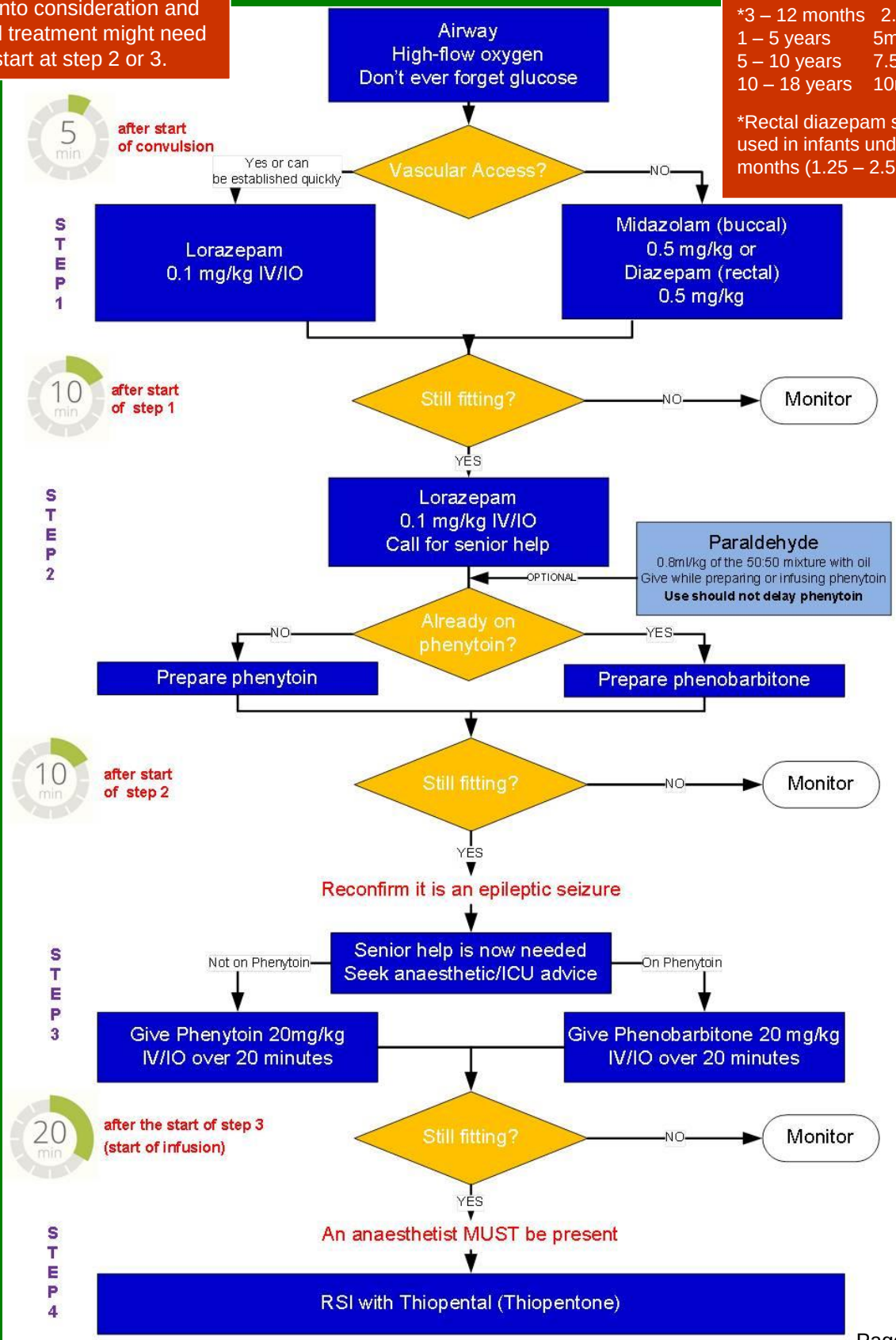


*** If Synchronous shocks are ineffective consider Asynchronous shocks as it may not be possible for the defibrillator to deliver a synchronised shock in VT due to a lack of recognisable QRST complexes**

Torsade de pointes – treatment is emergency defibrillation (synchronised) followed by magnesium sulphate and possibly Lidocaine.

Note this algorithm starts from the beginning of the seizure so pre hospital treatment **must** be taken into consideration and hospital treatment might need to start at step 2 or 3.

Status Epilepticus



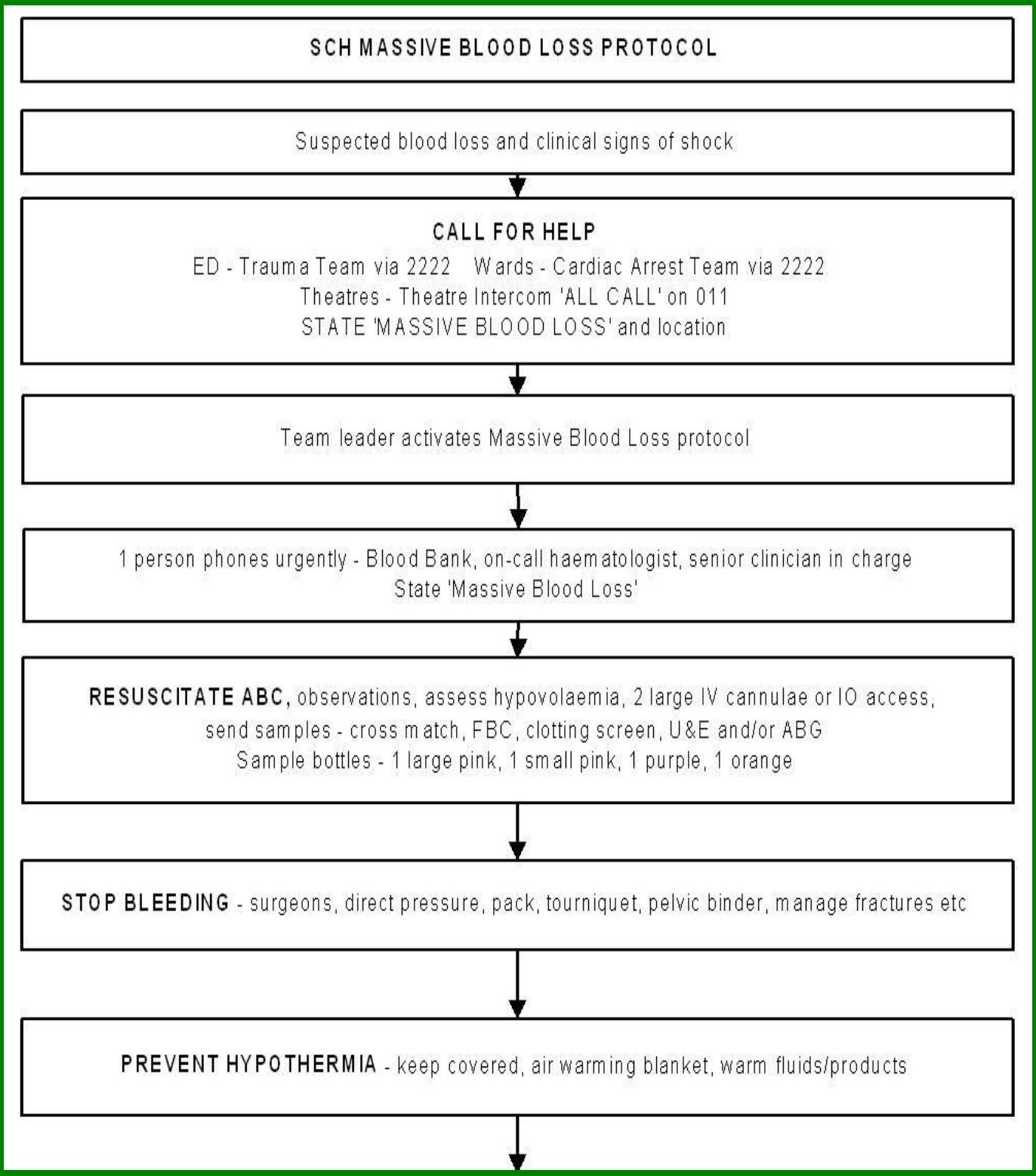
Buccal Midazolam

To ease administration, doses are rounded according to age;

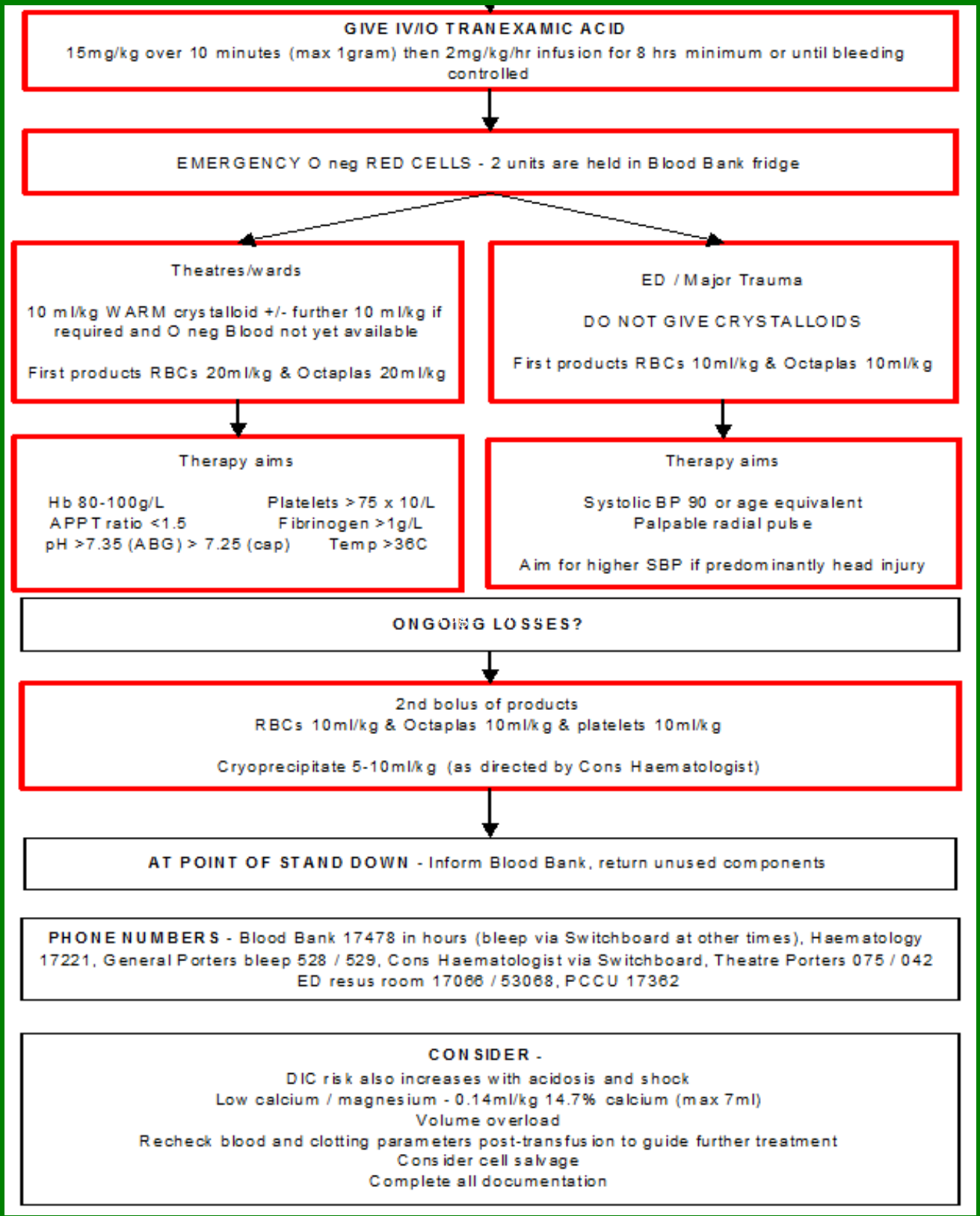
*3 – 12 months	2.5mg
1 – 5 years	5mg
5 – 10 years	7.5mg
10 – 18 years	10mg

*Rectal diazepam should be used in infants under 3 months (1.25 – 2.5mg)

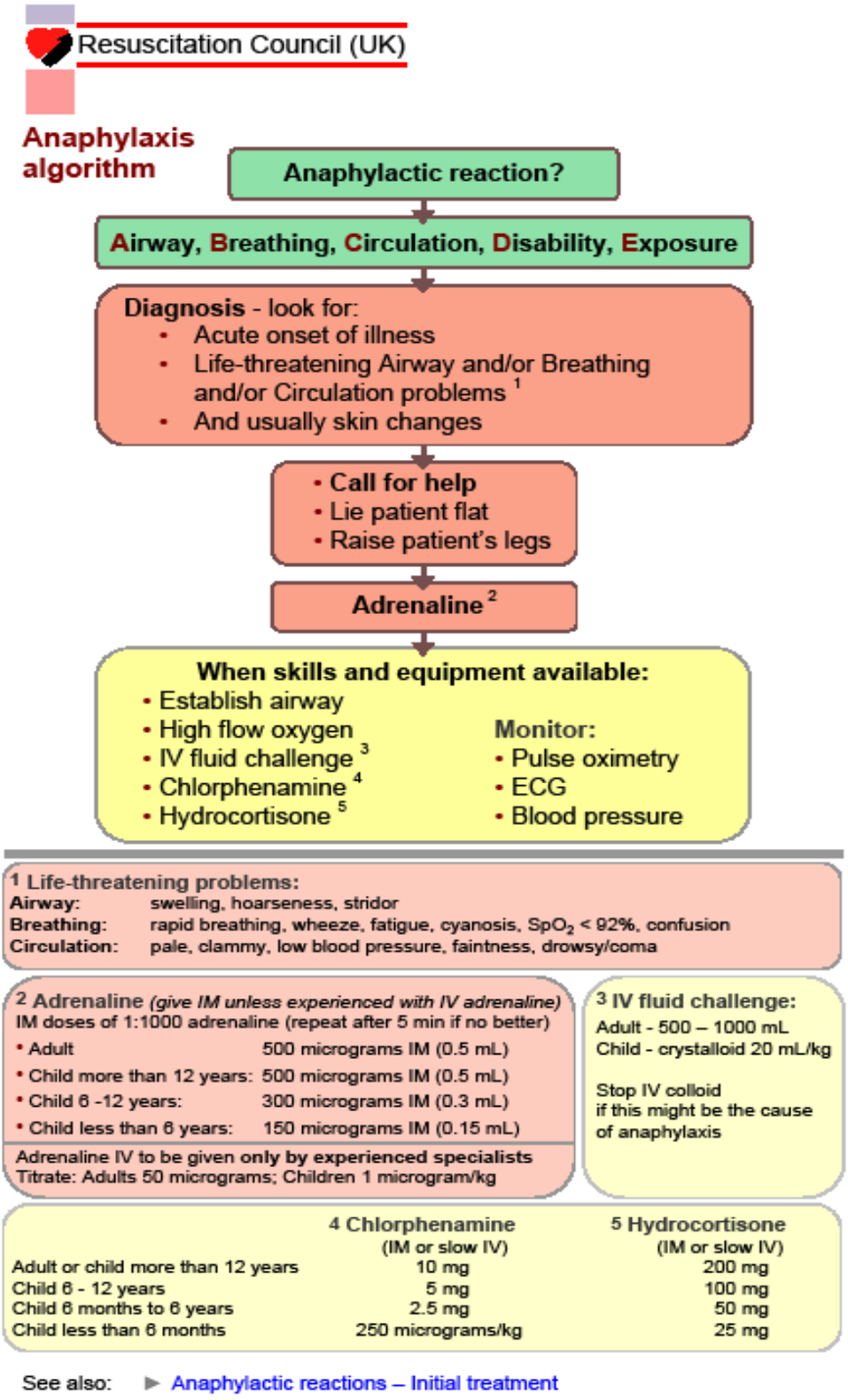
Massive Blood Loss



Massive Blood Loss



Anaphylaxis



Calculations

Weight (kg)	**Under 1 year**	**(0.5 x age in months) + 4**
	Over 1 year	**(Age in years +4) x 2**

E.T.T.	**Diameter (mm)**		**$\frac{\text{AGE}}{4}$ + 4**
	Length (cm)	**Oral**	**$\frac{\text{AGE}}{2}$ + 12**
		Nasal	**$\frac{\text{AGE}}{2}$ + 15**
	Pre-Term		**2.5mm**
	Neonate		**3.0 - 3.5mm**

B.P.	**Systolic**	**85 + (age in years x 2)**

Fluids	
General use	**20 ml/kg**
Trauma, DKA or cardiac	**10 ml/kg reassess and repeat as necessary**

Drug Formulary

Neonatal (Birth - 1 month) Drug Doses 1

DRUG	INDICATIONS	DOSAGE	NOTES
Adenosine (monitor ECG)	**SVT**	**150 microgram/kg IV IO.** **If necessary repeat every 1-2 minutes increasing dose by 50 - 100 microgram/kg until tachycardia terminates or max. single dose of 300 micrograms/kg given**	**Rapid intravenous injection - give over 2 seconds into central or large peripheral vein followed by rapid Sodium Chloride 0.9% flush**
Adenosine contraindications: Asthma; decompensated heart failure; long QT syndrome; second- or third-degree AV block and sick sinus syndrome (unless pacemaker fitted); severe hypotension Children with heart transplant very sensitive to effects of Adenosine and should not receive higher initial doses. In children receiving Dipyridamole reduce dose to a quarter usual dose of Adenosine.			
Adrenaline	**Asystole** **VF** **PEA** **Bradycardia**	**1st Dose: 10 microgram/kg (0.1ml/kg) 1:10,000 IV IO** **Subsequent doses: 10-30 microgram/kg (0.1-0.3ml/kg) 1:10,000 IV IO** **(Maximum dose 1mg)**	**All IV/IO Adrenaline doses must be flushed with 5mls of 0.9% Sodium Chloride after each dose** **Endotracheal route is accepted but has unproven effectiveness in resuscitation at birth.**
Adrenaline	**Anaphylaxis**	**0.15 ml 1:1000 IM (150 microgram)**	**Repeat at 5 min intervals according to clinical response**
	Croup or post-extubation stridor	**400 microgram/kg** **0.4 ml/kg 1:1,000 Nebulised** **(Maximum dose 5mg)**	**If necessary dilute to nebulise with 0.9% Sodium Chloride**
IM Adrenaline in Anaphylaxis – caution with β blockers - Severe anaphylaxis in patients taking beta-blockers may not respond to adrenaline—consider bronchodilator therapy. Furthermore, adrenaline can cause severe hypertension and bradycardia in those taking non-cardioselective beta-blockers.			
Amiodarone **(Use only on advice)** (monitor ECG)	**Shock Resistant VF** **Pulseless VT**	**5mg/kg IV IO** **Bolus over at least 3 min**	**Dilute in 5% Glucose to a concentration of 15mg/ml**
	Pulsed VT **SVT**	**5mg/kg IV IO Infusion over 30 minutes** **Then 5 mg/kg over 30 min every 12 – 24 hours**	**Dilute in 5% Glucose to a concentration not less than 600 micrograms/ml**
Amiodarone – recommended for administration by central line if possible.			
Atropine	**Intraoperative Bradycardia**	**10 – 20 microgram/kg IV IO (20microgram/kg ETT)** **(Minimum dose 100 microgram)**	**Bolus over 1 min**
Calcium Gluconate 10%	**Acute hypocalcaemia and hyperkalaemia**	**0.5 ml/kg IV IO**	**Slow IV injection over 5 – 10 min**
Chlorphenamine	**Anaphylaxis**	**250 microgram/kg IV IO**	
Diazepam (IV)	**Convulsions**	**0.3mg/kg IV IO**	**Over 3 – 5 min.** **If Lorazepam not available**
Diazepam (PR)	**Convulsions**	**1.25 - 2.5mg PR**	

Neonatal (Birth - 1 month) Drug Doses 2

DRUG	INDICATIONS	DOSAGE	NOTES
Glucose 10%	Hypoglycaemia	2ml/kg IV IO	Repeat if necessary or start infusion
Hydrocortisone	Anaphylaxis	25mg IV IO	
Lorazepam	Convulsions	0.1mg/kg IV IO Limited experience in neonates.	Give over 30 – 60 seconds and flush with 5ml 0.9% Sodium Chloride. Repeated once after 10 min if necessary. May cause apnoea. Flumazenil is an antidote.
Mannitol	Raised ICP	0.25 – 0.5 g/kg (1.25 – 2.5 ml/kg of 20% solution)	Infusion over 30 min via 5 micron filter. Single dose.
Naloxone	Reversal of opiate in resuscitation situation	Initially 100 micrograms/kg, if no response, repeat at intervals of 1 minute to a total max. 2mg	See line below.
In patients on long term opiates in whom complete reversal of analgesia, or precipitation of acute withdrawal may be dangerous, a lower dose of 4 micrograms/kg should be used initially (max 200 micrograms). Naloxone is very rarely indicated in patients receiving End of Life care (e.g. accidental 10 fold overdose with respiratory depression), but if required, the low dose regimen should be used.			
Paraldehyde	Convulsions	0.8ml/kg PR of prepared diluted solution (Maximum dose 20mls)	(Paraldehyde + olive oil mixed 1:1)
Phenobarbital	Convulsions	20mg/kg IV IO loading dose (Maximum dose 1 g)	Dilute with water for injection to 20mg/ml. Infuse over 20 min.
Phenytoin (monitor ECG and BP)	Convulsions	20mg/kg IV IO loading dose Infuse over 20 - 30 minutes.	Central lines and PICC lines – use NEAT (no need to filter) Peripheral lines - dilute to 10mg/ml only with Sodium Chloride 0.9% and administer through 0.22 – 0.5 micron filter Always administer with a large 0.9% Sodium Chloride flush
Sodium Bicarbonate	Acidotic states hyperkalaemia	1mmol/kg (1ml/kg of 8.4%) IV IO	
Sodium Chloride 2.7% or 3%	Raised ICP	3-5ml/kg IV or IO	Infuse over 15 min Single dose
Thiopental	Anaesthetic induction	2- 4 mg/kg IV IO	
Tranexamic Acid	Massive Blood Loss	15 mg/kg over 10 minutes (Maximum dose 1gram)	Then 2 mg/kg/hr infusion for 8 hours minimum or until bleeding controlled.

Child (1 month - 12 years) Drug Doses 1

DRUG	INDICATIONS	DOSAGE	NOTES
Adenosine (monitor ECG)	**SVT**	**1 month to 1 year 150 microgram/kg IV IO.** **1 – 12 year 100 microgram/kg IV IO.** **If necessary repeat every 1-2 minutes increasing dose by 50 - 100 microgram/kg until tachycardia terminates or max. single dose of 500 microgram/kg given (Maximum dose 12 mg)**	**Rapid intravenous injection - give over 2 seconds into central or large peripheral vein followed by rapid Sodium Chloride 0.9% flush**
Adenosine contraindications: Asthma; decompensated heart failure; long QT syndrome; second- or third-degree AV block and sick sinus syndrome (unless pacemaker fitted); severe hypotension Children with heart transplant very sensitive to effects of Adenosine and should not receive higher initial doses. In children receiving Dipyridamole reduce dose to a quarter usual dose of Adenosine.			
Adrenaline	**Asystole** **VF** **PEA** **Bradycardia**	**10 microgram/kg (0.1ml/kg)** **1:10,000 IV IO** Outside the neonatal period doses over 10 microgram/kg may be disadvantageous except in the rare circumstances of cardiac arrest following β blocker overdoses **(Maximum dose 1mg)**	**All IV/IO Adrenaline doses must be flushed with 10mls of 0.9% Sodium Chloride after each dose**
		100 microgram/kg (0.1 ml/kg) **1:1000 *ETT***	The use of adrenaline given by ET bolus has not convincingly been shown to be effective. The IV/IO approach is preferred where possible.
Adrenaline	**Anaphylaxis**	**< 6 yrs 0.15 ml 1:1000 IM (150 micrograms)** **6-12 yrs 0.3 ml 1:1000 IM (300 micrograms)**	**Repeat at 5 min intervals according to clinical response**
	Croup or post-extubation stridor	**400 microgram/kg (Max 5mg)** **0.4 ml/kg 1:1,000 Nebulised** **(Maximum dose 5mg)**	**If necessary dilute to nebulise with 0.9% Sodium Chloride**
IM Adrenaline in Anaphylaxis – caution with β blockers - Severe anaphylaxis in patients taking beta-blockers may not respond to adrenaline—consider bronchodilator therapy. Furthermore, adrenaline can cause severe hypertension and bradycardia in those taking non-cardioselective beta-blockers.			

Child (1 month - 12 years) Drug Doses 2

DRUG	INDICATIONS	DOSAGE	NOTES
Amiodarone (monitor ECG)	**Shock Resistant VF** **Pulseless VT**	**5mg/kg IV IO (Maximum 300mg)** **Bolus over at least 3 min**	**Dilute in 5% Glucose to a concentration of 15mg/ml**
	Pulsed VT **SVT**	**5 – 10 mg/kg IV IO Infusion over 20 - 120 minutes** **(Max 1.2g in 24 hours)** **Then by continuous infusion 300 micrograms/kr/hr increased according to response to 1.5 mg/kg/hr.** **Do not exceed 1.2 g in 24 hours**	**Dilute in 5% Glucose to a concentration not less than 600 micrograms/ml**
Amiodarone – recommended for administration by central line if possible.			
Atropine	**Intraoperative Bradycardia**	**10 - 20 microgram/kg IV IO** **(Min 100microgram; Max 600 microgram per dose).**	**Slow IV injection over 5 – 10 min**
IF IV/IO access is unavailable, **Atropine** 40 micrograms/kg may be administered tracheally but absorption may be unreliable			
Calcium Gluconate 10%	**Acute hypocalcaemia and hyperkalaemia**	**0.5 ml/kg IV IO** **Maximum dose 20 ml**	**Slow IV injection over 5 – 10 min**
Chlorphenamine	**Anaphylaxis**	**250 microgram/kg IV IO (1 – 6 months)** **2.5 mg IV IO (6 months - 6 yr)** **5 mg IV IO (6 - 12 yr)**	
Diazepam (IV)	**Convulsions**	**0.3 mg/kg IV IO**	**Over 3 – 5 min.** **If Lorazepam not available**
Diazepam (PR)	**Convulsions**	**1.25 – 2.5mg (< 3 months)**	
Glucose 10%	**Hypoglycaemia**	**2ml/kg IV IO**	**Repeat if necessary or start infusion**
Hydrocortisone	**Anaphylaxis**	**25 mg IV IO (1 – 6 months)** **50 mg IV IO (6 months - 6 yr)** **100 mg IV IO (6 - 12 yr)**	
Lorazepam	**Convulsions**	**0.1mg/kg IV IO (Max Dose 4mg)**	**Give over 30 – 60 seconds and flush with 5ml 0.9% Sodium Chloride.** **Repeated once after 10 min if necessary.** **May cause apnoea. Flumazenil is an antidote.**
Magnesium Sulphate 10%	**Torsade de pointes**	**25 – 50mg/kg (max 2g)** **10% injection = 100mg/ml**	**IV infusion over 10 – 15 minutes**

Child (1 month - 12 years) Drug Doses 3

DRUG	INDICATIONS	DOSAGE	NOTES
Mannitol	Raised ICP	0.25 – 0.5 g/kg (1.25 – 2.5 ml/kg of 20% solution)	Infusion over 30 min via 5 micron filter Single dose
Midazolam (buccal)	Convulsions	Buccal doses; 3 – 12 months 2.5mg (yellow) 1 – 5 years 5mg (blue) 5 – 10 years 7.5mg (purple) 10 – 18 years 10mg (orange)	BUCCOLAM® pre-filled oral syringes are colour coded according to dose (nb. part syringes cannot be given) Repeat dose once after 10 minutes if necessary.
Naloxone	Reversal of opiate in resuscitation situation	Initially 100 micrograms/kg, if no response, repeat at intervals of 1 minute to a total max. 2 mg	See line below.
In patients on long term opiates in whom complete reversal of analgesia, or precipitation of acute withdrawal may be dangerous, a lower dose of 4 micrograms/kg should be used initially(max 200 micrograms). Naloxone is very rarely indicated in patients receiving End of Life care (e.g. accidental 10 fold overdose with respiratory depression), but if required, the low dose regimen should be used.			
Paraldehyde	Convulsions	0.8ml/kg PR of prepared diluted solution (Maximum dose 20mls)	(Paraldehyde + olive oil mixed 1:1)
Phenobarbital	Convulsions	20mg/kg IV IO loading dose (Maximum dose 1 g)	Dilute with water for injection to 20mg/ml. Infuse over 20 min.
Phenytoin (monitor ECG and BP)	Convulsions	20mg/kg IV IO loading dose Infuse over 20 – 30 minutes.	Central lines and PICC lines – use NEAT (no need to filter) Peripheral lines - dilute to 10mg/ml only with Sodium Chloride 0.9% and administer through 0.22 – 0.5 micron filter. Always administer with a large 0.9% Sodium Chloride flush.
Sodium Bicarbonate	Acidotic states Hyperkalaemia	1mmol/kg (1ml/kg of 8.4%) IV IO	
Sodium Chloride 2.7% or 3%	Raised ICP	3-5ml/kg IV or IO	Infuse over 15 min Single dose
Thiopental	Anaesthetic induction	4 – 7 mg/kg IV IO	
Tranexamic Acid	Massive Blood Loss	15 mg/kg over 10 minutes (Maximum dose 1 gram)	Then 2 mg/kg/hr infusion for 8 hours minimum or until bleeding controlled.

Adolescent (>12 years) Drug Doses 1

DRUG	INDICATIONS	DOSAGE	NOTES
Adenosine (monitor ECG)	**SVT**	**3 mg IV IO** **Followed by 6mg after 1-2 minutes if necessary,** **and then by 12mg after a further 1-2 minutes if necessary.**	**Rapid intravenous injection - give over 2 seconds into central or large peripheral vein followed by rapid Sodium Chloride 0.9% flush**
Adenosine contraindications: Asthma; decompensated heart failure; long QT syndrome; second- or third-degree AV block and sick sinus syndrome (unless pacemaker fitted); severe hypotension Children with heart transplant very sensitive to effects of Adenosine and should not receive higher initial doses. In children receiving Dipyridamole reduce dose to a quarter usual dose of Adenosine.			
Adrenaline	**Asystole** **VF** **PEA** **Bradycardia**	**10 microgram/kg (0.1ml/kg) 1:10,000 IV IO** **up to a maximum of 1 mg (10 ml) 1:10,000 IV IO** Outside the neonatal period doses over 10 microgram/kg may be disadvantageous except in the rare circumstances of cardiac arrest following β blocker overdoses	**All IV/IO Adrenaline doses must be flushed with 20mls of 0.9% Sodium Chloride after each dose**
		100 microgram/kg (0.1 ml/kg) **1:1000 *ETT***	The use of adrenaline given by ET bolus has not convincingly been shown to be effective. The IV/IO approach is preferred where possible.
IM Adrenaline in Anaphylaxis – caution with β blockers - Severe anaphylaxis in patients taking beta-blockers may not respond to adrenaline—consider bronchodilator therapy. Furthermore, adrenaline can cause severe hypertension and bradycardia in those taking non-cardioselective beta-blockers.			
Adrenaline	**Anaphylaxis**	**>12yrs 0.5 ml 1:1000 IM** **(500 micrograms)** **0.3ml if child is small or prepubertal**	**Repeat at 5 min intervals according to clinical response**
	Croup or post-extubation stridor	**5mg (5ml 1:1,000) Nebulised** **(Maximum dose 5mg)**	
Amiodarone (monitor ECG)	**Shock Resistant VF** **Pulseless VT**	**5mg/kg IV IO (Maximum 300mg)** **Bolus over at least 3 min**	**Dilute in 5% Glucose to a concentration of 15mg/ml**
	Pulsed VT **SVT**	**5 – 10 mg/kg IV IO Infusion over 20 - 120 minutes** **(Max 1.2g in 24 hours)** **Then by continuous infusion 300 micrograms/kr/hr increased according to response to 1.5 mg/kg/hr.** **Do not exceed 1.2 g in 24 hours**	**Dilute in 5% Glucose to a concentration not less than 600 micrograms/ml**
Amiodarone – recommended for administration by central line if possible.			

Adolescent (>12 years) Drug Doses 2

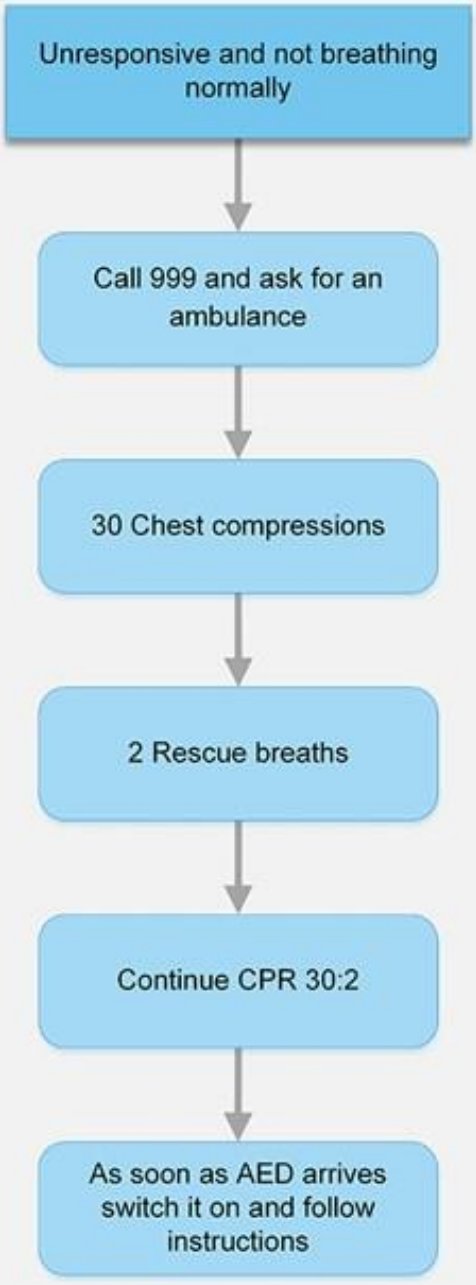
DRUG	INDICATIONS	DOSAGE	NOTES
Atropine	**Intraoperative** **Bradycardia**	**300 – 600 microgram IV IO (larger doses in emergencies)**	**Bolus over 1 min** **Repeat in 5 min**
IF IV/IO access is unavailable, **Atropine** 40 micrograms/kg may be administered tracheally but absorption may be unreliable			
Calcium Gluconate 10%	**Acute hypocalcaemia and hyperkalaemia**	**0.5 ml/kg IV IO** **Maximum dose 20 ml**	**Slow IV injection over 5 – 10 min**
Chlorphenamine	**Anaphylaxis**	**10 mg IV IO**	
Diazepam (IV)	**Convulsions**	**10 mg IV IO**	**Over 3 – 5 min.** **If Lorazepam not available**
Glucose 10%	**Hypoglycaemia**	**2ml/kg IV IO**	**Repeat if necessary** **or start infusion**
Hydrocortisone	**Anaphylaxis**	**200 mg IV IO**	
Lorazepam	**Convulsions**	**4 mg IV IO**	**Give over 30 – 60 seconds and flush with 5ml 0.9% Sodium Chloride. Repeated once after 10 min if necessary.** **May cause apnoea. Flumazenil is an antidote.**
Magnesium Sulphate 10%	**Torsade de pointes**	**25 – 50mg/kg (max 2g)** **10% injection = 100mg/ml**	**IV infusion over 10 – 15 minutes**
Mannitol	**Raised ICP**	**0.25 – 0.5 g/kg (1.25 – 2.5 ml/kg of 20% solution)**	**Infusion over 30 min via 5 micron filter** **Single dose**
Midazolam (buccal)	**Convulsions**	**Buccal dose;** **10 – 18 years 10mg (orange)**	**BUCCOLAM® pre-filled oral syringes are colour coded according to dose (nb. part syringes cannot be given)** **Repeat dose once after 10 minutes if necessary.**
Naloxone	**Reversal of opiate in resuscitation situation**	**Initially 400 micrograms, then 800 micrograms for up to 2 doses at 1 minute intervals if no response to preceding dose, then increased to 2 mg for 1 dose if still no response, then review diagnosis; further doses may be required if respiratory function deteriorates, 4 mg dose may be required in seriously poisoned patients. (See note below.)**	
In patients on long term opiates in whom complete reversal of analgesia, or precipitation of acute withdrawal may be dangerous, a lower dose of 4 micrograms/kg should be used initially (max 200 micrograms). **Naloxone is very rarely indicated in patients receiving End of Life care (e.g. accidental 10 fold overdose with respiratory depression), but if required, the low dose regimen should be used.**			

Adolescent (>12 years) Drug Doses 3

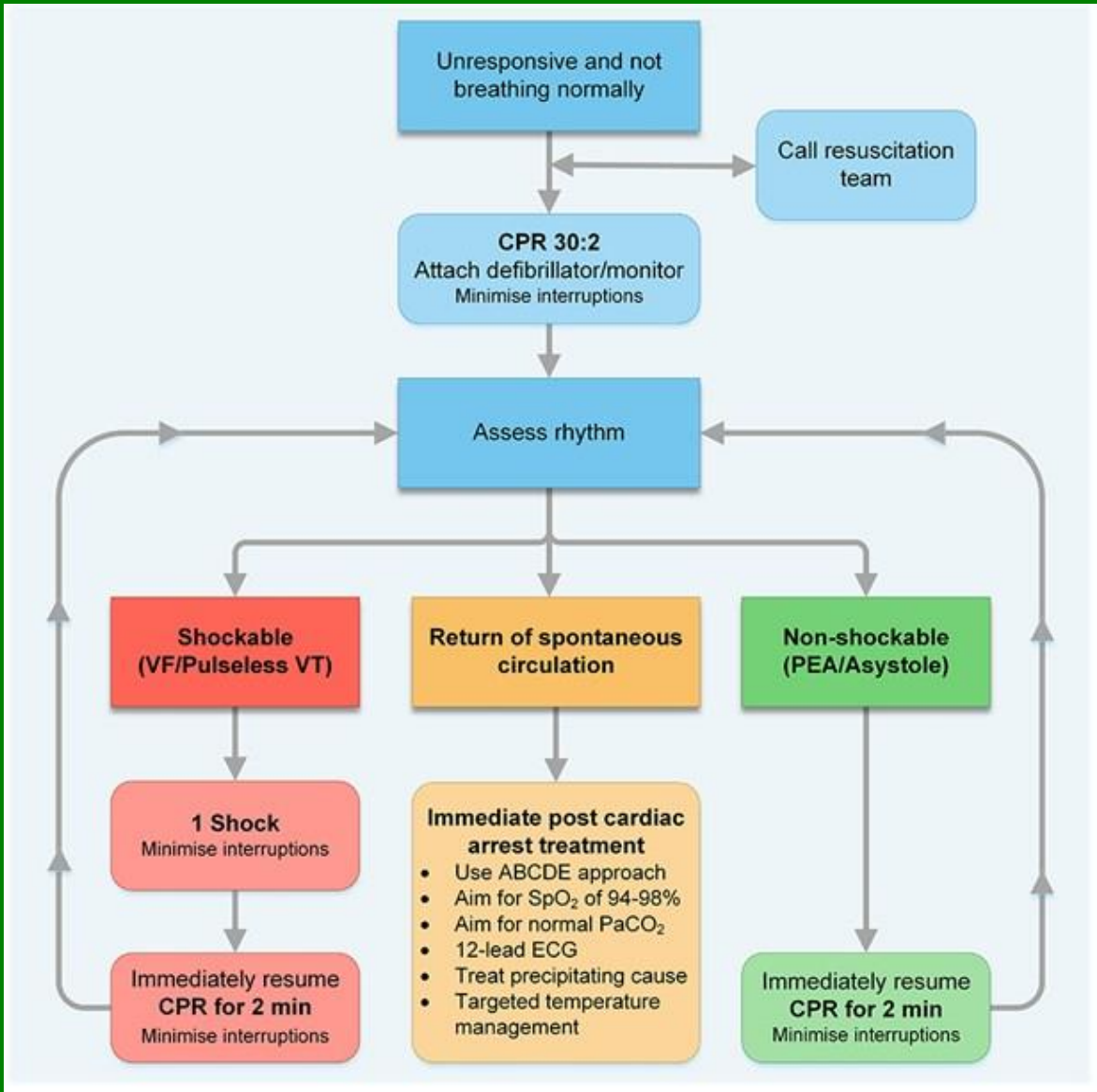
DRUG	INDICATIONS	DOSAGE	NOTES
Paraldehyde	**Convulsions**	**10-20ml PR of prepared diluted solution** **(Maximum dose 20mls)**	**(Paraldehyde + olive oil mixed 1:1)**
Phenobarbital	**Convulsions**	**20mg/kg IV IO loading dose** **(Maximum dose 1g)**	**Dilute with water for injection to 20mg/ml.** **Infuse over 20 min.**
Phenytoin (monitor ECG and BP)	**Convulsions**	**20mg/kg IV IO loading dose** **Infuse over 20 - 30 minutes.**	**Central lines and PICC lines – use NEAT (no need to filter)** **Peripheral lines - dilute to 10mg/ml only with Sodium Chloride 0.9% and administer through 0.22 – 0.5 micron filter.** **Always administer with a large 0.9% Sodium Chloride flush.**
Sodium Bicarbonate	**Acidotic states** **Hyperkalaemia**	**1mmol/kg (1ml/kg of 8.4%) IV IO**	
Sodium Chloride 2.7% or 3%	**Raised ICP**	**3-5ml/kg IV or IO**	**Infuse over 15 min** **Single dose**
Thiopental	**Anaesthetic induction**	**4 – 7 mg/kg IV IO**	
Tranexamic Acid	**Massive Blood Loss**	**15 mg/kg over 10 minutes** **(Maximum dose 1gram)**	**Then 2 mg/kg/hr infusion for 8 hours minimum or until bleeding controlled.**

ADULT LIFE SUPPORT

Adult In-hospital Basic Life Support



Adult In-hospital Advanced Life Support



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

Adult (>18 years) Drug Doses

Adult Pre filled Drug Syringes available in Green Emergency drug box in ED/PCCU/theatres/main hospital trolley

DRUG	INDICATIONS	DOSAGE	NOTES
Adrenaline	**All cardiac arrest rhythms**	**1mg IV 10ml 1:10,000**	**All IV/IO Adrenaline doses must be flushed with 20mls of 0.9% Sodium Chloride after each dose**
Adrenaline	**Anaphylaxis**	**0.5ml 1:1000 IM**	**Repeat dose after 5 min as necessary**
Amiodarone (monitor ECG)	**VF / Pulseless VT**	**300mg IV bolus**	**From a pre filled syringe (300mg in 10ml) *or* diluted in 20 ml Glucose 5%**
		Consider a further dose of Amiodarone 150 mg IV after a total of five defibrillation attempts.	
Atropine	**Symptomatic Bradycardia**	**0.5 mg IV IO**	**Repeat as necessary every 3 – 5 min to a maximum of 3 mg**

Adult (>18 years) Defibrillation

Deliver 1st shock of 150-200 J (biphasic defibrillator), followed by 2nd and subsequent shocks of 150-360 J.