

# Clinical Practice Guidelines - 2017 Edition

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## ADVANCED PARAMEDIC

AP



Pre-Hospital  
Emergency Care  
Council





These CPGs are dedicated to the memory of Dr Geoff King, the inaugural Director of the Pre-Hospital Emergency Care Council (PHECC), who sadly passed away in August 2014. Geoff was a true leader who had the ability to influence change through his own charismatic presence, vision and the respect he showed to all who met and dealt with him. He had an ability to empower others to perform and achieve to a "higher standard".

Geoff's message was consistent "If you always put the patient first when making a decision, you will never make the wrong decision".

His immense legacy is without equal.

Ní bheidh a leithéid arís ann.

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Abbey Moat House, Abbey Street, Naas, Co. Kildare, W91 NN9V, Ireland

Phone: +353 (0)45 882042

Fax: + 353 (0)45 882089

Email: [info@phecc.ie](mailto:info@phecc.ie)

Web: [www.phecc.ie](http://www.phecc.ie)

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## FOREWORD

This Handbook comprises the 2017 Edition Clinical Practice Guidelines (CPGs). These guidelines outline patient assessments and pre-hospital management for responders at Emergency First Responder-Basic Tactical Emergency Care, Emergency First Responder, First Aid Responder and Occupational First Aider levels, and registered practitioners at Emergency Medical Technician, Paramedic and Advanced Paramedic levels, and I am delighted that there are now 386 CPGs to guide integrated care across the six pre-hospital emergency care clinical levels. These CPGs ensure that responders and practitioners are practicing to best international standards and support PHECC's vision that people in Ireland receive excellent pre-hospital emergency care.



I would like to acknowledge the hard work and commitment the members of the Medical Advisory Committee have shown during the development of this publication, guided by Dr Mick Molloy (Chair). I would also like to pay tribute to the Medical Advisory Groups, chaired by Dr Cathal O'Donnell and Dr Zelig Gaffney, for their dedication and expertise in the publication of previous guidelines, during my term as Chair of Council. A special word of thanks goes to Mr Brian Power, PHECC Programme Development Officer, and the PHECC executive, for their continued support in researching and compiling these CPGs.

I recognise the contribution made by many responders and practitioners, whose feedback has assisted PHECC in the continual improvement and development of CPGs, and welcome these guidelines as an important contribution to best practice in pre-hospital emergency care.

A handwritten signature in black ink, appearing to read 'Tom Mooney', written over a horizontal line.

Mr Tom Mooney, Chair, Pre-Hospital Emergency Care Council (June 2008 – June 2016)

## ACCEPTED ABBREVIATIONS

Advanced Paramedic.....	AP
Advanced Life Support.....	ALS
Airway, Breathing & Circulation.....	ABC
All Terrain Vehicle.....	ATV
Altered Level of Consciousness.....	ALoC
Automated External Defibrillator.....	AED
Bag Valve Mask.....	BVM
Basic Life Support.....	BLS
Blood Glucose.....	BG
Blood Pressure.....	BP
Basic Tactical Emergency Care.....	BTEC
Capillary Refill Time.....	CRT
Carbon Dioxide.....	CO <sub>2</sub>
Cardiopulmonary Resuscitation.....	CPR
Cervical Spine.....	C-spine
Chronic Obstructive Pulmonary Disease.....	COPD
Clinical Practice Guideline.....	CPG
Continuous Positive Airway Pressure.....	CPAP
Degree.....	°
Degrees Centigrade.....	°C
Dextrose 10% in water.....	D <sub>10</sub> W
Dextrose 5% in water.....	D <sub>5</sub> W
Do Not Resuscitate.....	DNR
Drop (gutta).....	gtt
Electrocardiogram.....	ECG
Emergency Department.....	ED
Emergency Medical Technician.....	EMT
Endotracheal Tube.....	ETT
Foreign Body Airway Obstruction.....	FBAO
Fracture.....	#
General Practitioner.....	GP
Glasgow Coma Scale.....	GCS
Gram.....	g
Intramuscular.....	IM
Intranasal.....	IN
Intraosseous.....	IO
Intravenous.....	IV
Joules.....	J
Kilogram.....	Kg
Laryngeal Mask Airway.....	LMA

## ACCEPTED ABBREVIATIONS Continued

Mean Arterial Pressure .....	MAP
Milligram .....	mg
Millilitre .....	mL
Millimole .....	mmol
Minute .....	min
Modified Early Warning Score .....	MEWS
Motor Vehicle Collision .....	MVC
Myocardial Infarction .....	MI
Milliequivalent .....	mEq
Millimetres of mercury .....	mmHg
Nasopharyngeal airway .....	NPA
Nebulised .....	NEB
Negative decadic logarithm of the H <sup>+</sup> ion concentration .....	pH
Orally (per os) .....	PO
Oropharyngeal airway .....	OPA
Oxygen .....	O <sub>2</sub>
Paramedic .....	P
Peak Expiratory Flow Rate .....	PEFR
Per rectum .....	PR
Per vagina .....	PV
Percutaneous Coronary Intervention .....	PCI
Personal Protective Equipment .....	PPE
Pulseless Electrical Activity .....	PEA
Pulseless Ventricular Tachycardia .....	pVT
Registered Medical Practitioner .....	RMP
Registered Psychiatric Nurse .....	RPN
Respiration rate .....	RR
Return of Spontaneous Circulation .....	ROSC
Revised Trauma Score .....	RTS
Saturation of arterial Oxygen .....	SpO <sub>2</sub>
ST Elevation Myocardial Infarction .....	STEMI
Subcutaneous .....	SC
Sublingual .....	SL
Supraventricular Tachycardia .....	SVT
Systolic Blood Pressure .....	SBP
Therefore .....	∴
Total body surface area .....	TBSA
Ventricular Fibrillation .....	VF
Ventricular Tachycardia .....	VT
When necessary (pro re nata) .....	prn



## ACKNOWLEDGEMENTS

The process of developing CPGs has been long and detailed. The quality of the finished product is due to the painstaking work of many people, who through their expertise and review of the literature, ensured a world-class publication.

### PROJECT LEADER & EDITOR

Mr Brian Power, Programme Development Officer, PHECC

### REVIEW & PUBLICATION PROJECT LEADER

Mr Ricky Ellis, Programme Development Officer, PHECC

### MEDICAL ADVISOR to PHECC DIRECTOR

Mr Mark Doyle, Consultant in Emergency Medicine

### INITIAL REVIEW

Ms Jacqueline Egan, Programme Development Officer, PHECC

Ms Kathleen Walsh, Programme Development Officer, PHECC

Ms Pauline Dempsey, Programme Development Officer, PHECC

### MEDICAL ADVISORY COMMITTEE

Dr Mick Molloy (Chair), Consultant in Emergency Medicine, Wexford General Hospital

Dr Niamh Collins (Vice Chair), Consultant in Emergency Medicine, Connolly Hospital Blanchardstown

Prof. Gerard Bury, Director, UCD Centre for Emergency Medical Science

Dr Jack Collins, Senior House Officer, (EMT) representative from the PHECC register

Prof. Stephen Cusack, Consultant in Emergency Medicine, Cork University Hospital

Mr Eoghan Connolly, Advanced Paramedic, representative from the Irish College of Paramedics

Dr Conor Deasy, Consultant in Emergency Medicine, Cork University Hospital, Deputy Medical Director, HSE National Ambulance Service

Mr Michael Dineen, Paramedic, Vice Chair of Council

Mr David Hennelly, Advanced Paramedic, Clinical Development Manager, National Ambulance Service

Mr Macartan Hughes, Advanced Paramedic, Chief Ambulance Officer, Head of Education & Competency Assurance, HSE National Ambulance Service

Mr Thomas Keane, Paramedic, Member of Council

Col Gerald Kerr, Director, the Defence Forces Medical Corps

Dr Shane Knox, Assistant Chief Ambulance Officer -Education Manager, National Ambulance Service College

Mr Declan Lonergan, Advanced Paramedic, Assistant Chief Ambulance Officer, Competency Assurance, HSE National Ambulance Service

Mr Seamus McAllister, Divisional Training Officer, Northern Ireland Ambulance Service

Dr David McManus, Medical Director, Northern Ireland Ambulance Service

Dr David Menzies, Consultant in Emergency Medicine, Clinical Lead, Centre for Emergency Medical Science, University College Dublin

Mr Shane Mooney, Advanced Paramedic, Chair of Quality and Safety Committee

Mr Joseph Mooney, Paramedic, (EMT) representative from the PHECC register

Mr Tom Mooney, Chair of Council

Mr David O'Connor, Advanced Paramedic, (AP) representative from the PHECC register

Dr Peter O'Connor, Consultant in Emergency Medicine, Medical Advisor Dublin Fire Brigade

Dr Cathal O'Donnell, Consultant in Emergency Medicine, Medical Director, HSE National Ambulance Service

Mr Kenneth O'Dwyer, Advanced Paramedic, (AP) representative from the PHECC register

Mr Martin O'Reilly, Advanced Paramedic, District Officer Dublin Fire Brigade

## ACKNOWLEDGEMENTS Continued

Mr Rory Prevett, Paramedic, (P) representative from the PHECC register

Dr Neil Reddy, Medical Practitioner

Mr Derek Rooney, Advanced Paramedic, (P) representative from the PHECC register

Ms Valerie Small, Advanced Nurse Practitioner (ED), Chair of Education and Standards Committee

Dr Sean Walsh, Consultant in Paediatric Emergency Medicine, Our Lady's Hospital for Sick Children, Crumlin

### EXTERNAL CONTRIBUTORS

Mr Raymond Brady, Advanced Paramedic

Dr Seamus Clarke, General Practitioner

Mr Ray Carney, Advanced Paramedic

Mr Damien Gaumont, Advanced Paramedic

Dr Mary Higgins, Consultant Obstetrician, National Maternity Hospital

Mr David Irwin, Advanced Paramedic

Mr Danny O'Regan, Advanced Paramedic

Dr Feargal Twomey, Consultant in Palliative Medicine, University Hospital Limerick

Mr Stephen White, Advanced Paramedic

Mr Kevin Flannery, Advanced Paramedic

Mr Stephen Galvin, Paramedic

Mr Matthew Bermingham, Advanced Paramedic

Mr Alan Batt, Paramedic

Mr Alan Gaughan, Advanced Paramedic

Mr John O'Leary, Paramedic

Mr John Joe McGowan, Advanced Paramedic

Mr Damien Baldrick, Advanced Paramedic

Ms Carmel O'Sullivan, Advanced Paramedic

### SPECIAL THANKS

Ms Margaret Codd, Project Lead, Palliative Care Programme

Dr Myra Cullinane, President of the Coroners Society of Ireland

Prof. Kieran Daly, Clinical Lead, ACS Programme

Chief Superintendent Fergus Healy, An Garda Síochána

Dr Vida Hamilton, Clinical Lead, Sepsis Programme

Dr Gerry McCarthy, National Clinical Lead, Emergency Medicine Programme

Dr Katie Padfield, Consultant Anaesthetist

Dr Karen Ryan, Clinical Lead, Palliative Care Programme

Prof. Michael Turner, National Lead, HSE Clinical Programme in Obstetrics and Gynaecology

Prof. C. Anthony Ryan, University College Cork

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### MEDICATION FORMULARY REVIEW

Ms Muriel Pate, MPharm, MPSI

### EXTERNAL CLINICAL REVIEW

Mr Ray Carney, Advanced Paramedic

Mr David Finnegan, Advanced Paramedic

## INTRODUCTION

Welcome to the 2017 edition of the Clinical Practice Guidelines for pre-hospital care in Ireland. The field of pre-hospital care is still in its infancy and rapidly developing, as is evident from the 386 Clinical Practice Guidelines covering both responder and practitioner levels from Cardiac First Responder to Advanced Paramedic level.

A number of CPGs have been updated to reflect the 2015 guidelines from the International Liaison Committee on Resuscitation (ILCOR).

I would like to thank the focus groups for the substantial work they have completed on spinal injury management, which is reflected in the updated guidance on appropriate use of spinal motion restriction. Pain management has also been enhanced with the addition of Methoxyflurane and Ketamine, which will substantially improve management of pain for certain groups of patients.

We have developed a robust Delphi process for development and review of CPGs thanks to the work of Brian Power. This process prioritises those issues that are clinically important and likely to impact the widest group of patients. I would like to thank all the members of the Medical Advisory Committee for their work on this edition of the CPGs and on the Delphi process; without their input it would not have been possible to complete this body of work. It is our intention to develop or update guidelines which provide an effective and efficient practice of pre-hospital care. Feedback is welcomed on this edition and on issues you feel are not addressed but encountered in your pre-hospital practice.



A handwritten signature in dark ink, appearing to read 'mick molloy', written over a horizontal line.

Dr Mick Molloy, Chair, Medical Advisory Committee (May 2013 – June 2016)

Feedback on the CPGs may be sent to [CPG-feedback@phecc.ie](mailto:CPG-feedback@phecc.ie)

## IMPLEMENTATION

### Clinical Practice Guidelines (CPGs) and the practitioner

CPGs are guidelines for best practice and are not intended as a substitute for good clinical judgment. Unusual patient presentations make it impossible to develop a CPG to match every possible clinical situation. The practitioner decides if a CPG should be applied based on patient assessment and the clinical impression. The practitioner must work in the best interest of the patient within the scope of practice for his/her clinical level on the PHECC Register. Consultation with fellow practitioners and or medical practitioners in challenging clinical situations is strongly advised.

### The CPGs herein may be implemented provided:

1. The practitioner is in good standing on the PHECC practitioner's Register – **Credentialed**.
2. The practitioner is acting on behalf of a licensed CPG provider (paid or voluntary) – **Licensed**.
3. The practitioner is privileged by the licensed CPG provider on whose behalf he/she is acting to implement the specific CPG – **Privileged**.
4. The practitioner has received training on, and is competent in, the skills and medications specified in the CPG being utilised.

The medication dose specified on the relevant CPG shall be the definitive dose in relation to practitioner administration of medications. The principle of titrating the dose to the desired effect shall be applied. The onus rests on the practitioner to ensure that he/she is using the latest versions of CPGs, which are available on the PHECC website [www.phecc.ie](http://www.phecc.ie)

### Definitions

Adult	A patient of 16 years or greater, unless specified on the CPG
Child	A patient between 1 and less than or equal to ( $\leq$ ) 15 years old, unless specified on the CPG
Infant	A patient between 4 weeks and less than 1 year old, unless specified on the CPG
Neonate	A patient less than 4 weeks old, unless specified on the CPG
Paediatric patient	Any child, infant or neonate

### CPGs and the pre-hospital emergency care team

The aim of pre-hospital emergency care is to provide a comprehensive and coordinated approach to patient care management, thus providing each patient with the most appropriate care in the most efficient time frame.

In Ireland today, the provision of emergency care comes from a range of disciplines and includes responders (Cardiac First Responders, First Aid Responders and Emergency First Responders) and practitioners (Emergency Medical Technicians, Paramedics, Advanced Paramedics, Nurses and Doctors) from the statutory, private, auxiliary and voluntary services.

CPGs set a consistent standard of clinical practice within the field of pre-hospital emergency care. By reinforcing the role of the practitioner, in the continuum of patient care, the chain of survival and the golden hour are supported in medical and traumatic emergencies respectively.

## IMPLEMENTATION Continued

CPGs guide the practitioner in assessment, treatment and disposition of patients who present with an acute illness or injury.

CPGs presume no intervention has been applied, nor medication administered, prior to the arrival of the practitioner. In the event of another practitioner or responder initiating care during an acute episode, the practitioner must be cognisant of interventions applied and medication doses already administered and act accordingly.

In this care continuum, the duty of care is shared among all responders/practitioners of whom each is accountable for his/her own actions. The most qualified responder/practitioner on the scene shall take the role of clinical lead. Explicit handover between responders/practitioners is essential and will eliminate confusion regarding the responsibility for care.

When a practitioner of higher clinical level on scene deems it appropriate to take clinical lead he/she should calmly state: **"My name is xx, I am an AP/P/EMT, I am assuming clinical lead."**

If the practitioner of higher clinical level on scene wishes to hand over clinical lead to another practitioner (who may be of equal or lower clinical level), he/she states to the practitioner: **"My name is xx, I am an AP/P/EMT, you are now clinical lead."**

The practitioner acknowledges immediately and accepts clinical lead. **"I am now clinical lead"**

A clinical lead exchange should be recorded on the PCR in the 'continuity of care' section. There should never be any doubt as to who is clinical lead on scene.

In the absence of a more qualified practitioner, the practitioner providing care during transport shall be designated the clinical lead as soon as practical.

## Emergency Medical Technician – Basic Tactical Emergency Care (EMT-BTEC)

EMT-BTEC certifies registered EMTs with additional knowledge and a skill set for providing pre-hospital emergency care in hostile or austere environments. Recognised institutions approved at EMT level may design an EMT-BTEC module to add to new entrant EMT courses or deliver as a CPG education/upskill module to registered EMTs.

## Emergency First Response – Basic Tactical Emergency Care (EFR-BTEC)

The EFR-BTEC is an education and training standard published in 2014. Entry criteria to this course includes the minimum age of 18 and successful completion of a CFR-Advanced course within one calendar year of commencing the EFR-BTEC course. Persons certified at EFR-BTEC learn EFR and the additional knowledge and skill set for providing pre-hospital emergency care in hostile or austere environments.

## First Aid Response

First Aid Response (FAR) is a new education and training standard published in 2014. This standard offers training and certification to individuals and groups who require a first aid skill set, including cardiac first response. This standard is designed to meet basic first aid and basic life support (BLS) requirements that a certified person, known as a 'First Aid Responder', may encounter in their normal daily activities.

## IMPLEMENTATION Continued

### Defibrillation Policy

The Medical Advisory Committee has recommended the following pre-hospital defibrillation policy:

- Paramedics and advanced paramedics should use manual defibrillation for all age groups.
- EMTs and responders shall use AED mode for all age groups.

### Pre-Hospital Spinal Injury Management

The Medical Advisory Committee has recommended that 'spinal motion restriction' shall be used as the preferred terminology in relation to pre-hospital spinal injury management. They further recommend that at paramedic and advanced paramedic levels a 'spinal injury rule in' should apply and not actively performing spinal motion restriction on all trauma patients. Details of all spinal injury management recommendations are available in Appendix 6.

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## CLINICAL PRACTICE GUIDELINES for ADVANCED PARAMEDIC

### (CODES EXPLANATION)



**Emergency Medical Technician**  
(Level 4) for which the CPG pertains



An **EMT** who has completed Basic Tactical Emergency Care training and has been privileged to operate in adverse conditions



**Paramedic**  
(Level 5) for which the CPG pertains



**A parallel process**  
Which may be carried out in parallel with other sequence steps



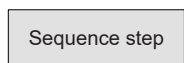
**Advanced Paramedic**  
(Level 6) for which the CPG pertains



**A cyclical process in which a number of sequence steps are completed**



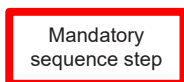
**Medical Practitioner**  
(Level 7) for which the CPG pertains



**A sequence (skill) to be performed**



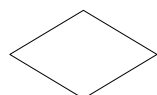
**Paramedic or lower clinical levels not permitted this route**



**A mandatory sequence (skill) to be performed**



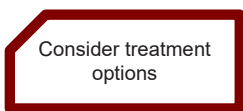
Transport to an appropriate medical facility and maintain treatment en-route



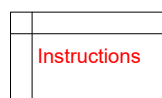
**A decision process**  
The Practitioner must follow one route



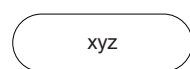
**Special authorisation**  
This authorises the Practitioner to perform an intervention under specified conditions



Given the clinical presentation consider the treatment option specified



**An instruction box for information**



Finding following clinical assessment, leading to treatment modalities



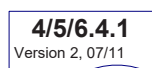
**Special instructions**  
Which the Practitioner must follow



Reassess the patient following intervention

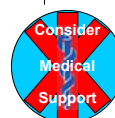
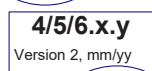


**A process or intervention that only pertains to Advanced Paramedic**

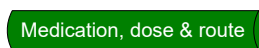


**CPG numbering system**

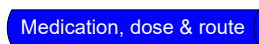
4/5/6 = clinical levels to which the CPG pertains  
x = section in CPG manual, y = CPG number in sequence  
mm/yy = month/year CPG published



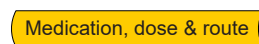
Consider medical support



**A medication which may be administered by an EMT or higher clinical level**  
The medication name, dose and route is specified



**A medication which may be administered by a Paramedic or higher clinical level**  
The medication name, dose and route is specified



**A medication which may be administered by an Advanced Paramedic**  
The medication name, dose and route is specified



**A direction to go to a specific CPG following a decision process**  
Note: only go to the CPGs that pertain to your clinical level



**A clinical condition that may precipitate entry into the specific CPG**



## SECTION 1 – Care Principles (Practitioner)

Care principles are goals of care that apply to all patients. Scene safety, standard precautions, patient assessment, primary and secondary surveys and the recording of interventions and medications on the Patient Care Report (PCR) or the Ambulatory Care Report (ACR), are consistent principles throughout the guidelines and reflect the practice of practitioners. Care principles are the foundations for risk management and the avoidance of error.

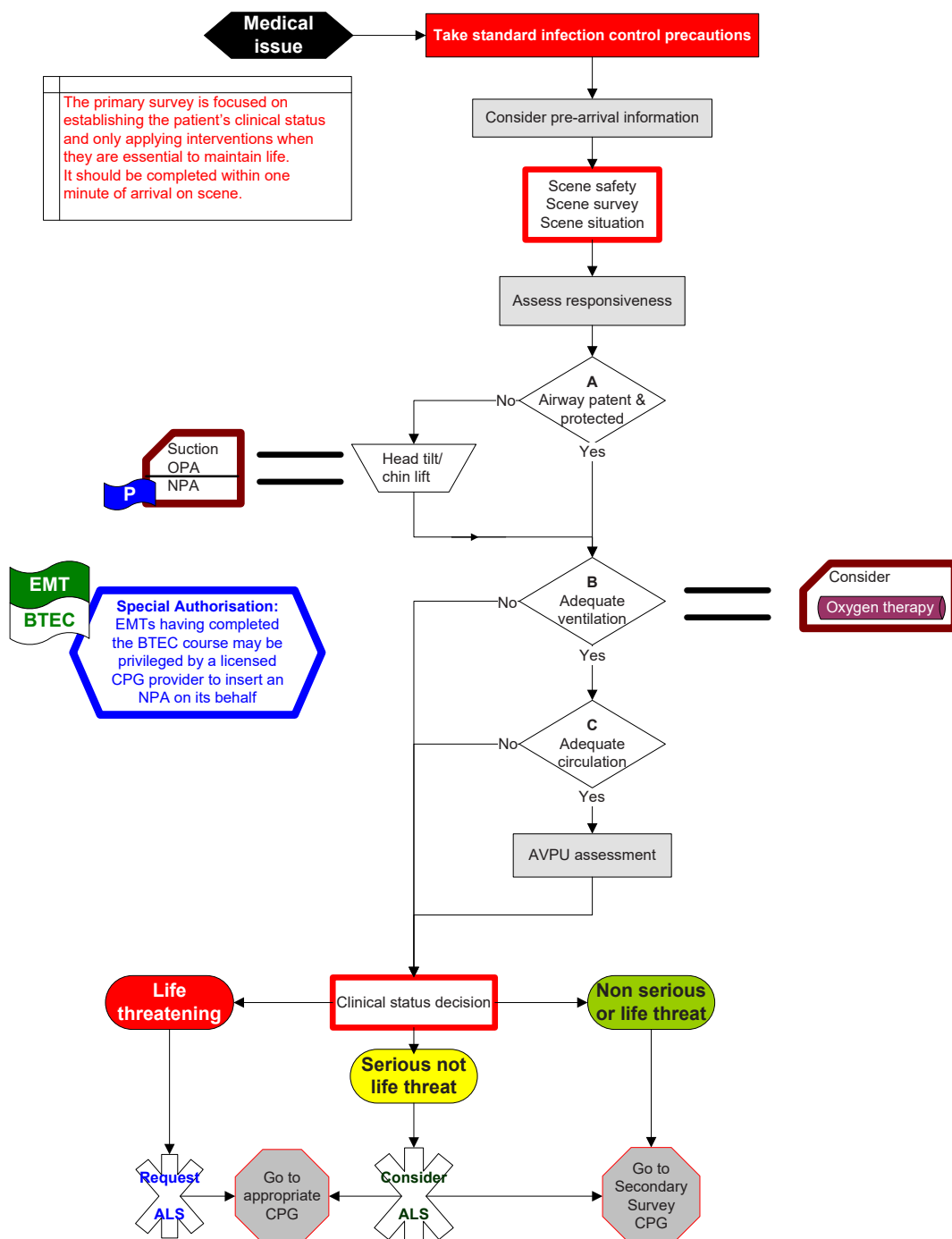
### PHECC Care Principles

1. Ensure the safety of yourself, other emergency service personnel, your patients and the public.
2. A person has capacity in respect to clinical decisions affecting themselves unless the contrary is shown (Assisted Decision-Making (Capacity) Act 2015).
3. Seek consent prior to initiating interventions and/or administering medications.
4. Identify and manage life-threatening conditions.
5. Ensure adequate ventilation and oxygenation.
6. Optimise tissue perfusion.
7. Provide appropriate pain relief within the scope of practice. Pain management;
  - 7.1 should not delay the diagnosis of conditions or injuries
  - 7.2 should be implemented for all relevant patients
  - 7.3 should commence within ten minutes on scene
  - 7.4 goal is to reduce pain to a tolerable level
  - 7.5 to take cognisance of immediate and short term pain management requirements by administering appropriate combinations of analgesia
8. Identify and manage other conditions.
9. Place the patient in the appropriate posture according to the presenting condition.
10. Ensure the maintenance of normal body temperature (unless a CPG indicates otherwise).
11. Provide reassurance at all times.
12. Monitor and record patient's vital observations.
13. Maintain responsibility for patient care until handover to an appropriate practitioner.
14. Arrange transport to an appropriate medical facility as necessary and in an appropriate time frame.
15. Complete a patient care record following an interaction with a patient.
16. Identify the clinical lead on scene; this shall be the most qualified practitioner on scene. In the absence of a more qualified practitioner, the practitioner providing care during transport shall be designated the clinical lead as soon as practical.

## SECTION 2 – Patient Assessment

4/5/6.2.1  
Version 4, 03/2016

### Primary Survey Medical – Adult



Reference: ILCOR Guidelines 2015

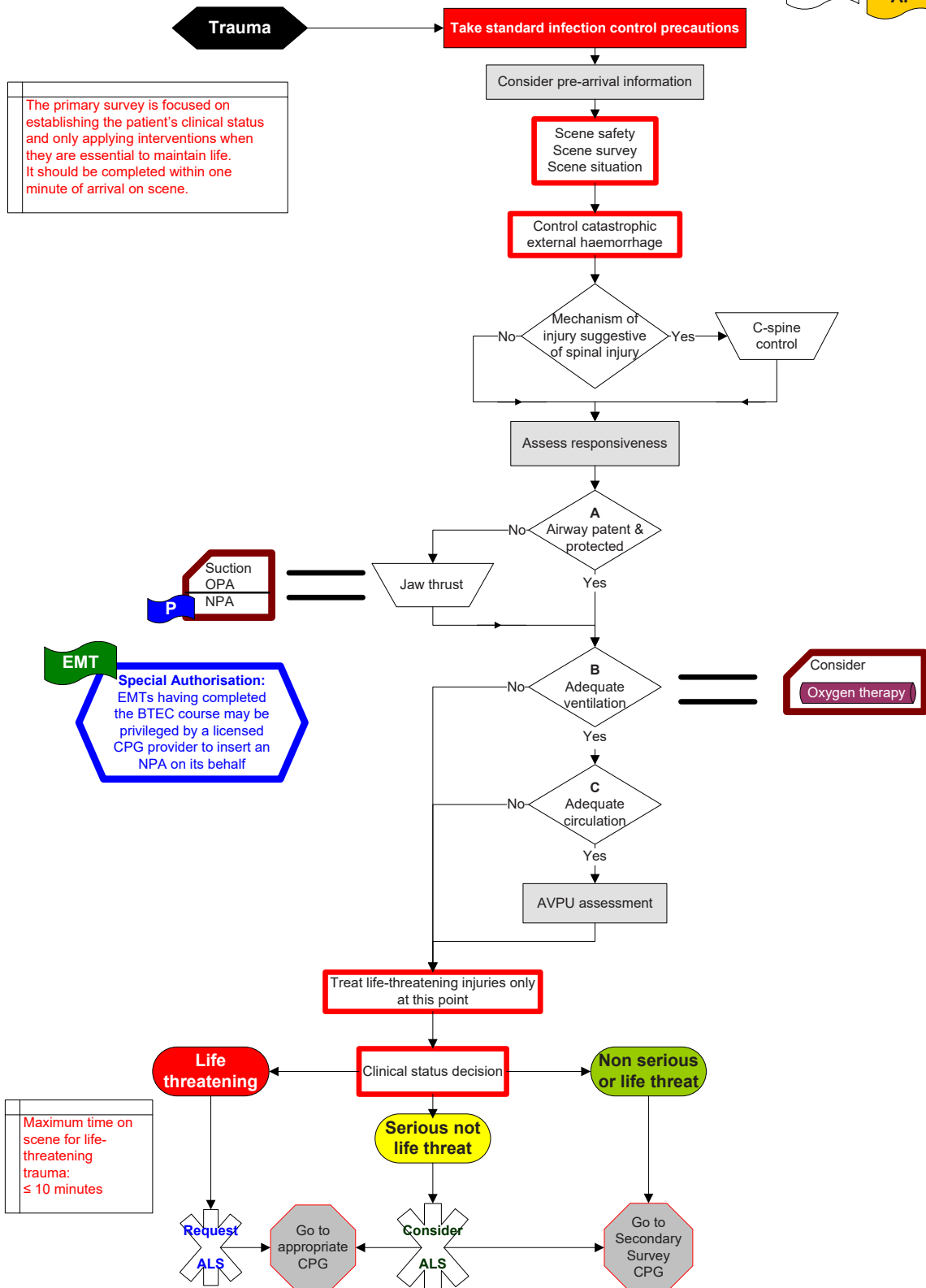
## SECTION 2 – Patient Assessment

4/5/6.2.2  
Version 4, 03/2016

### Primary Survey Trauma – Adult



The primary survey is focused on establishing the patient's clinical status and only applying interventions when they are essential to maintain life. It should be completed within one minute of arrival on scene.



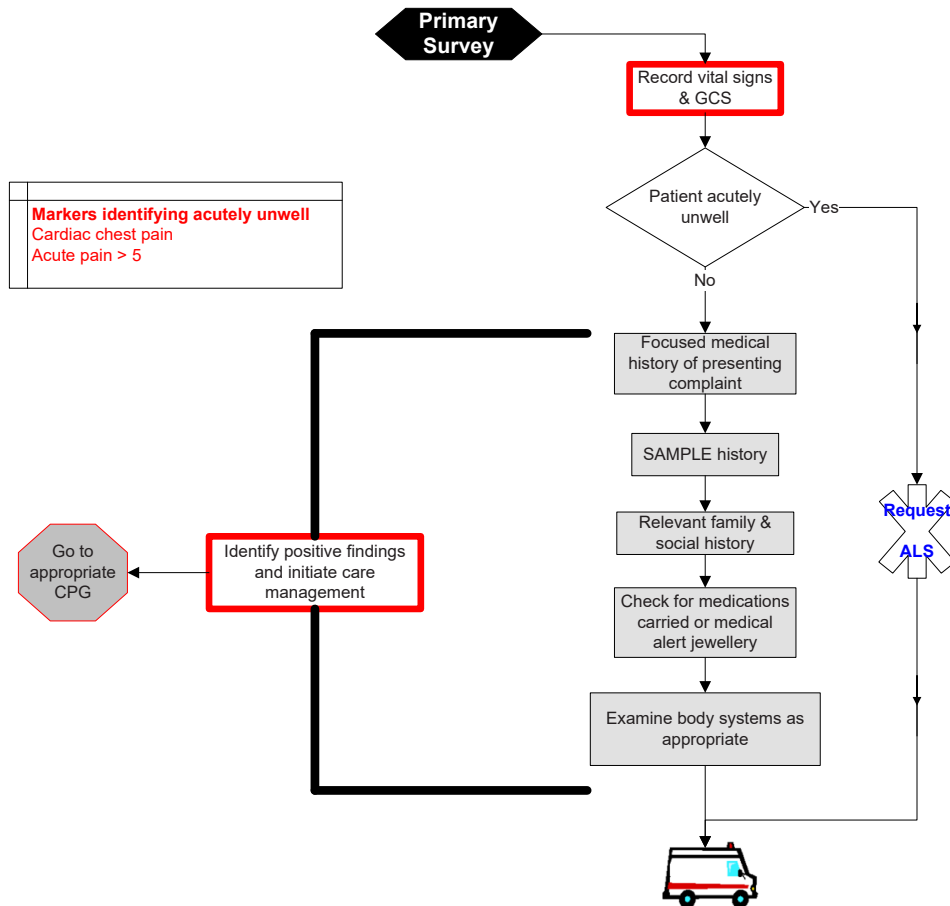
Reference: ILCOR Guidelines 2015

## SECTION 2 - Patient Assessment

5/6.2.4  
Version 2, 09/2011

### Secondary Survey Medical – Adult

P AP



Reference: Sanders, M. 2001, Paramedic Textbook 2<sup>nd</sup> Edition, Mosby  
Gleadle, J. 2003, History and Examination at a glance, Blackwell Science  
Rees, JE, 2003, Early Warning Scores, World Anaesthesia Issue 17, Article 10

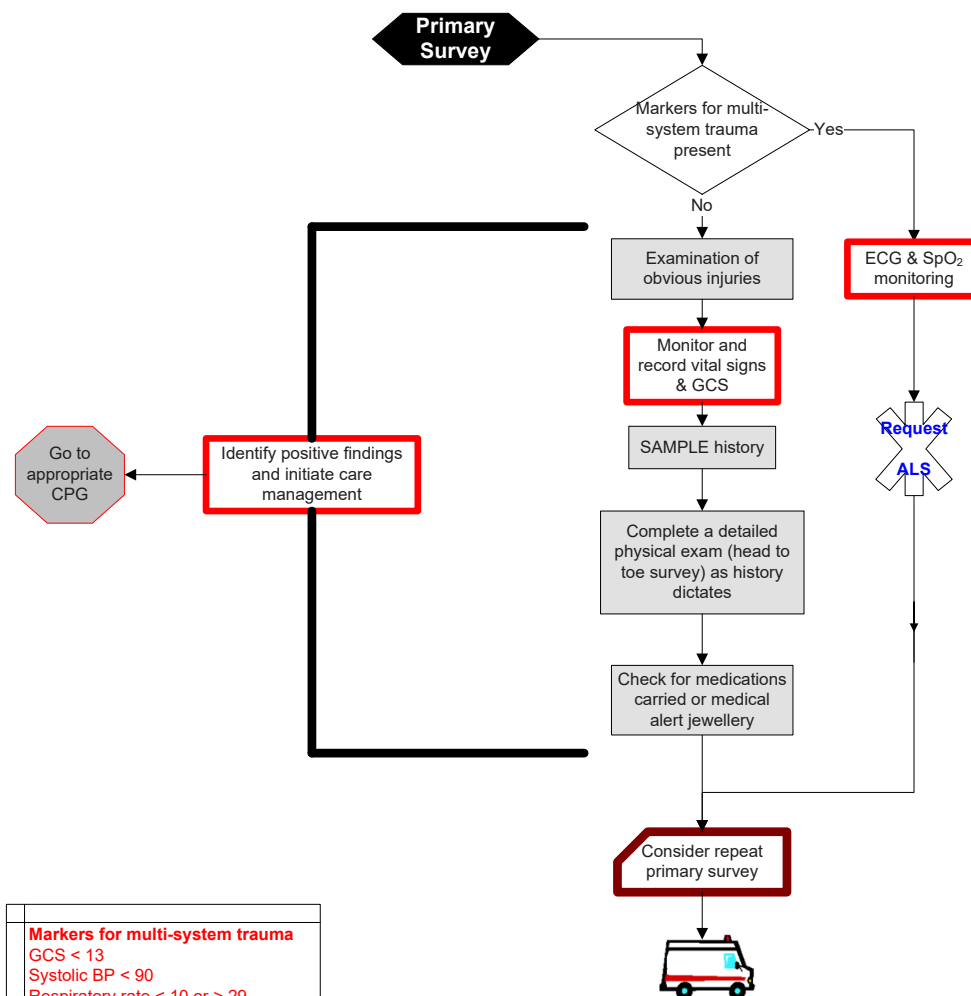
## SECTION 2 - Patient Assessment

**5/6.2.5**  
Version 2, 01/2013

### Secondary Survey Trauma – Adult

P

AP

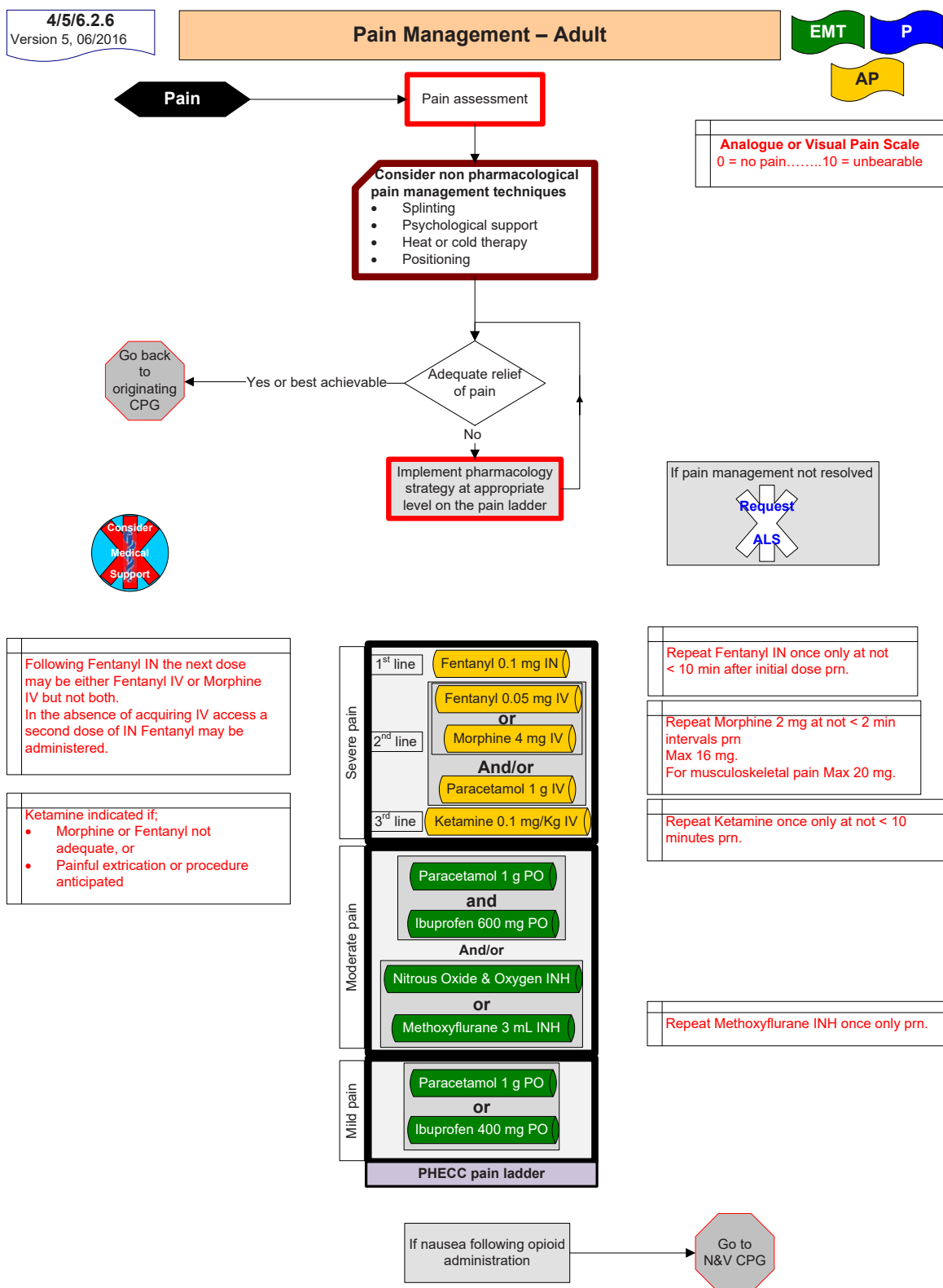


**Markers for multi-system trauma**  
GCS < 13  
Systolic BP < 90  
Respiratory rate < 10 or > 29  
Heart rate > 120  
Revised Trauma Score < 12  
Mechanism of Injury

Revised Trauma Score		
Respiratory Rate	10 – 29	4
	> 29	3
	6 – 9	2
	1 – 5	1
	0	0
Systolic BP	≥ 90	4
	76 – 89	3
	50 – 75	2
	1 – 49	1
	no BP	0
GCS	13 – 15	4
	9 – 12	3
	6 – 8	2
	4 – 5	1
	3	0
RTS = Total score		

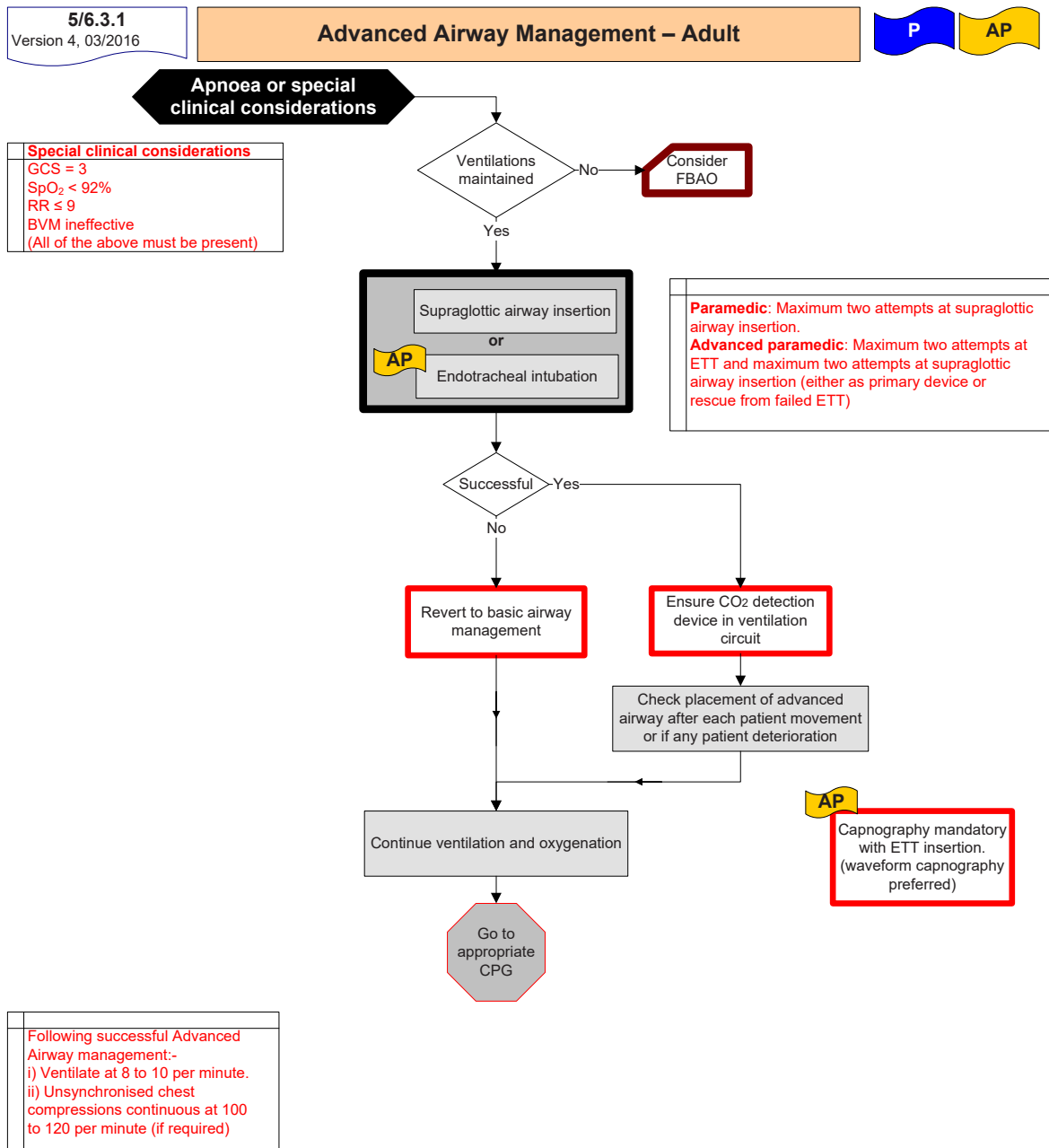
Reference: McSwain, N. et al, 2011, PHTLS Prehospital Trauma Life Support, 7<sup>th</sup> Edition, Mosby

## SECTION 2 – Patient Assessment

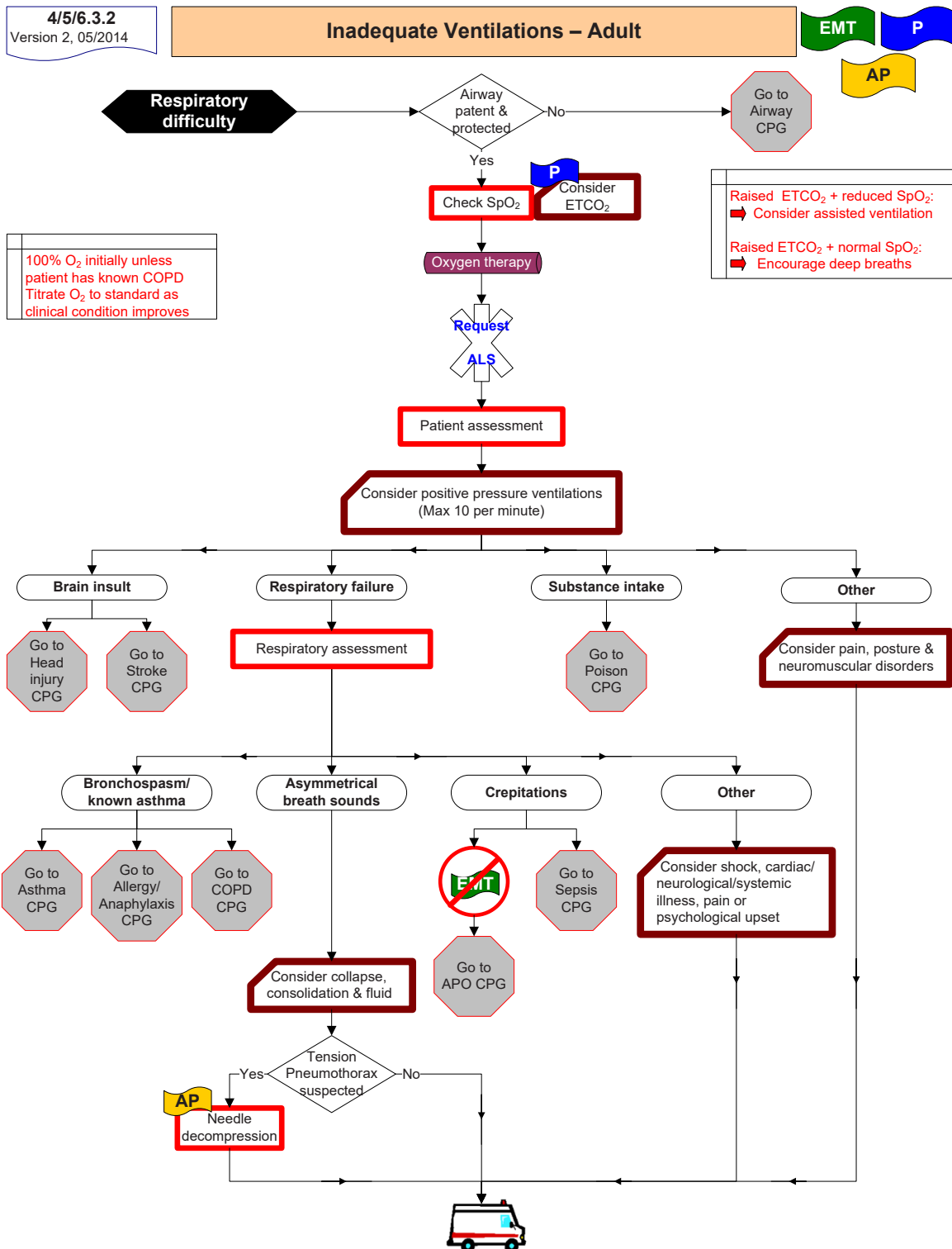


Reference: Coffey, F., et al. (2014). "STOP!": a randomised, double-blind, placebo-controlled study of the efficacy and safety of methoxyflurane for the treatment of acute pain." *Emerg Med J* 31(8): 613-618  
Jennings, P. A., et al. (2011). "Ketamine as an analgesic in the pre-hospital setting: a systematic review." *Acta Anaesthesiol Scand* 55(6): 638-643  
Park, C. L., et al. (2010). "Prehospital analgesia: systematic review of evidence." *J R Army Med Corps* 156(4 Suppl 1): 295-300  
Leung, L. (2012). "From ladder to platform: a new concept for pain management." *J Prim Health Care* 4(3): 254-258

## SECTION 3 – Respiratory Emergencies

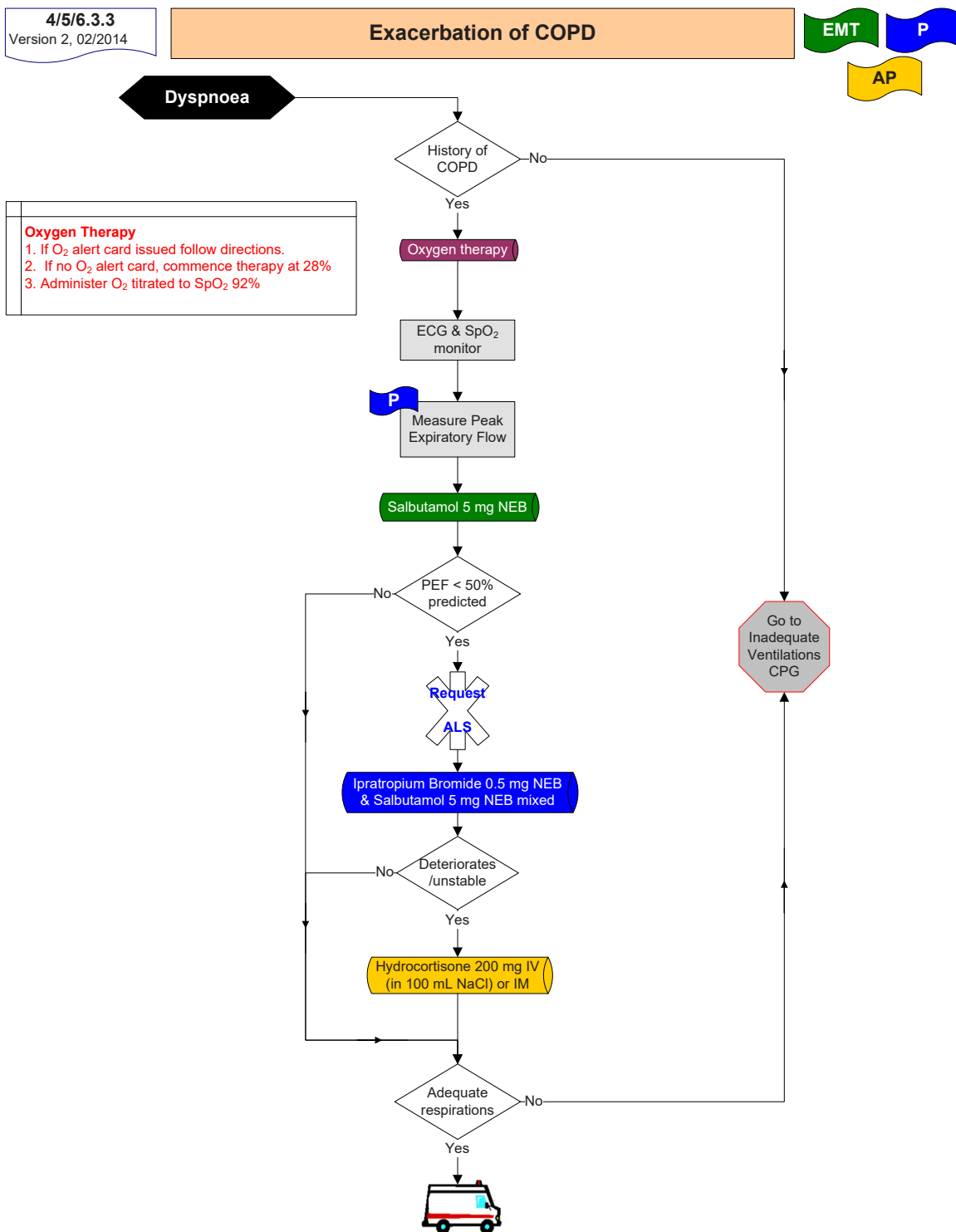


## SECTION 3 – Respiratory Emergencies





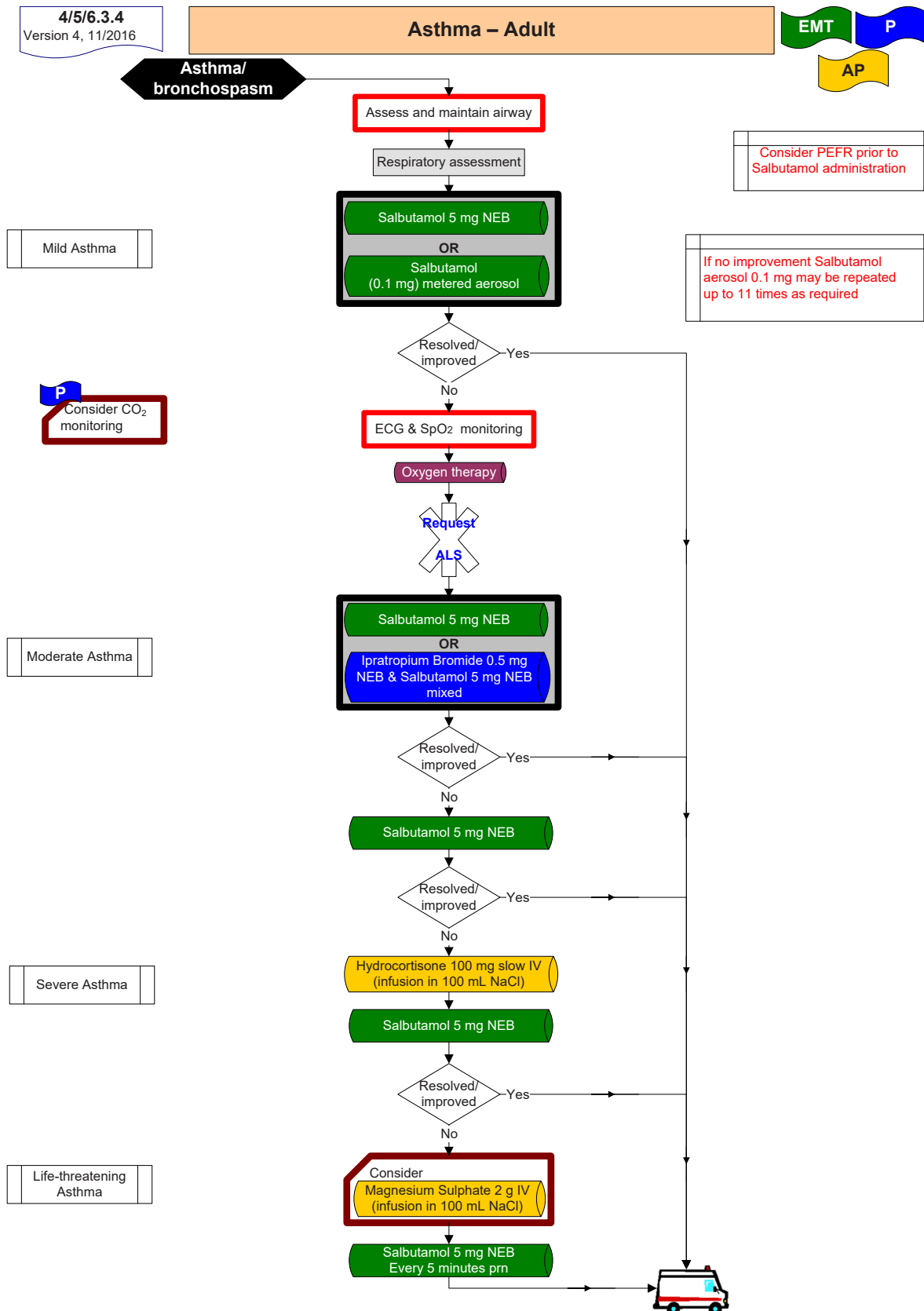
## SECTION 3 – Respiratory Emergencies



**An exacerbation of COPD is defined as;**

An event in the natural course of the disease characterised by a change in the patient's baseline dyspnoea, cough and/or sputum beyond day-to-day variability sufficient to warrant a change in management. (European Respiratory Society)

## SECTION 3 – Respiratory Emergencies



Reference: Management of an Acute Asthma Attack in Adults, Clinical Guideline No. 14, National Clinical Effectiveness Committee, 2015, Emergency Asthma Guidelines, British Thoracic Society, 2008, British Guidelines on the Management of Asthma, a national clinical guideline, ILCOR Guidelines 2015, Asthma Society of Ireland

## SECTION 3 – Respiratory Emergencies

**5/6.3.5**  
Version 1, 12/2013

### Acute Pulmonary Oedema – Adult

P

AP

**Respiratory distress  
with Congestion /  
crepitations**

Oxygen therapy

SpO<sub>2</sub>, ECG & BP  
monitoring

12 Lead ECG

STEMI

Go to  
ACS CPG

Pulmonary  
oedema

No

Go to  
Inadequate  
Respirations  
CPG

Yes

GTN 0.8 mg SL  
Repeat x 1 prn

Reassess

Meets criteria  
for CPAP

No

Yes

Apply Continuous Positive Airway  
Pressure (CPAP) device

Oxygen  
Adequate flow to drive CPAP

Systemic fluid  
retention

Yes

Furosemide 40 mg IV

No

Bradycardia

Yes

Atropine 0.6 mg IV  
Repeat to Max 3 mg prn

No



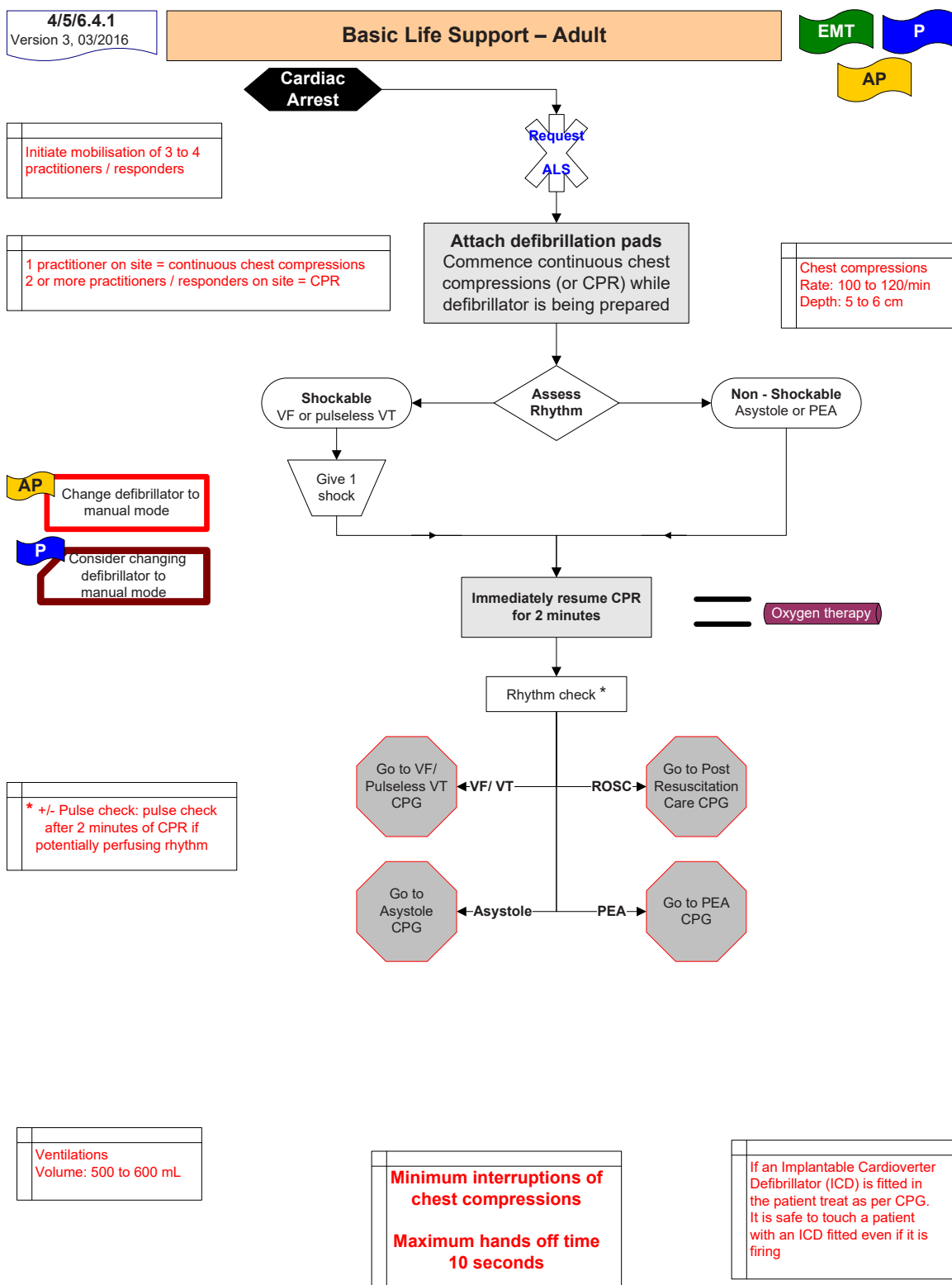
**Criteria for CPAP**  
Clinical signs of APO  
RR > 25 per min  
SpO<sub>2</sub> < 90%

**Exclusion Criteria**  
COPD / Asthma  
Inability to sit up  
Pneumothorax  
Need for immediate intubation  
SBP < 100 mmHg / cardiovascular collapse  
Life-threatening arrhythmia  
Reduced GCS (AVPU < V)  
Unable to tolerate CPAP  
Vomiting

**CPAP**  
Commence with 5 cm H<sub>2</sub>O  
Titrate up to 10 cm H<sub>2</sub>O as tolerated  
Monitor clinical response  
Titrate O<sub>2</sub> to maintain SpO<sub>2</sub> > 95%

Reference: Williams, B et al 2013, When Pressure is Positive: A Literature Review of the Prehospital Use of Continuous Positive Airway Pressure. Prehosp Disaster med, 1-10.

## SECTION 4 - Medical Emergencies



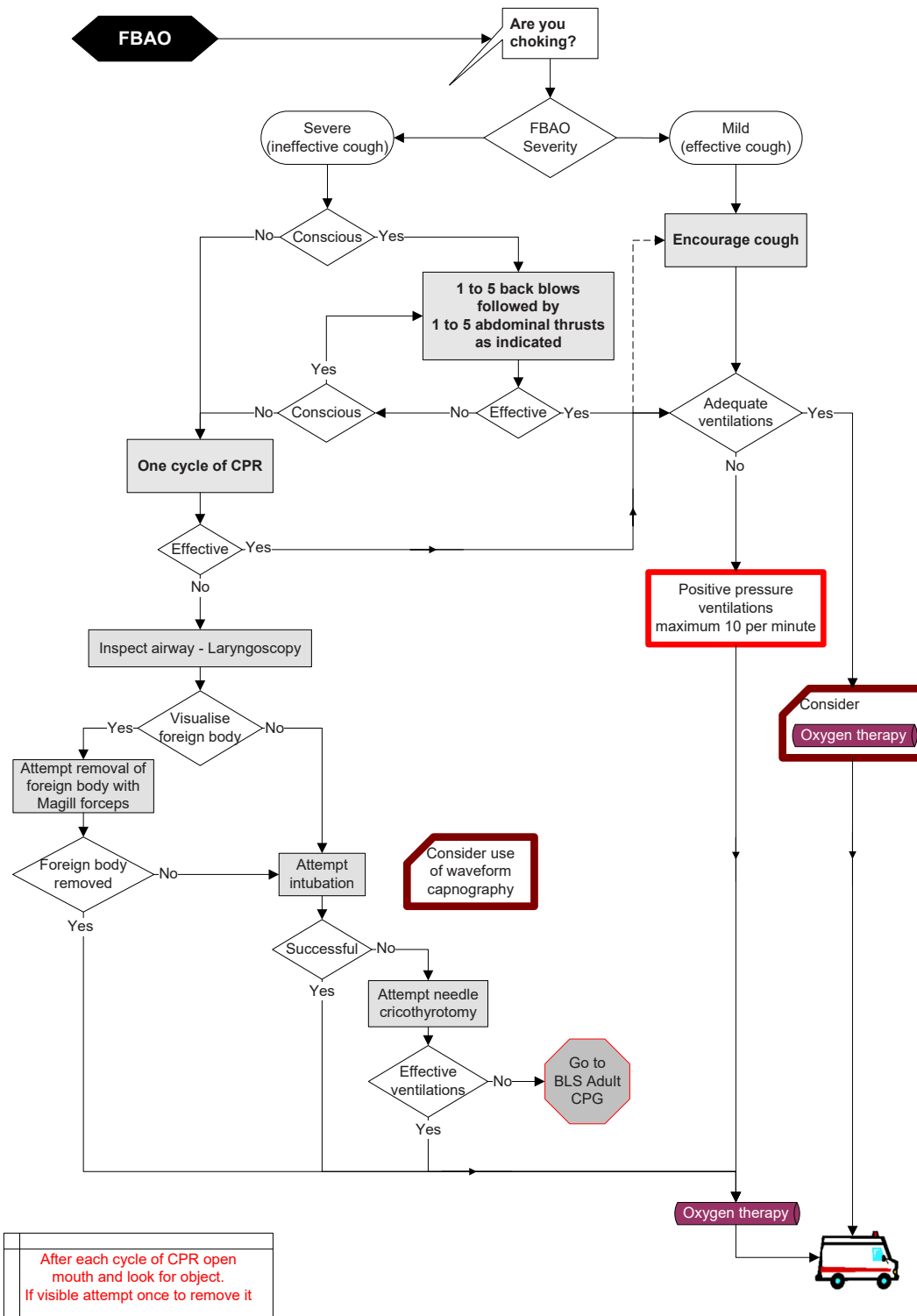
Reference: ILCOR Guidelines 2015

## SECTION 4 - Medical Emergencies

**6.4.2**  
Version 3, 03/2016

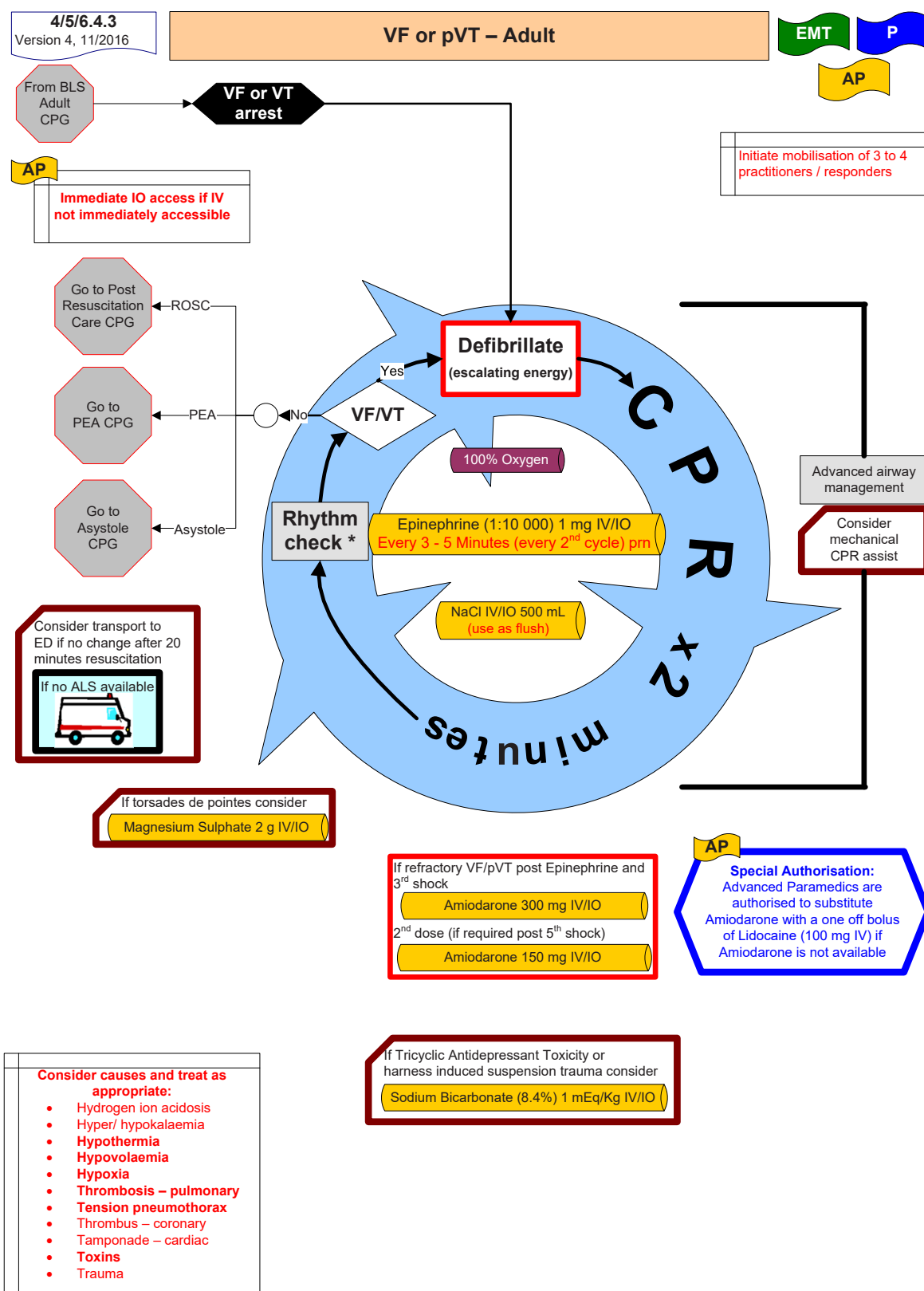
### Foreign Body Airway Obstruction – Adult

AP



Reference: ILCOR Guidelines 2015

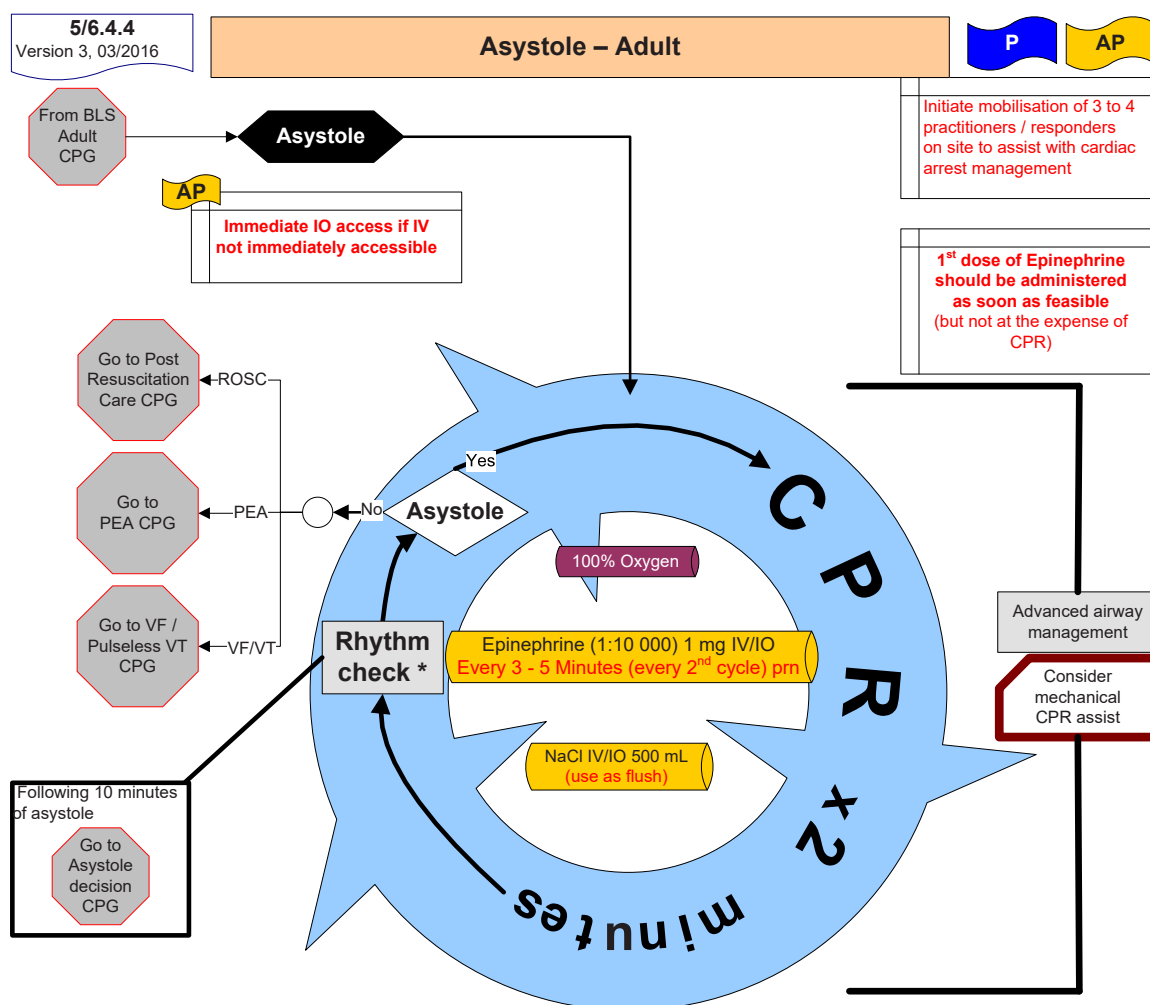
## SECTION 4 - Medical Emergencies



\* +/- Pulse check: pulse check after 2 minutes of CPR if potentially perfusing rhythm

Reference: ILCOR Guidelines 2015

## SECTION 4 – Medical Emergencies



**Consider causes and treat as appropriate:**

- Hydrogen ion acidosis
- Hyper/ hypokalaemia
- Hypothermia
- Hypovolaemia
- Hypoxia
- Thrombosis – pulmonary
- Tension pneumothorax
- Thrombus – coronary
- Tamponade – cardiac
- Toxins
- Trauma

**Consider fluid challenge**

NaCl 1 L IV/IO  
Repeat prn

If Tricyclic Antidepressant Toxicity or harness induced suspension trauma consider

Sodium Bicarbonate (8.4%) 1 mEq/Kg IV/IO

\* +/- Pulse check: pulse check after 2 minutes of CPR if potentially perfusing rhythm

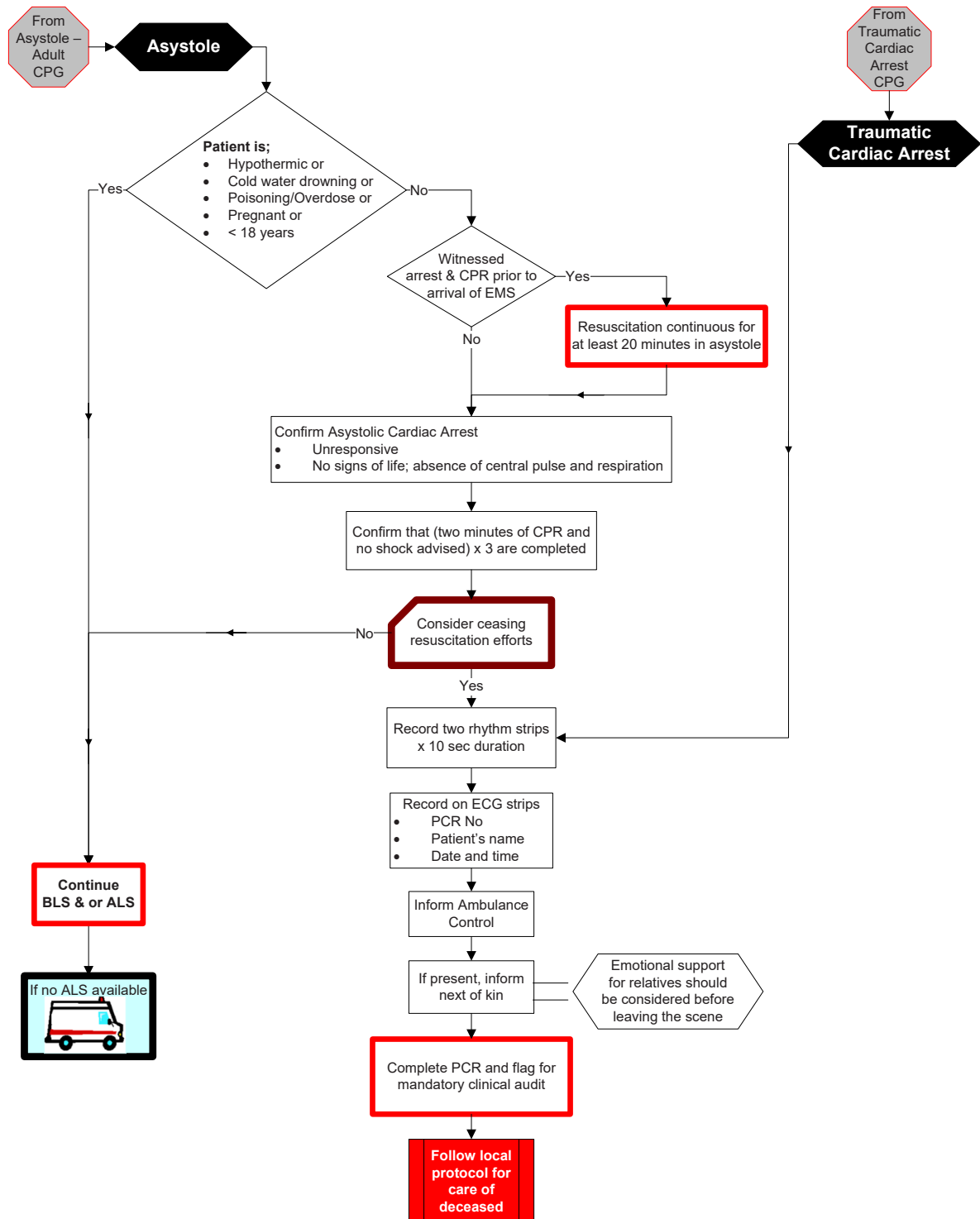
Reference: ILCOR Guidelines 2015

## SECTION 4 - Medical Emergencies

5/6.4.5  
Version 1, 05/2008

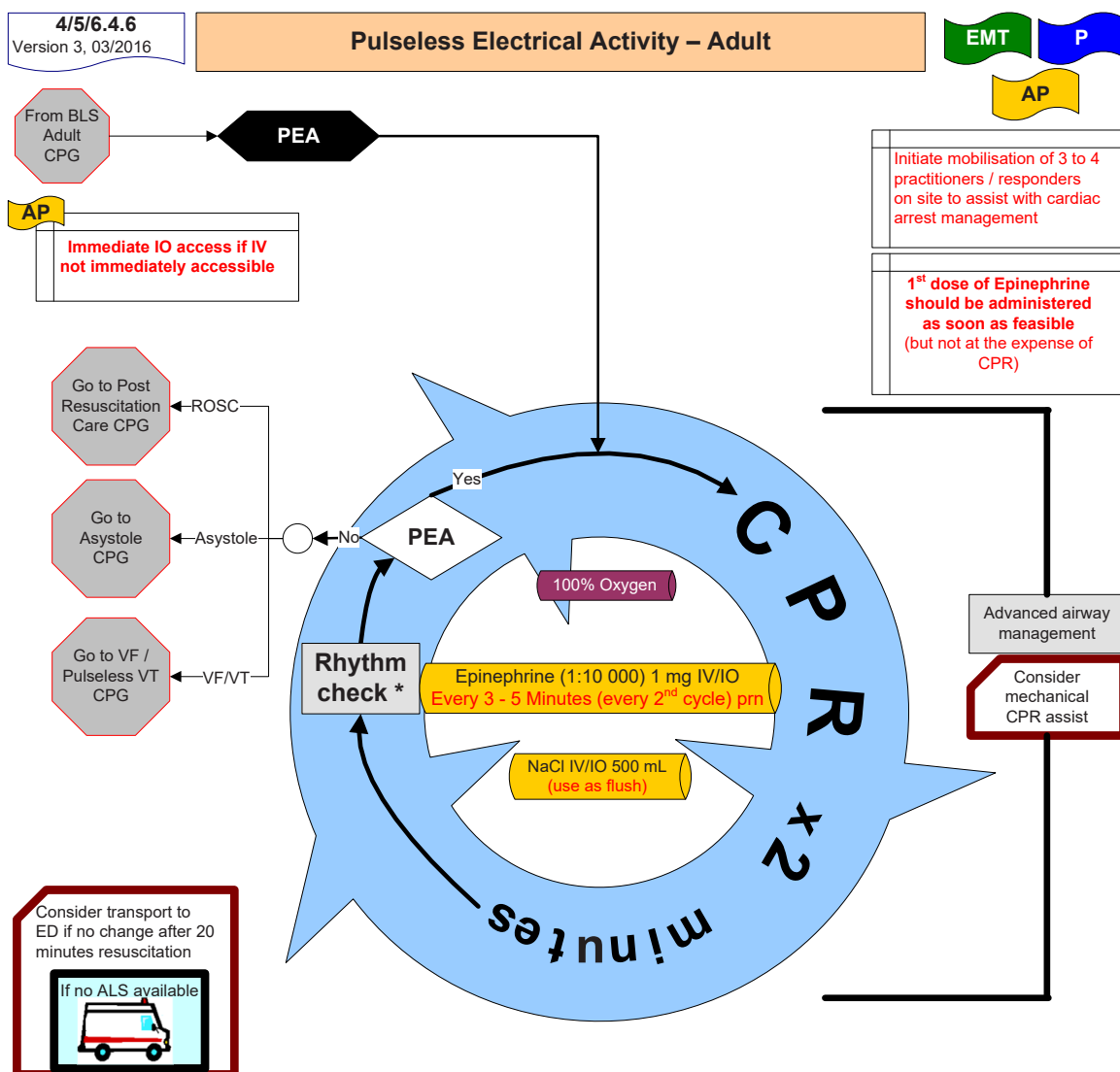
### Asystole - Decision Tree

P AP





## SECTION 4 - Medical Emergencies



**Consider causes and treat as appropriate:**

- Hydrogen ion acidosis
- Hyper/ hypokalaemia
- Hypothermia
- Hypovolaemia
- Hypoxia
- Thrombosis – pulmonary
- Tension pneumothorax
- Thrombus – coronary
- Tamponade – cardiac
- Toxins
- Trauma

**Consider fluid challenge**

NaCl 1 L IV/IO  
Repeat prn

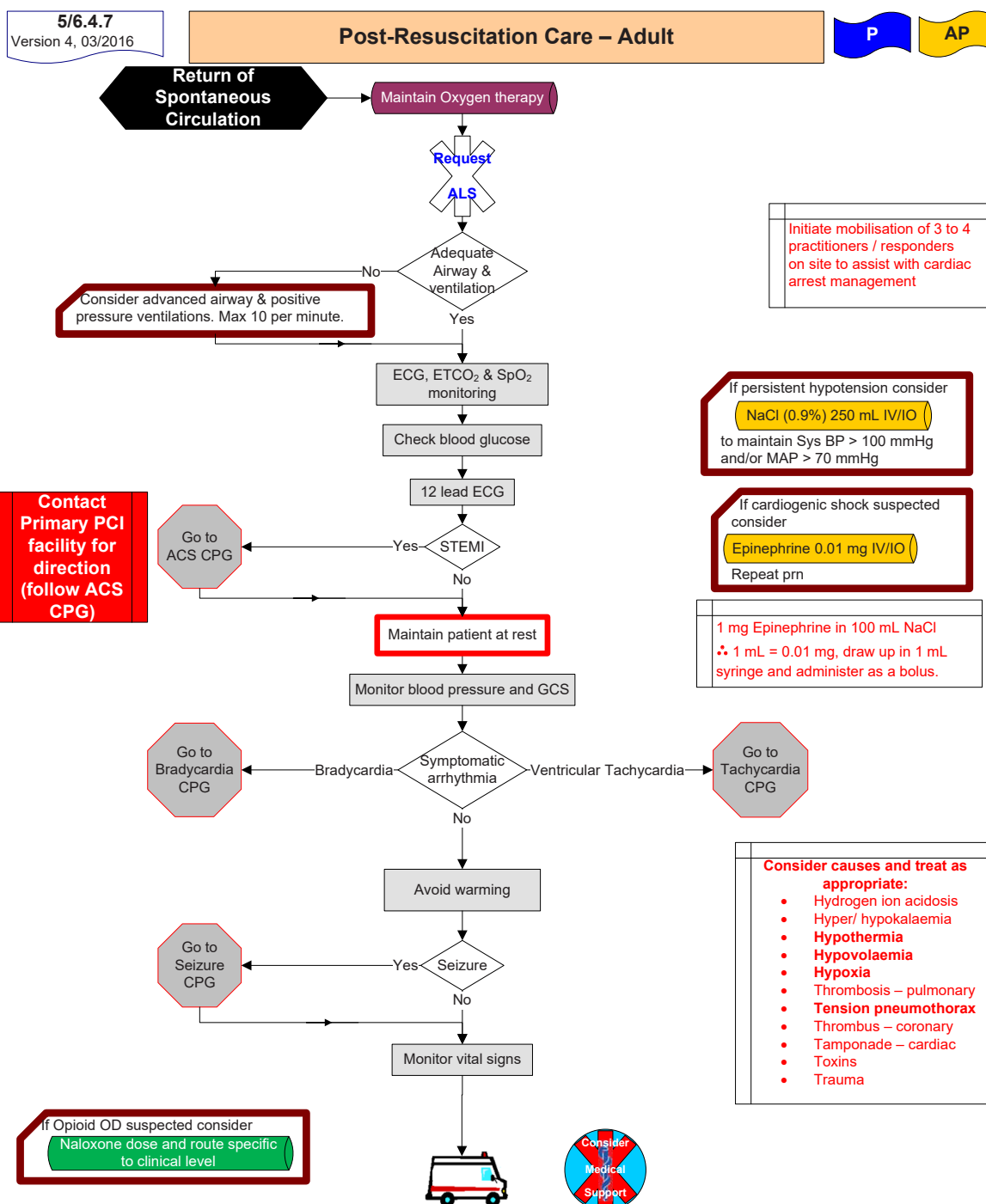
If Tricyclic Antidepressant Toxicity or harness induced suspension trauma consider

Sodium Bicarbonate (8.4%) 1 mEq/Kg IV/IO

\* +/- Pulse check: pulse check after 2 minutes of CPR if potentially perfusing rhythm

Reference: ILCOR Guidelines 2015

## SECTION 4 – Medical Emergencies



Reference: ILCOR Guidelines 2015

Noc, M., et al. (2014). "Invasive coronary treatment strategies for out-of-hospital cardiac arrest: a consensus statement from the European association for percutaneous cardiovascular interventions (EAPCI)/stent for life (SFL) groups." *EuroIntervention* 10(1): 31-37

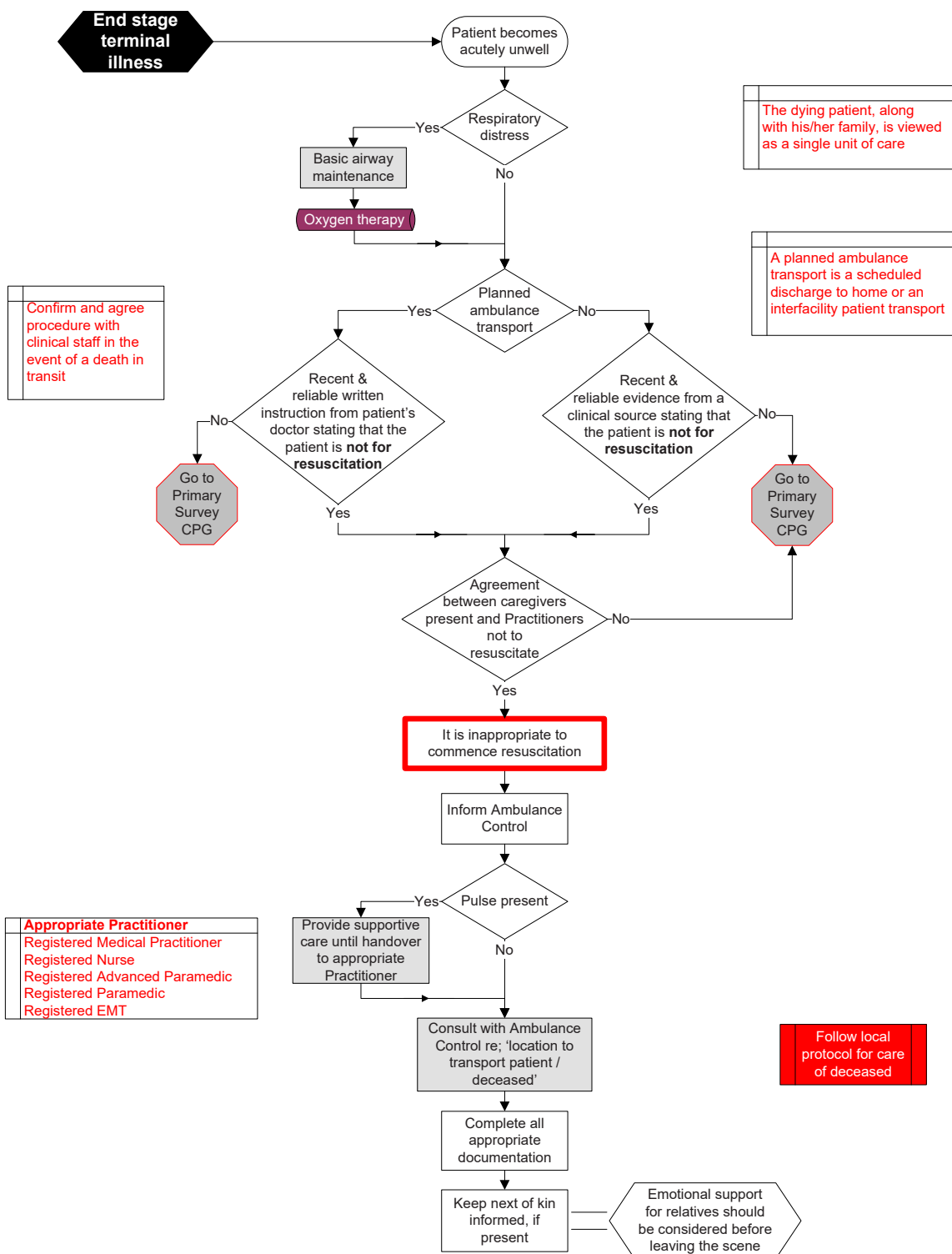
## SECTION 4 – Medical Emergencies

5/6.4.8  
Version 1, 06/2010

### End of Life – DNR

P

AP



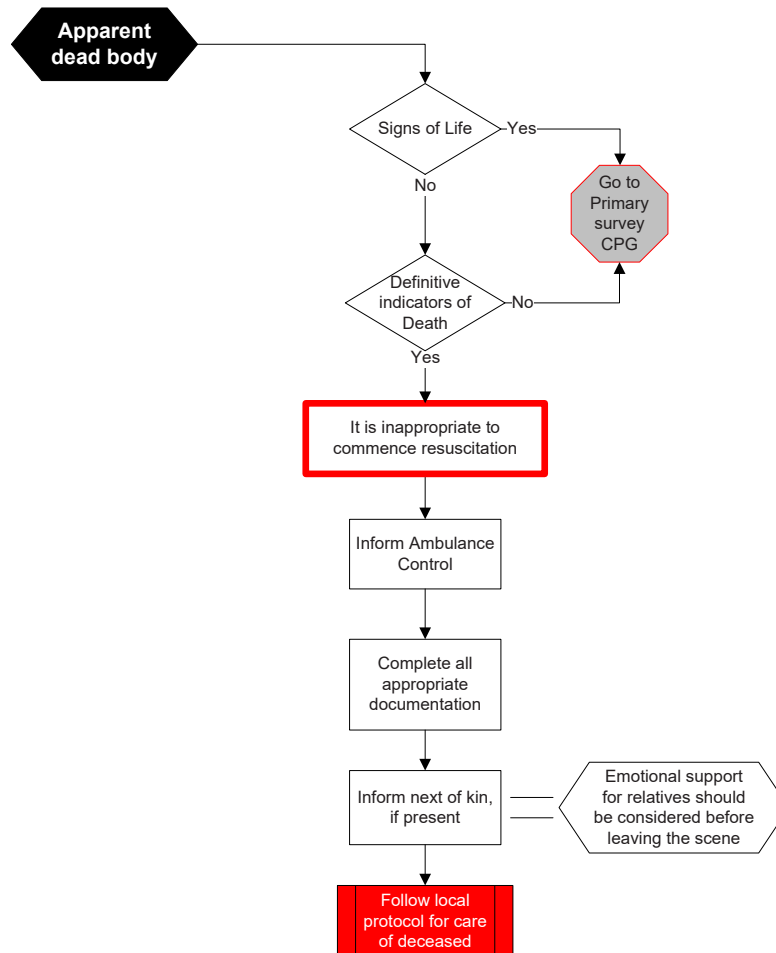
## SECTION 4 – Medical Emergencies

**5/6.4.9**  
Version 2, 06/2011

### Recognition of Death – Resuscitation not Indicated

P

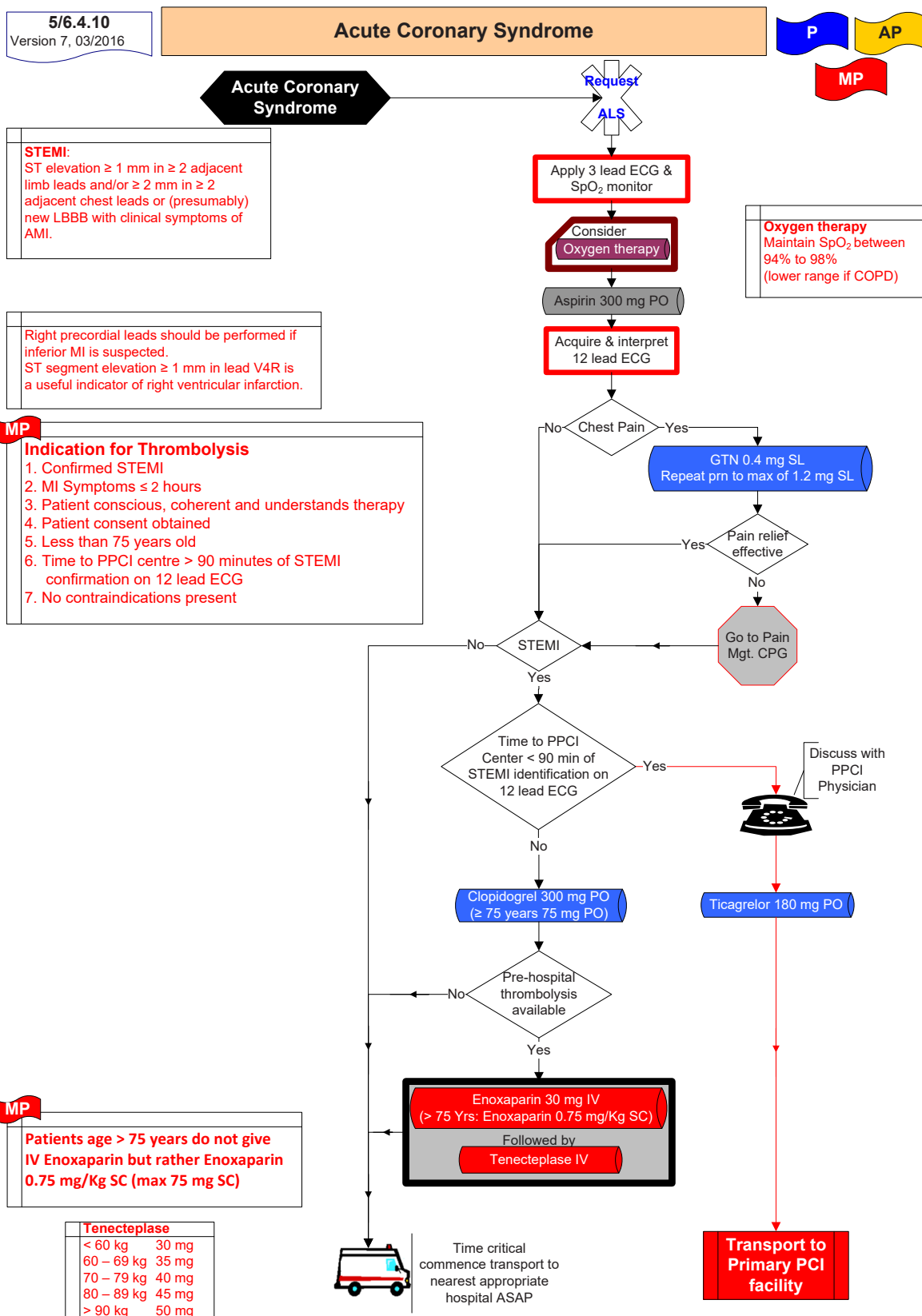
AP



#### Definitive indicators of death:

1. Decomposition
2. Obvious rigor mortis
3. Obvious pooling (hypostasis)
4. Incineration
5. Decapitation
6. Injuries totally incompatible with life
7. Unwitnessed traumatic cardiac arrest following blunt trauma (see CPG 5/6.6.11)

## SECTION 4 - Medical Emergencies

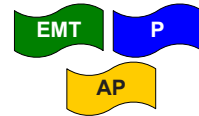


Reference: HSE ACS Programme 2013, ILCOR Guidelines 2015, ECS Guidelines 2010

## SECTION 4 – Medical Emergencies

4/5/6.4.11  
Version 3, 03/2016

### Symptomatic Bradycardia – Adult



**Symptomatic includes;**  
Acute altered mental status  
Ischemic chest discomfort  
Acute heart failure  
Hypotension  
Signs of shock

**Symptomatic Bradycardia**

Oxygen therapy

Request  
ALS

ECG & SpO<sub>2</sub> monitoring

P

12 lead ECG

Titrate Atropine to effect (HR > 60) and non symptomatic

Atropine 0.6 mg IV  
Repeat at 3 to 5 min intervals prn to max 3 mg

NaCl (0.9%) 250 mL IV infusion  
(Repeat x one prn)

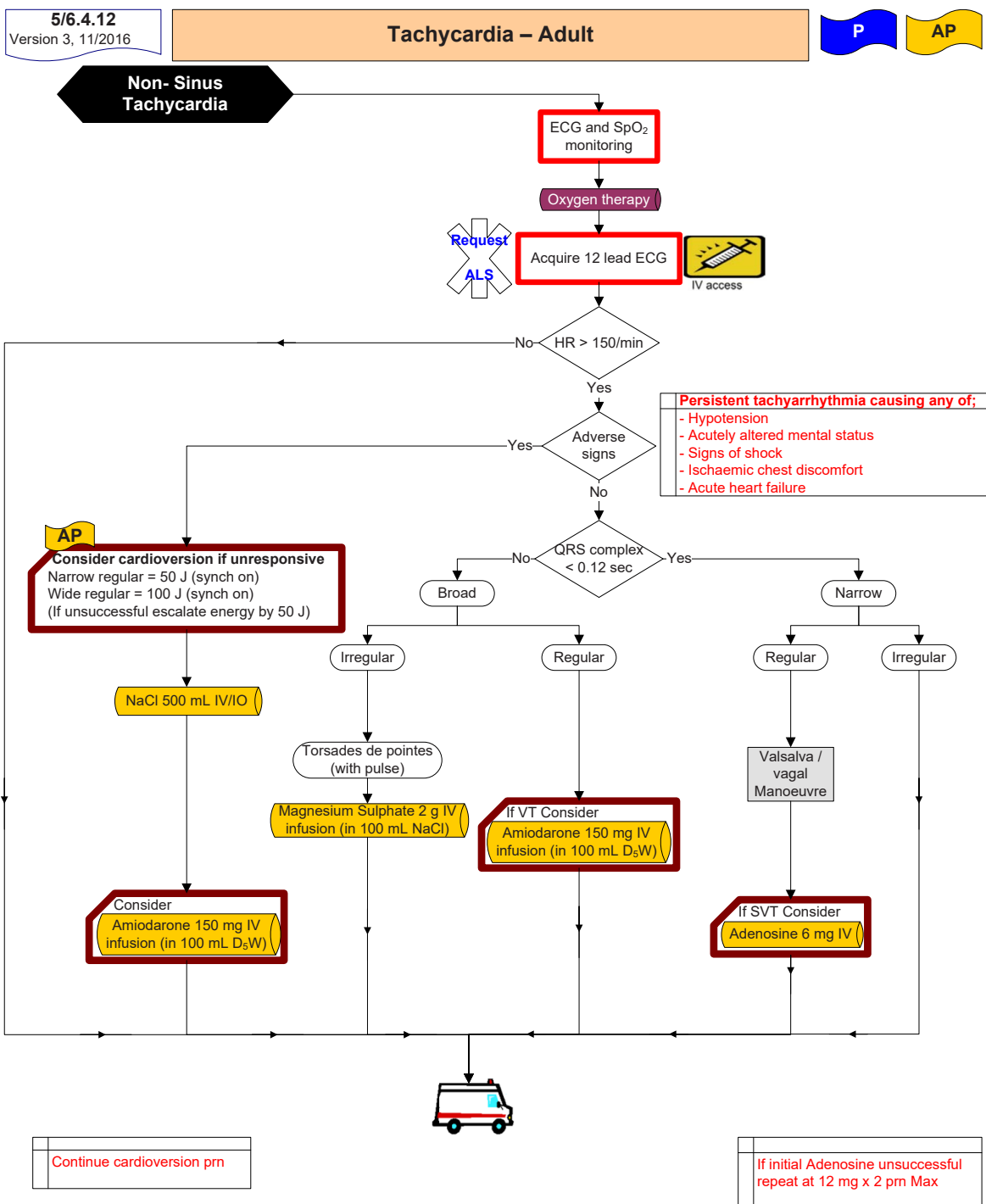
If cardiogenic shock suspected consider  
Epinephrine 0.01 mg IV/IO  
Repeat prn

1 mg Epinephrine in 100 mL NaCl  
♣ 1 mL = 0.01 mg, draw up in 1 mL syringe and administer as a bolus.

Reassess



## SECTION 4 - Medical Emergencies



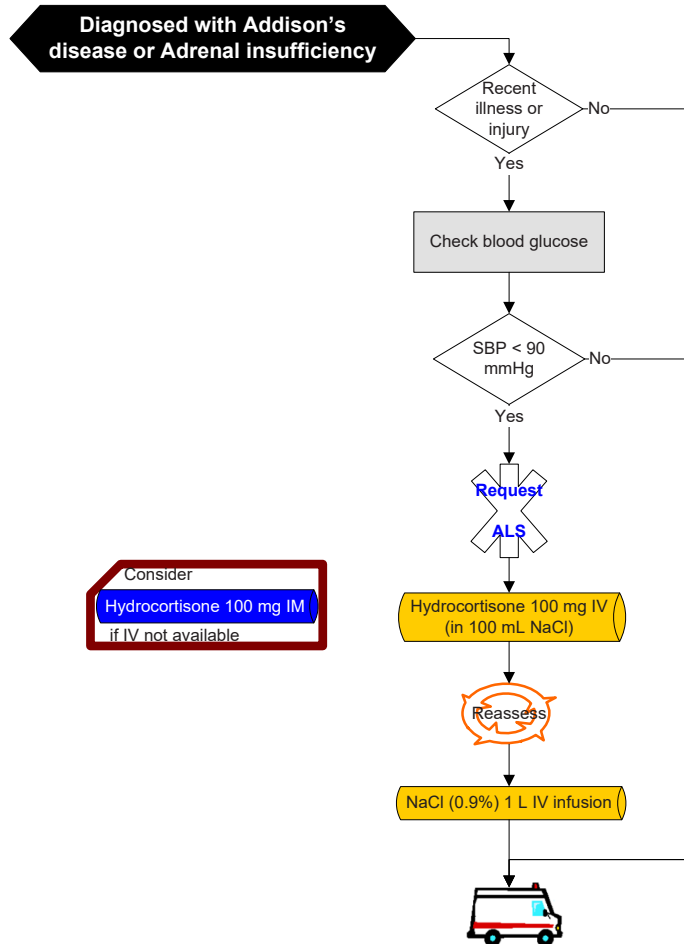
## SECTION 4 – Medical Emergencies

**5/6.4.13**  
Version 1, 12/2013

### Adrenal Insufficiency – Adult

P

AP



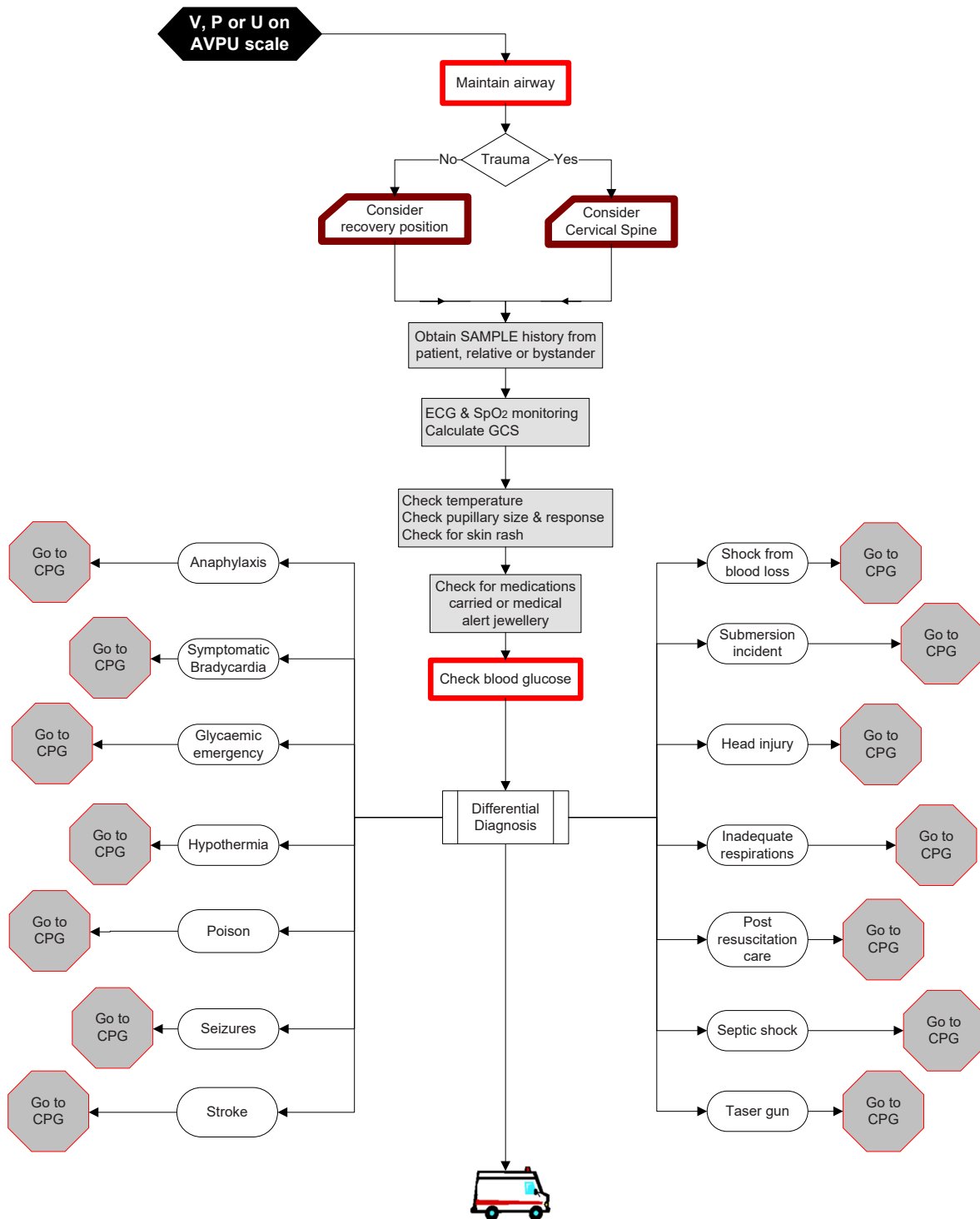
Reference: Wiebke Arit, Emergency management of acute adrenal insufficiency (adrenal crisis) in adult patients, Endocrine Connections 2016, Sep; 5 (5): G1 – G3



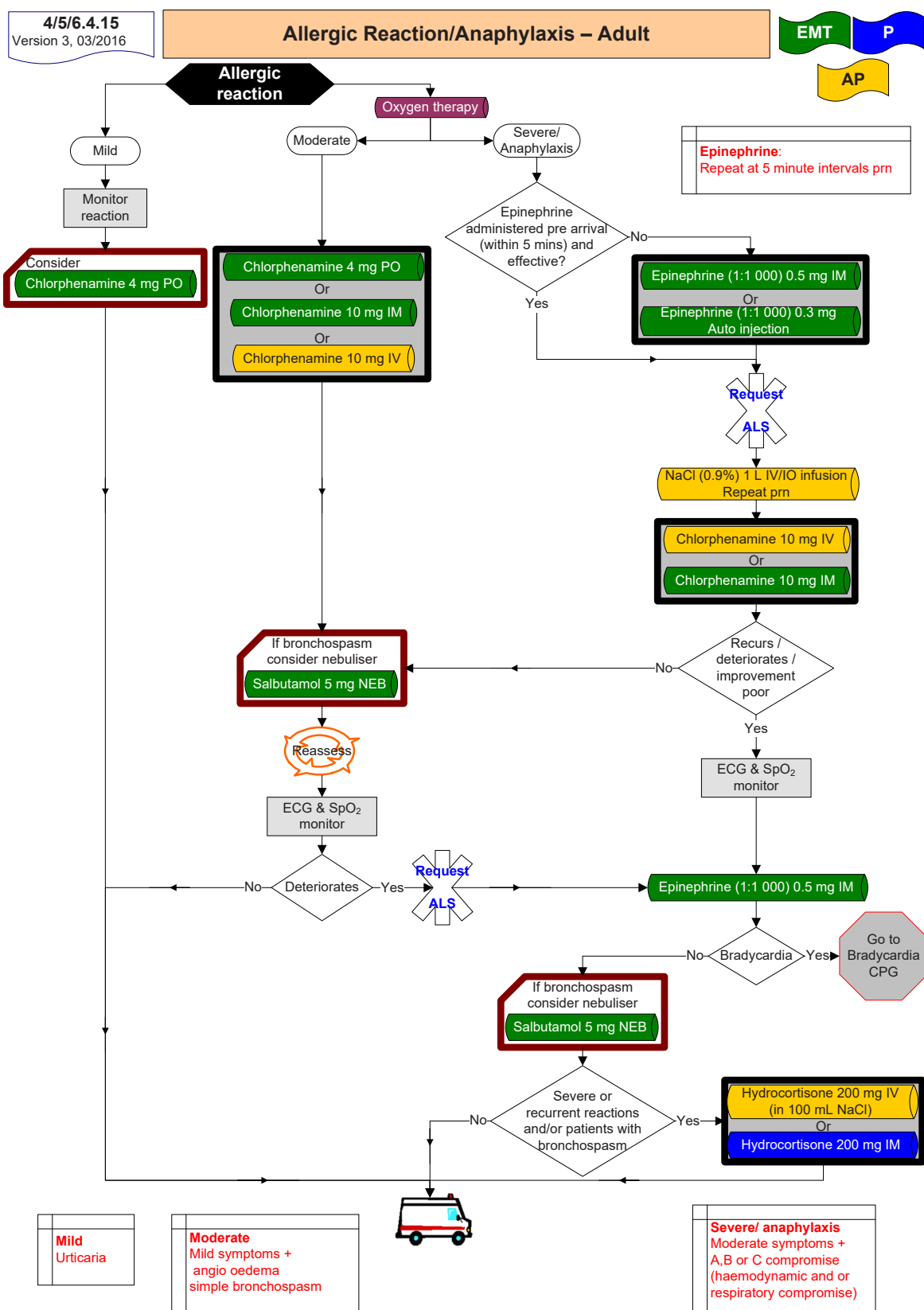
## SECTION 4 - Medical Emergencies

5/6.4.14  
Version 1, 05/2008

### Altered Level of Consciousness – Adult

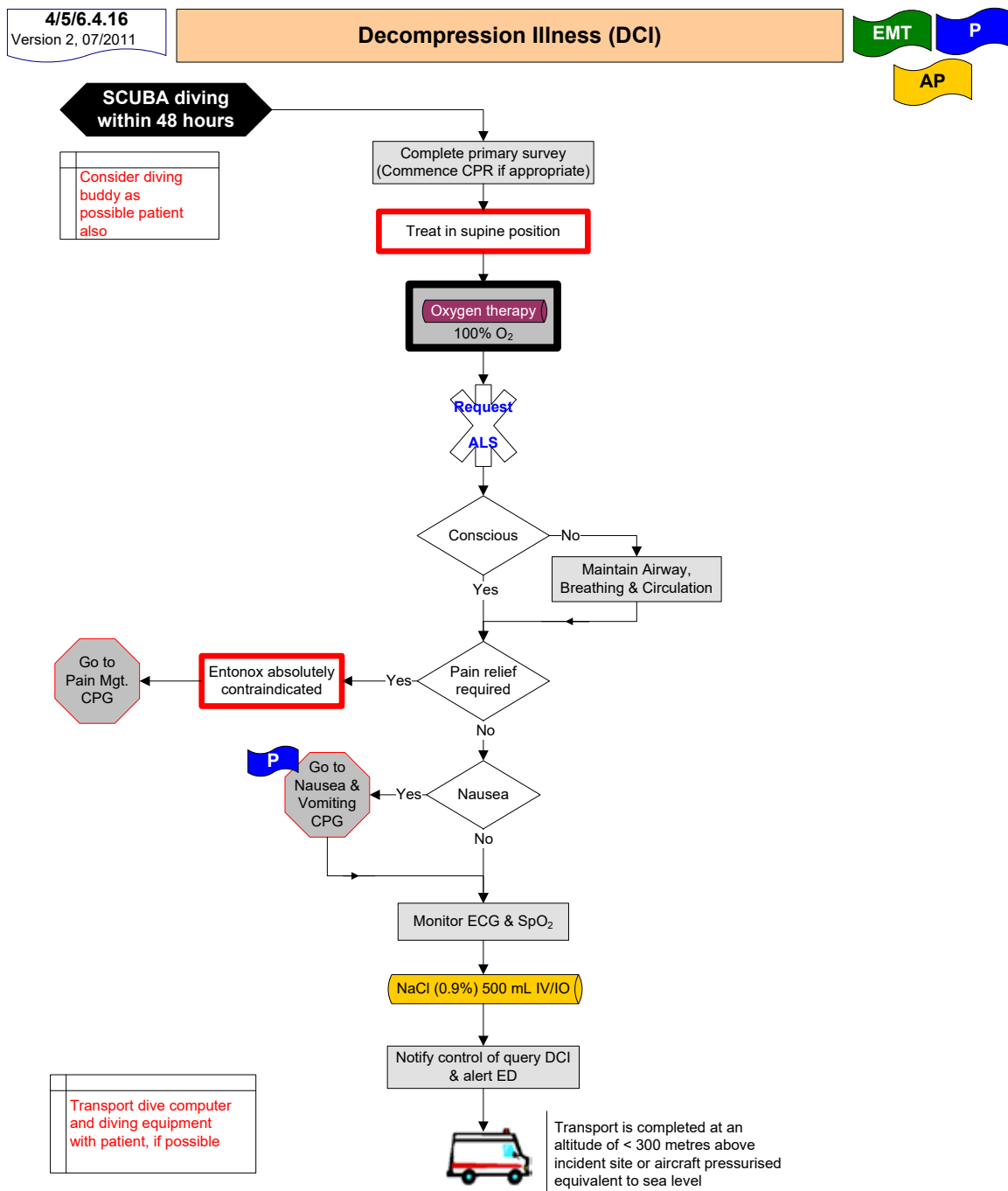


## SECTION 4 - Medical Emergencies



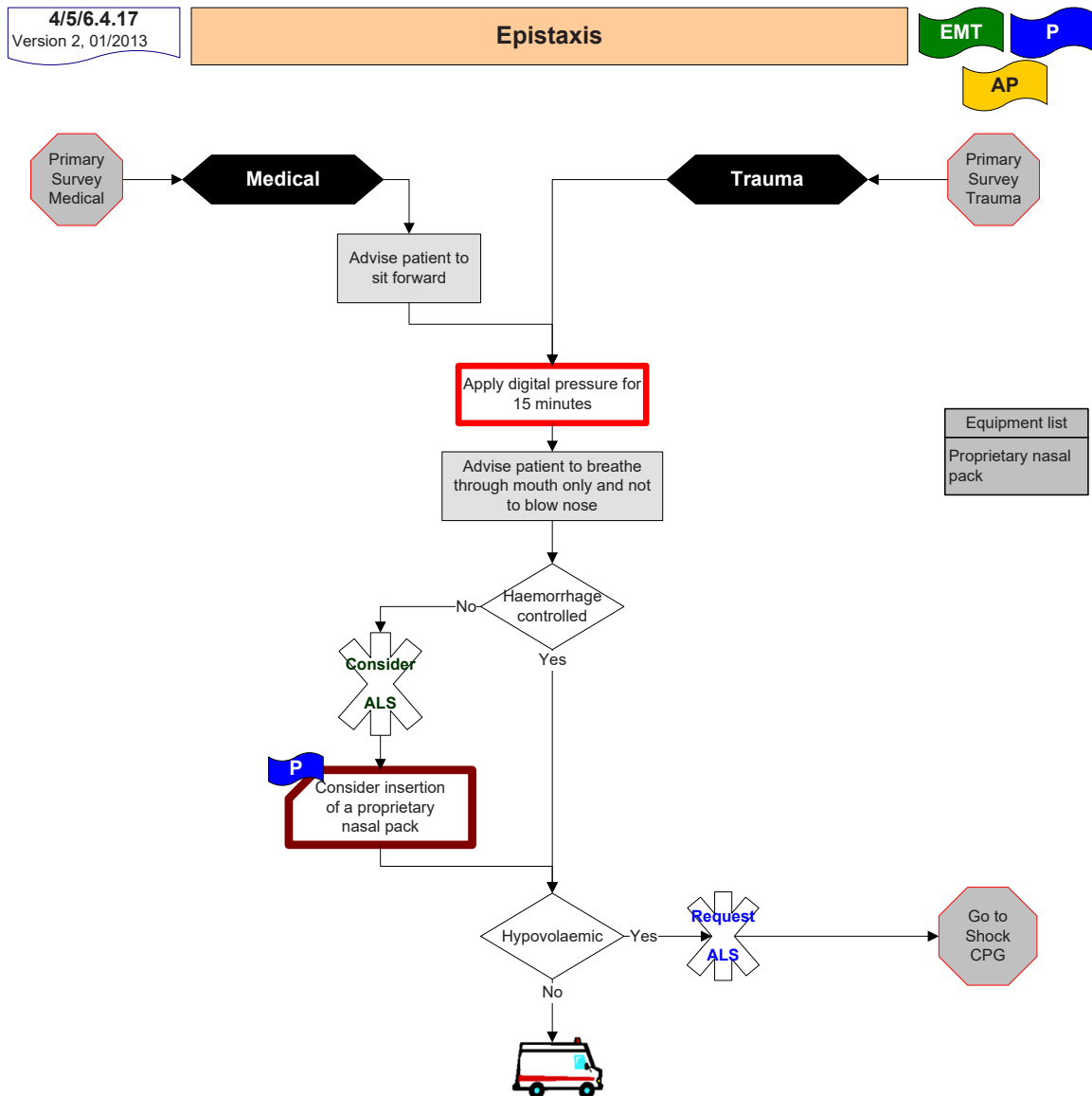
Reference: Royal College of Physicians of Ireland, 2014, National Immunisation Advisory Committee, Anaphylactic Reactions: Treatment Algorithm for First Medical Responders.

## SECTION 4 - Medical Emergencies



Reference: The Primary Clinical Care Manual 3<sup>rd</sup> Edition, 2003, Queensland Health and the Royal Flying Doctor Service (Queensland Section)

## SECTION 4 - Medical Emergencies

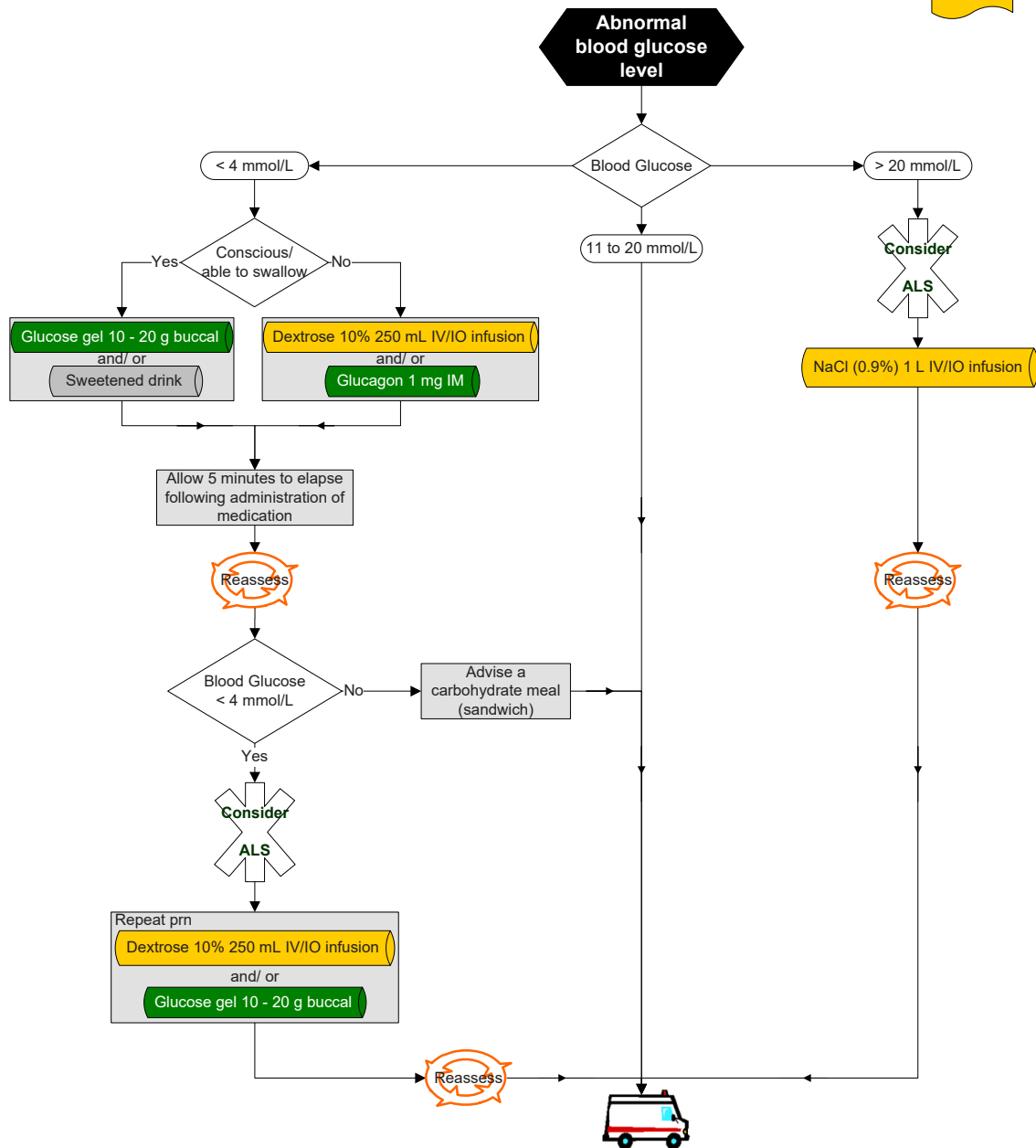
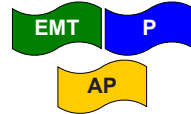


Reference: Management of Acute Epistaxis 2011, Ola Bamimore, MD; Chief Editor: Steven C Dronen, MD, <http://emedicine.medscape.com/article/764719-overview#showall>

## SECTION 4 - Medical Emergencies

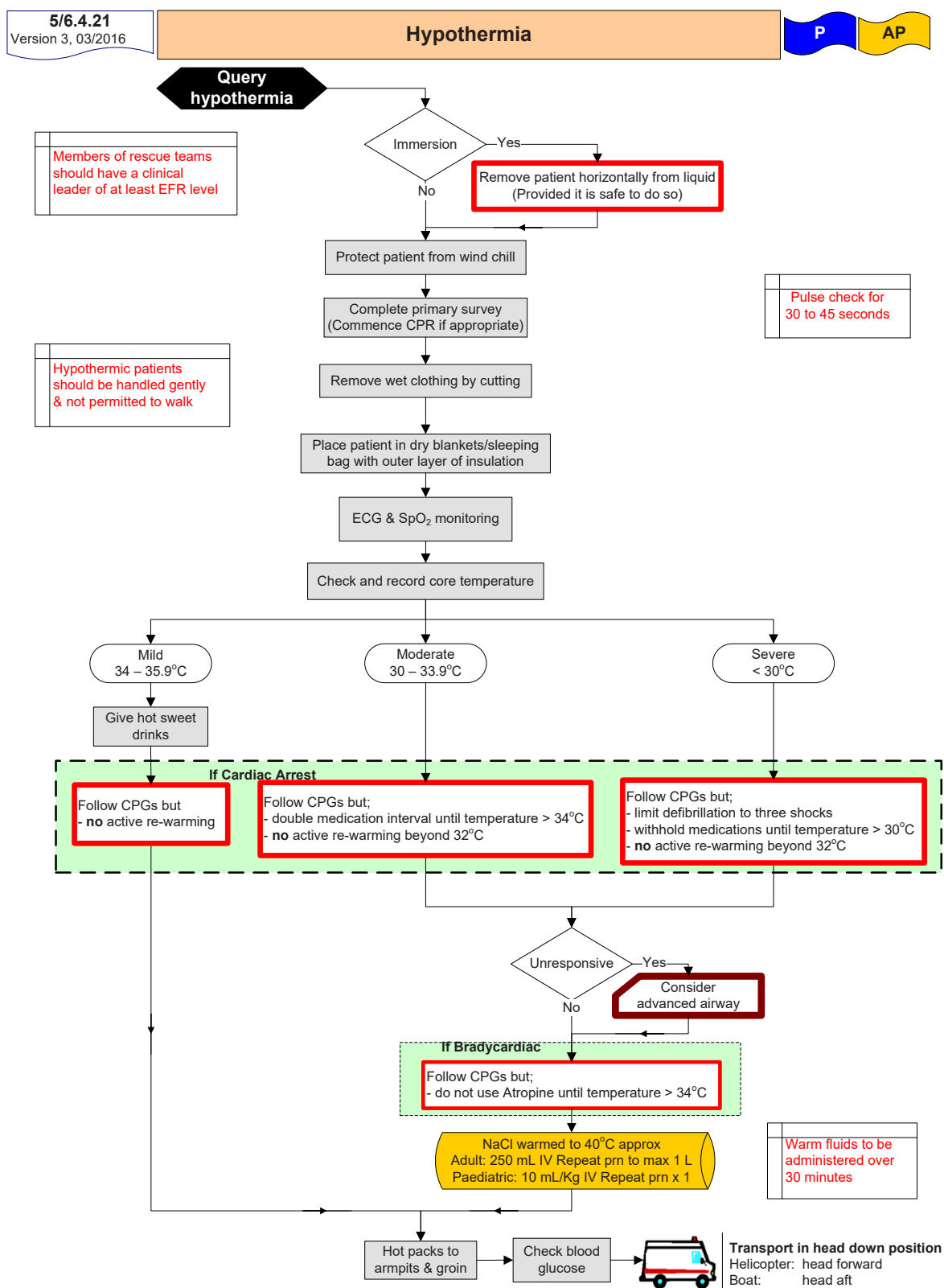
4/5/6.4.19  
Version 2, 04/2016

### Glycaemic Emergency – Adult



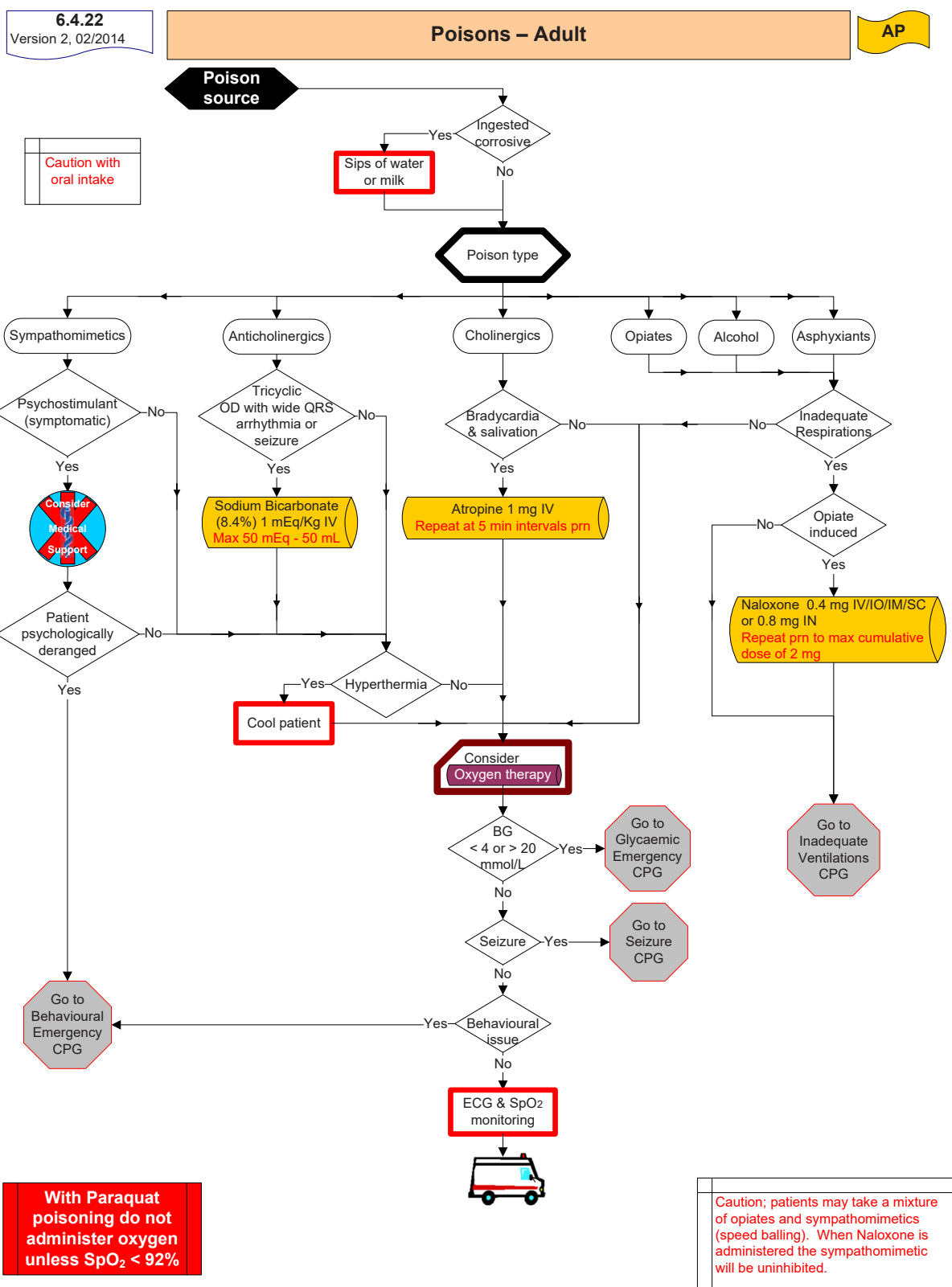
Reference:  
Moore, C. and M. Woollard (2005). "Dextrose 10% or 50% in the treatment of hypoglycaemia out of hospital? A randomised controlled trial." *Emerg Med J* 22(7): 512-515  
Carstens, S. and M. Sprehn (1998). "Prehospital treatment of severe hypoglycaemia: a comparison of intramuscular glucagon and intravenous glucose." *Prehosp Disaster Med* 13(2-4): 44-50

## SECTION 4 - Medical Emergencies



Reference: Golden, F & Tipton M, 2002, Essentials of Sea Survival, Human Kinetics  
European Resuscitation Council Guidelines for Resuscitation 2015  
Pennington M, et al, 1994, Wilderness EMT, Wilderness EMS Institute

## SECTION 4 - Medical Emergencies



Reference: Body, R, Guidelines in Emergency Medicine Network (GEMNet): guideline for the management of tricyclic antidepressant overdose, Emerg Med J 2011;28: 347e368.  
Boyer, E, 2012, Management of Opioid Analgesic Overdose, N Engl J Med 2012;367:146-55.DOI: 10.1056/NEJMr1202561  
National Drugs Strategy, 2006, Management of Patients with Psychostimulant Toxicity, Guidelines for ambulance service, Commonwealth of Australia.

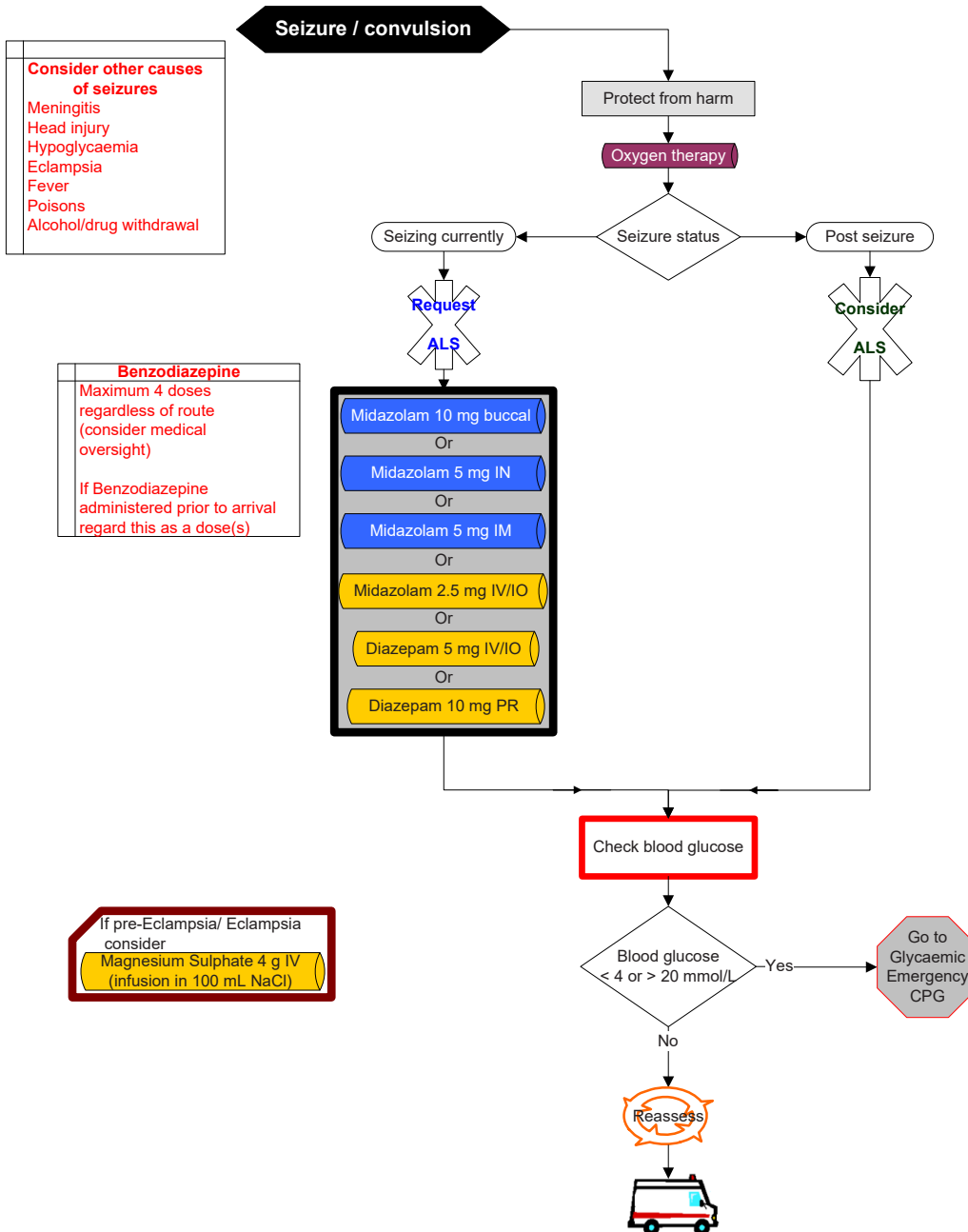
## SECTION 4 – Medical Emergencies

5/6.4.23  
Version 5, 11/2016

### Seizure/Convulsion – Adult

P

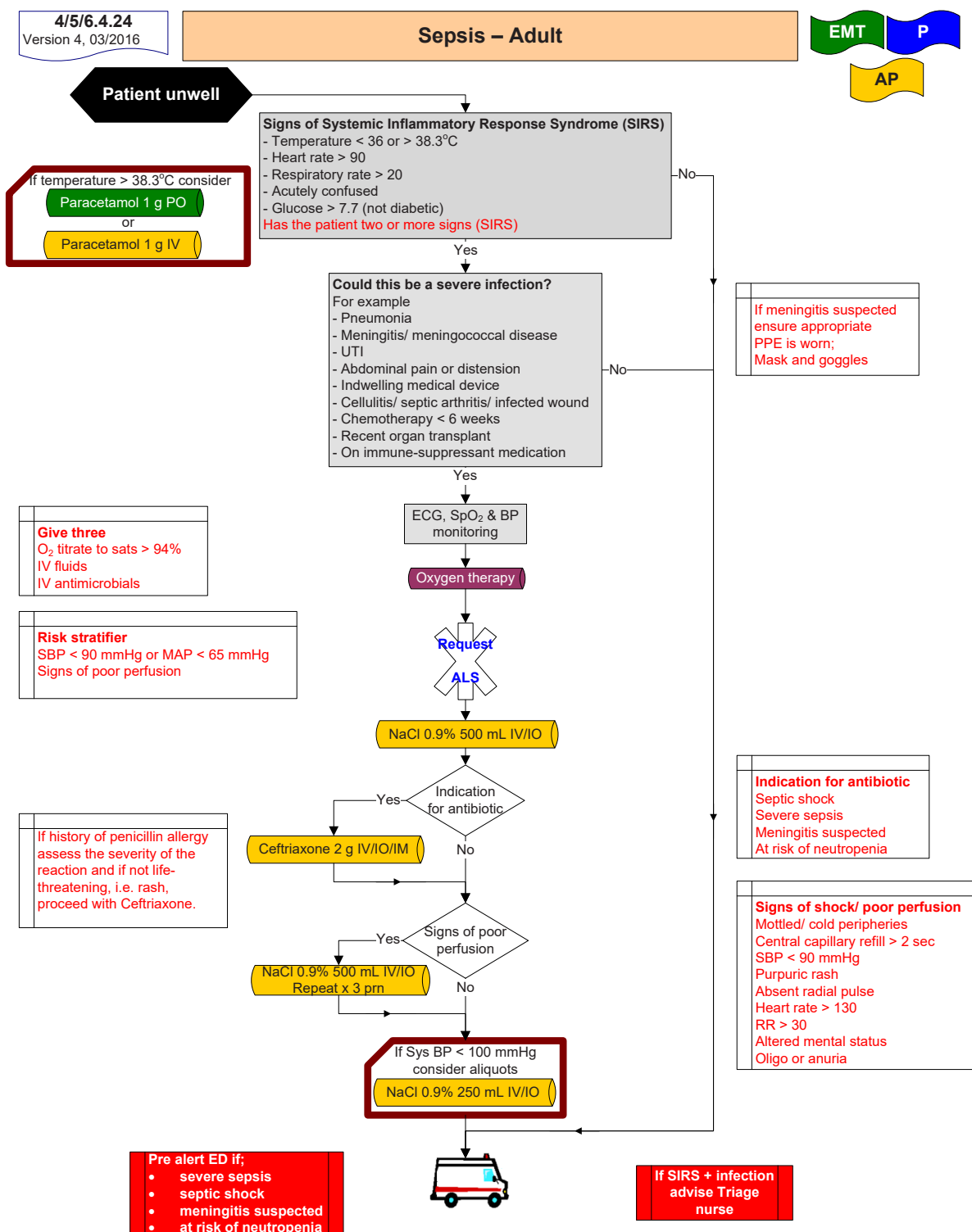
AP



Reference: Tukur, J. and Z. Muhammad (2010). "Management of eclampsia at AKTH: before and after magnesium sulphate." *Niger J Med* 19(1): 104-107



## SECTION 4 – Medical Emergencies



Reference: National Clinical Guideline No. 6: Sepsis Management, National Clinical Effectiveness Committee, Department of Health, November, 2014

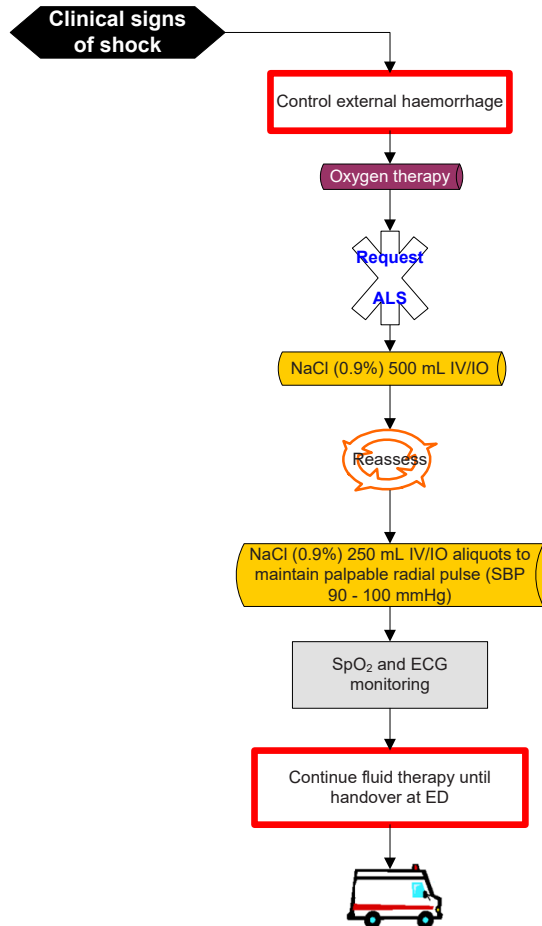
## SECTION 4 - Medical Emergencies

5/6.4.25  
Version 1, 12/2013

### Shock from Blood Loss (non-trauma) – Adult

P

AP



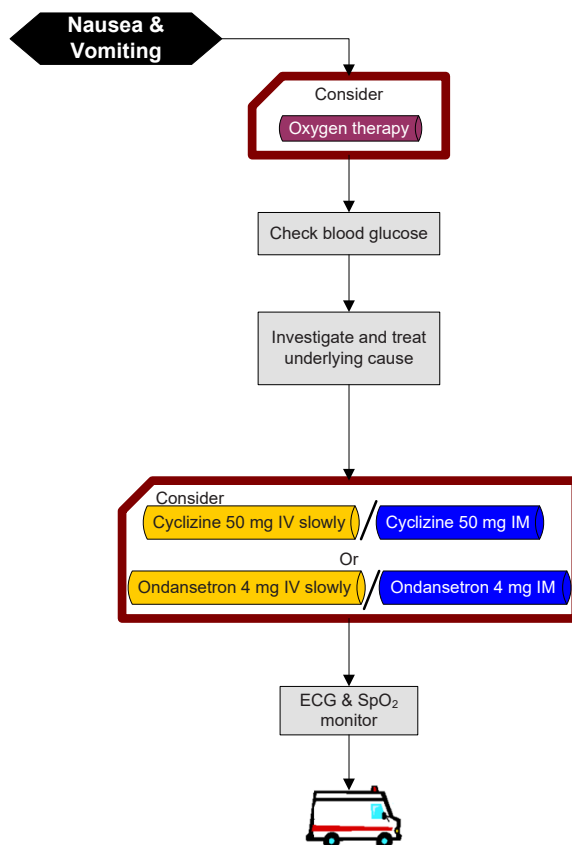
## SECTION 4 – Medical Emergencies

5/6.4.26  
Version 2, 04/2016

### Significant Nausea & Vomiting – Adult

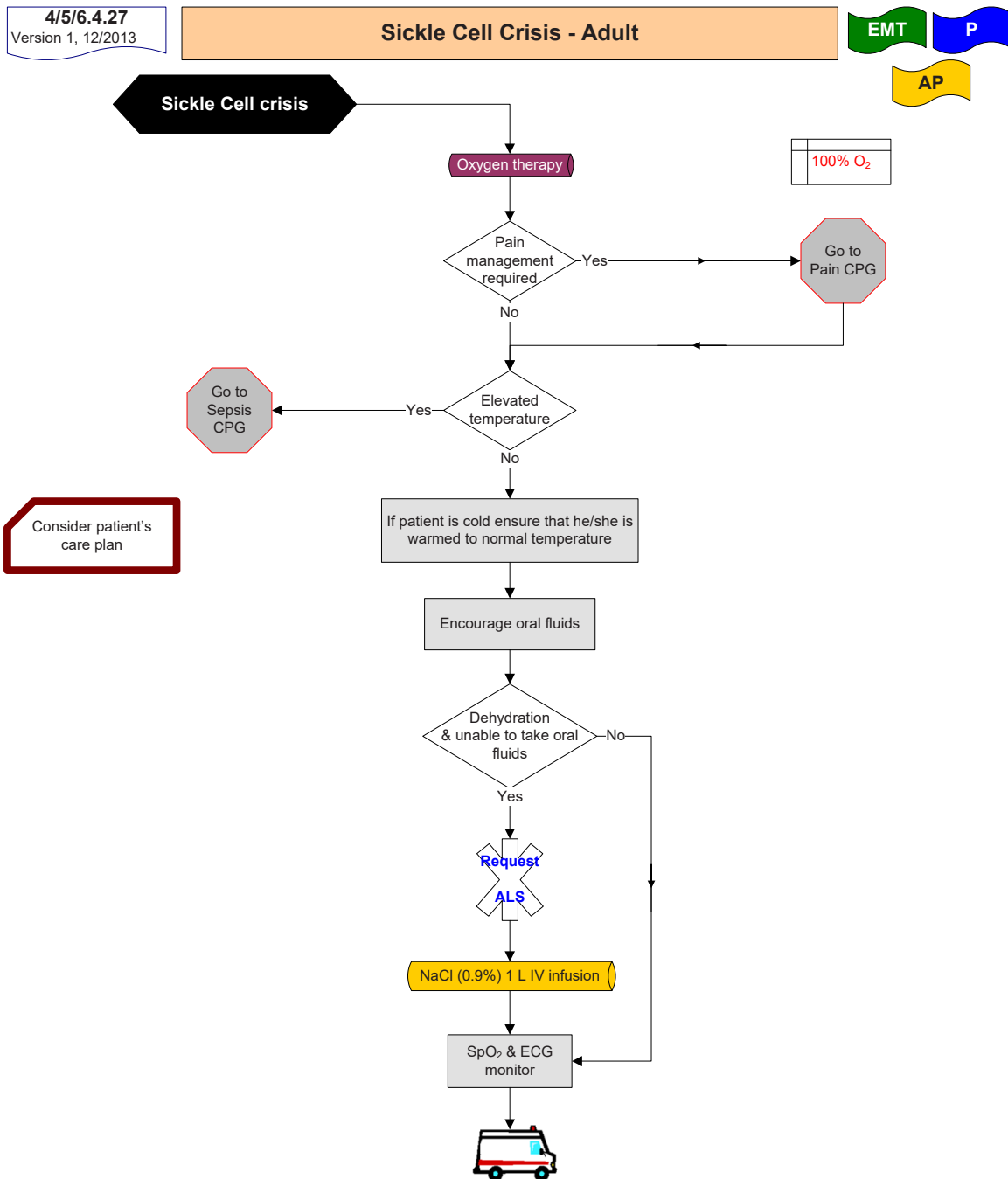
P

AP



Reference: Salvucci, A. A., et al. (2011). "Ondansetron is safe and effective for prehospital treatment of nausea and vomiting by paramedics." *Prehosp Emerg Care* 15(1): 34-38

## SECTION 4 - Medical Emergencies

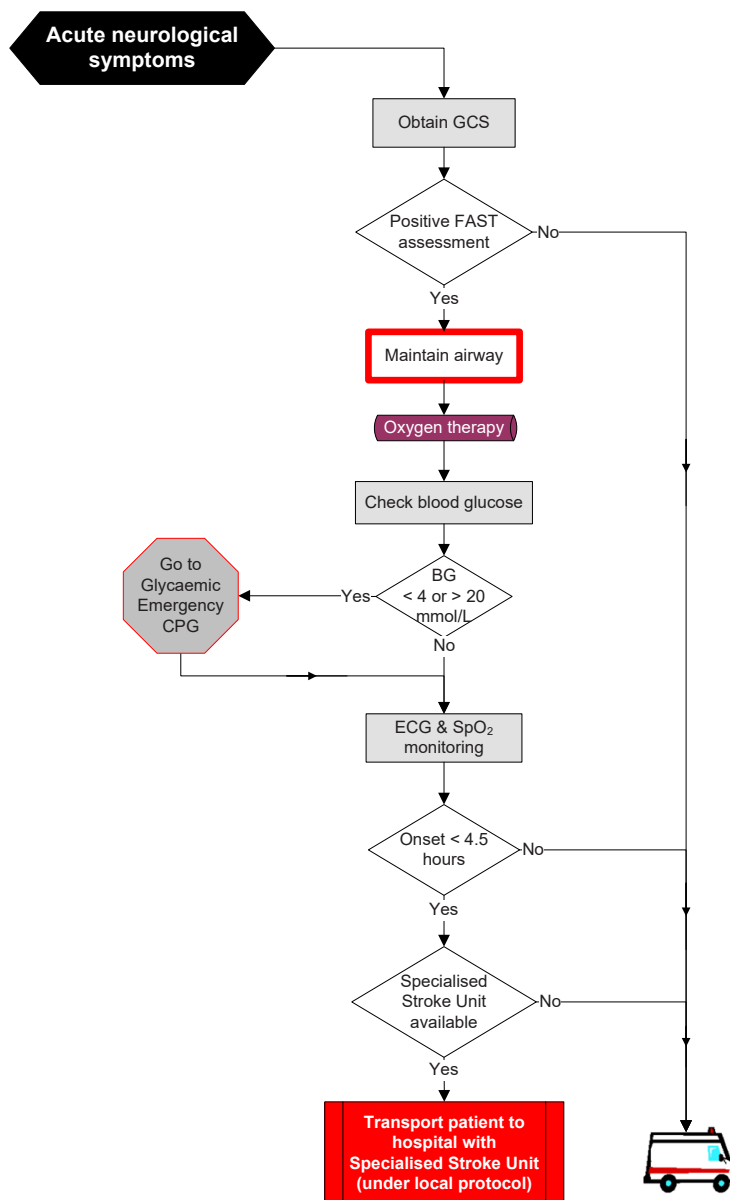


Reference: Rees, D, 2003, GUIDELINES FOR THE MANAGEMENT OF THE ACUTE PAINFUL CRISIS IN SICKLE CELL DISEASE; British Journal of Haematology, 2003, 120, 744–752

## SECTION 4 – Medical Emergencies

5/6.4.28  
Version 3, 03/2016

### Stroke



#### F – facial weakness

Can the patient smile? Has their mouth or eye drooped? Which side?

#### A – arm weakness

Can the patient raise both arms and maintain for 5 seconds?

#### S – speech problems

Can the patient speak clearly and understand what you say?

#### T – time of onset

#### Reference

ILCOR Guidelines 2015

Prof R Boyle, 2006, Mending hearts and brains, Clinical case for change: Report by Prof R Boyle, National Director for Heart Disease and Stroke, NHS

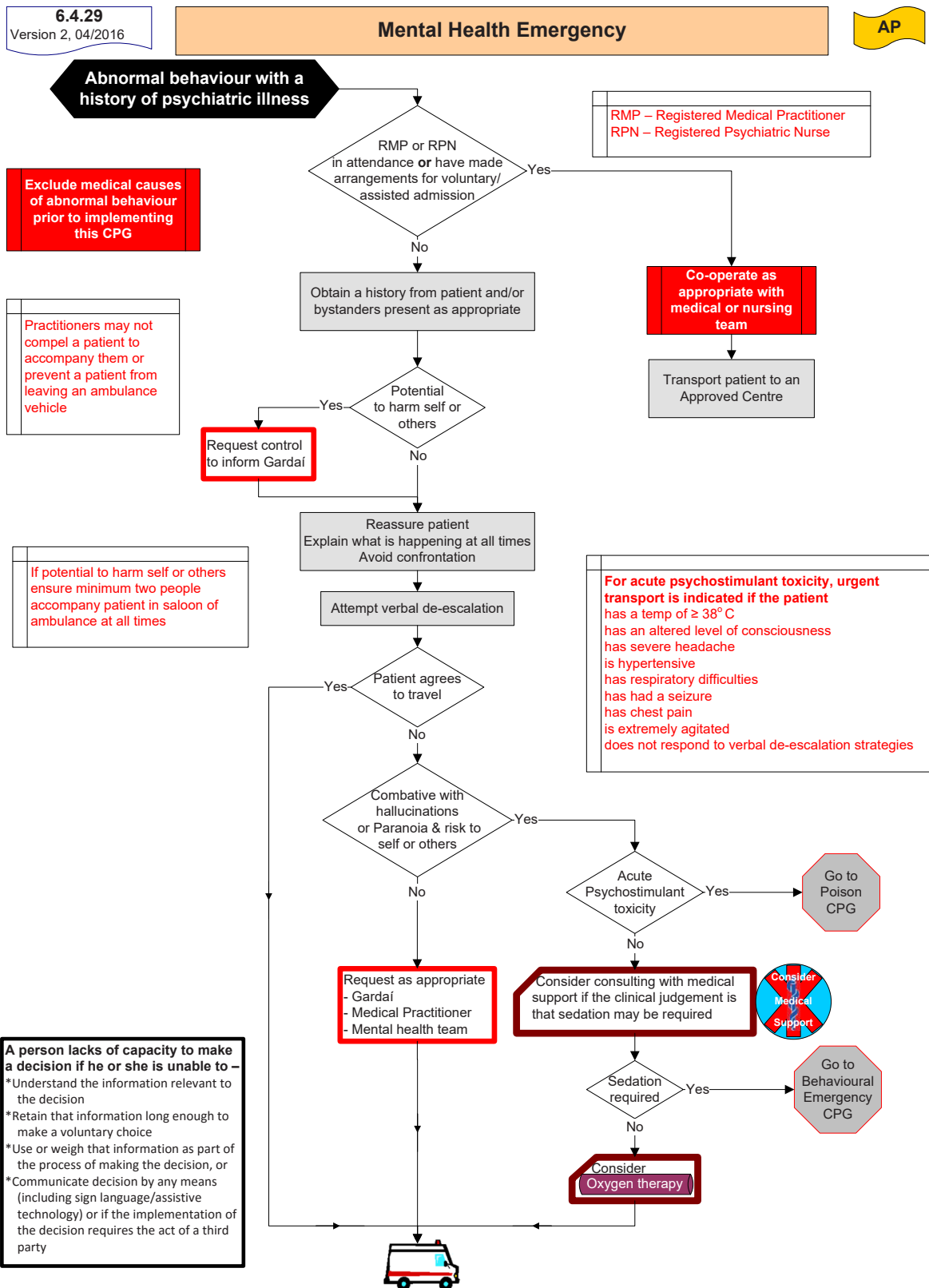
AHA, 2005, Part 9 Adult Stroke, Circulation 2005; 112; 111-120

A. Mohd Nor, et al, Agreement between ambulance paramedic- and physician- recorded neurological signs with Face Arm Speech Test (FAST) in acute stroke patients, Stroke 2004; 35;1355-1359

Jeffrey L Saver, et al, Prehospital neuroprotective therapy for acute stroke: results of the field administration of stroke therapy-Magnesium (FAST-MAG) pilot trial, Stroke 2004; 35; 106-108

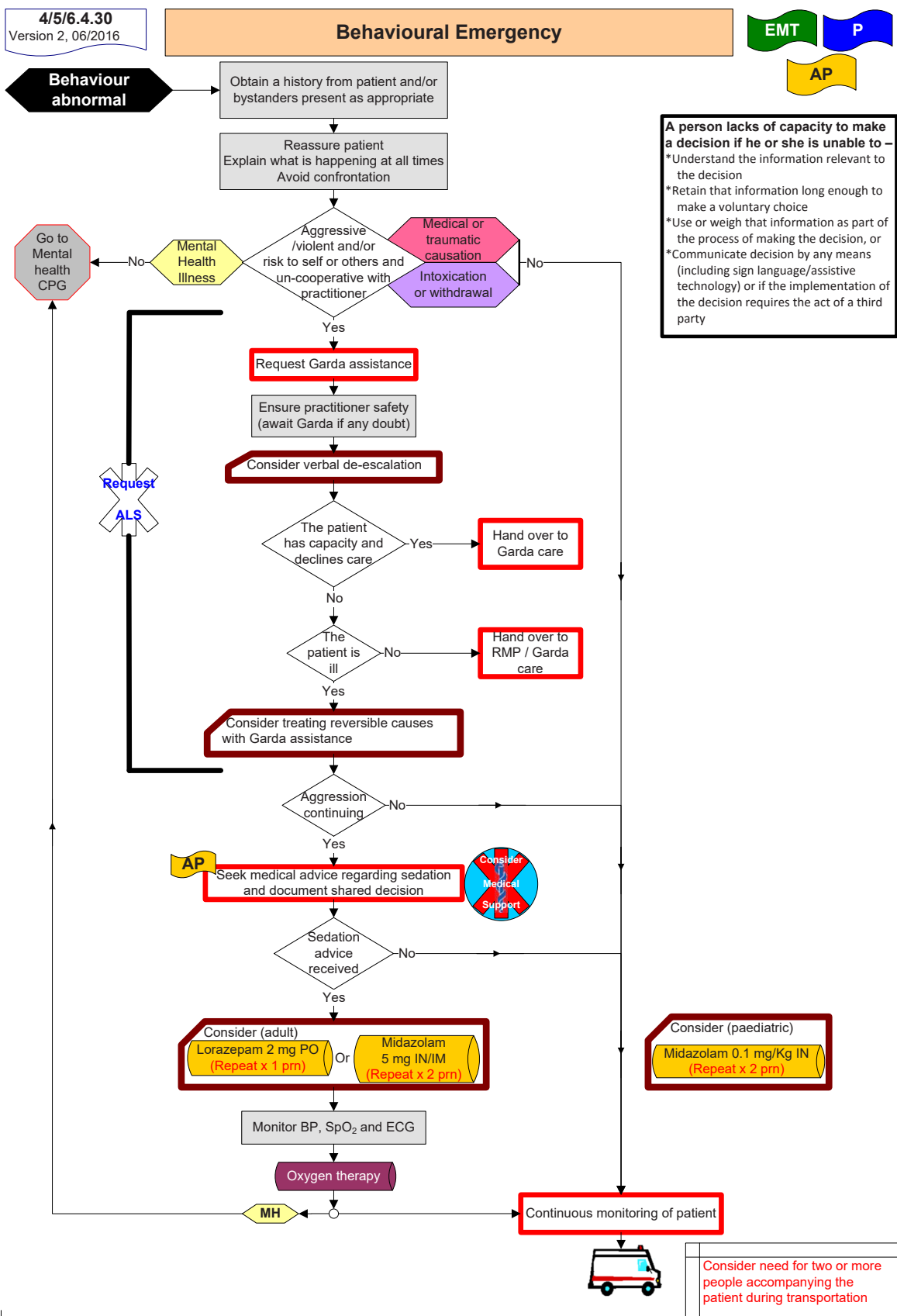
Werner Hacke MD, et al, 2008, Thrombolysis with Alteplase 3 to 4.5 Hours after Acute Ischemic Stroke, N Engl J Med 2008; 359:1317-29

## SECTION 4 – Medical Emergencies



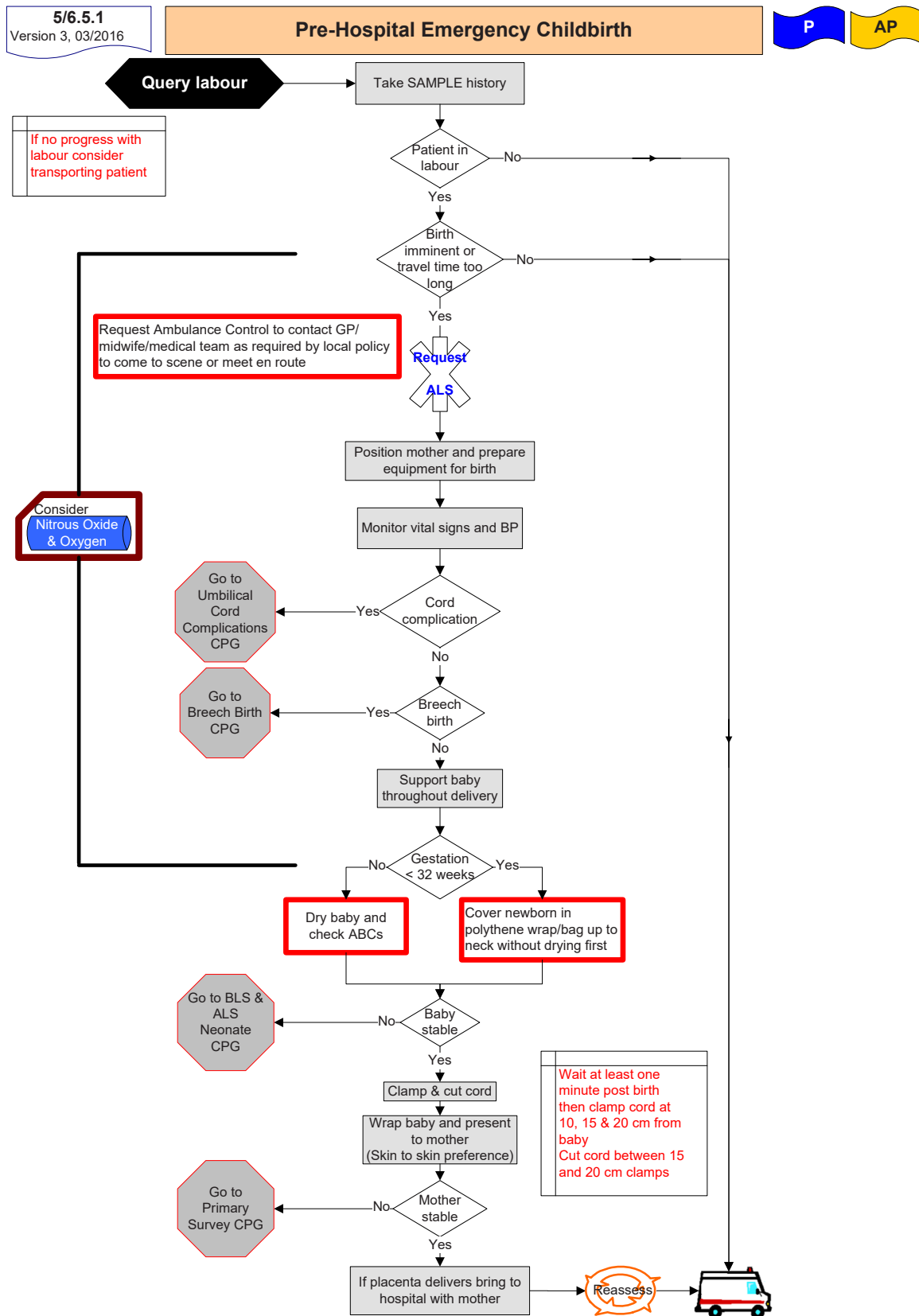
References: Management for patients with psychostimulant toxicity, Guidelines for Ambulance Services, 2006, National Drugs Strategy, Commonwealth of Australia.  
 Reference Guide to the Mental Health Act 2001, Mental Health Commission  
 HSE Mental Health Services

## SECTION 4 - Medical Emergencies



Reference: HSE Mental Health Services  
Assisted Decision-Making (Capacity) Act 2015

## SECTION 5 - Obstetric Emergencies



Reference: ILCOR Guidelines 2015

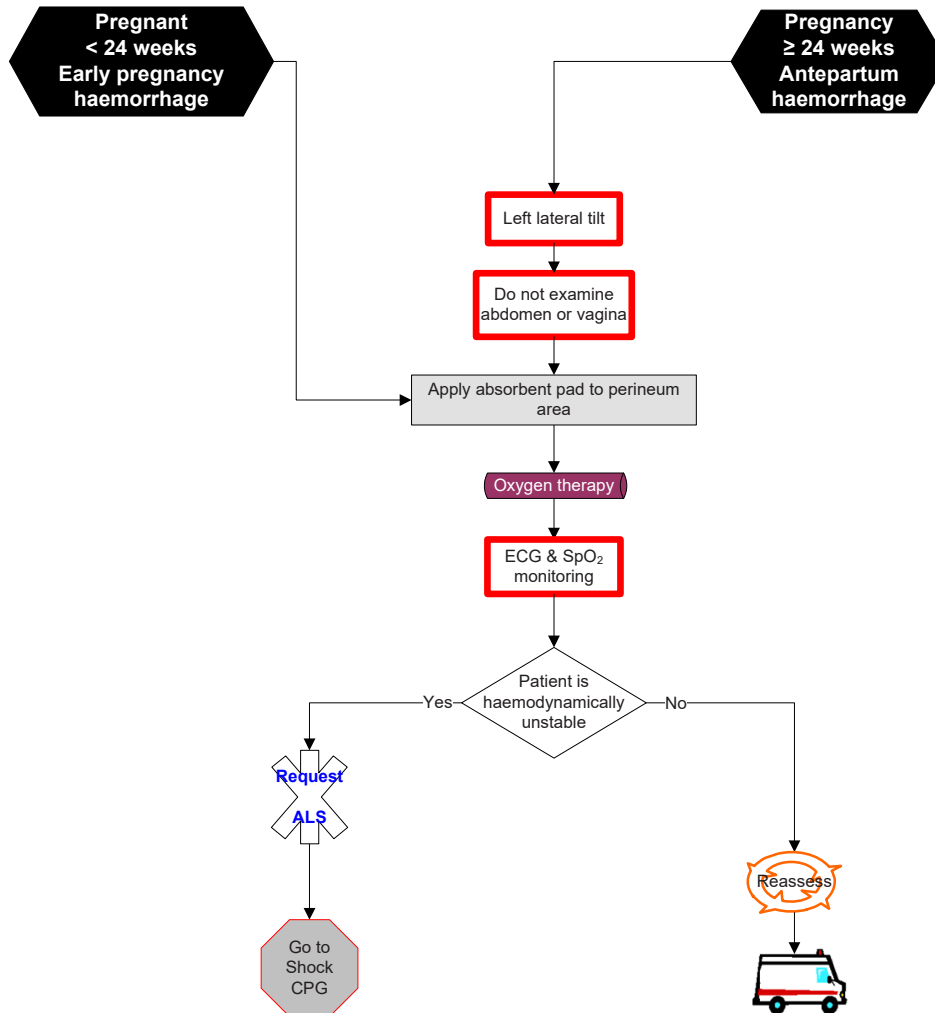
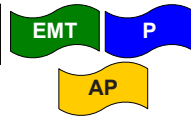




## SECTION 5 - Obstetric Emergencies

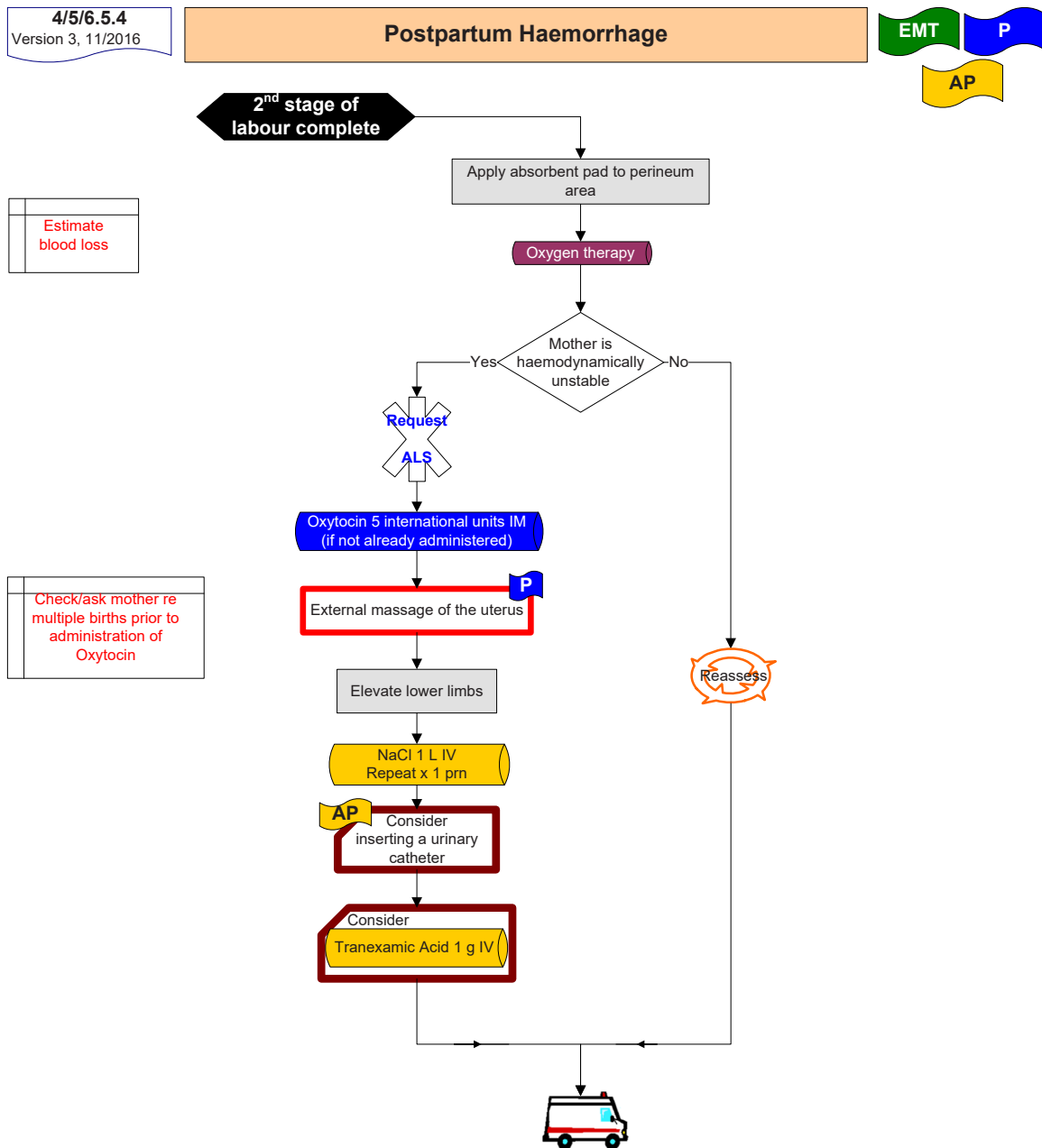
4/5/6.5.3  
Version 2, 03/2016

### PV Haemorrhage in Pregnancy



Reference: Sweet, BR, 2000, Mayes' Midwifery, 12<sup>th</sup> Edition, Bailliere Tindall

## SECTION 5 - Obstetric Emergencies

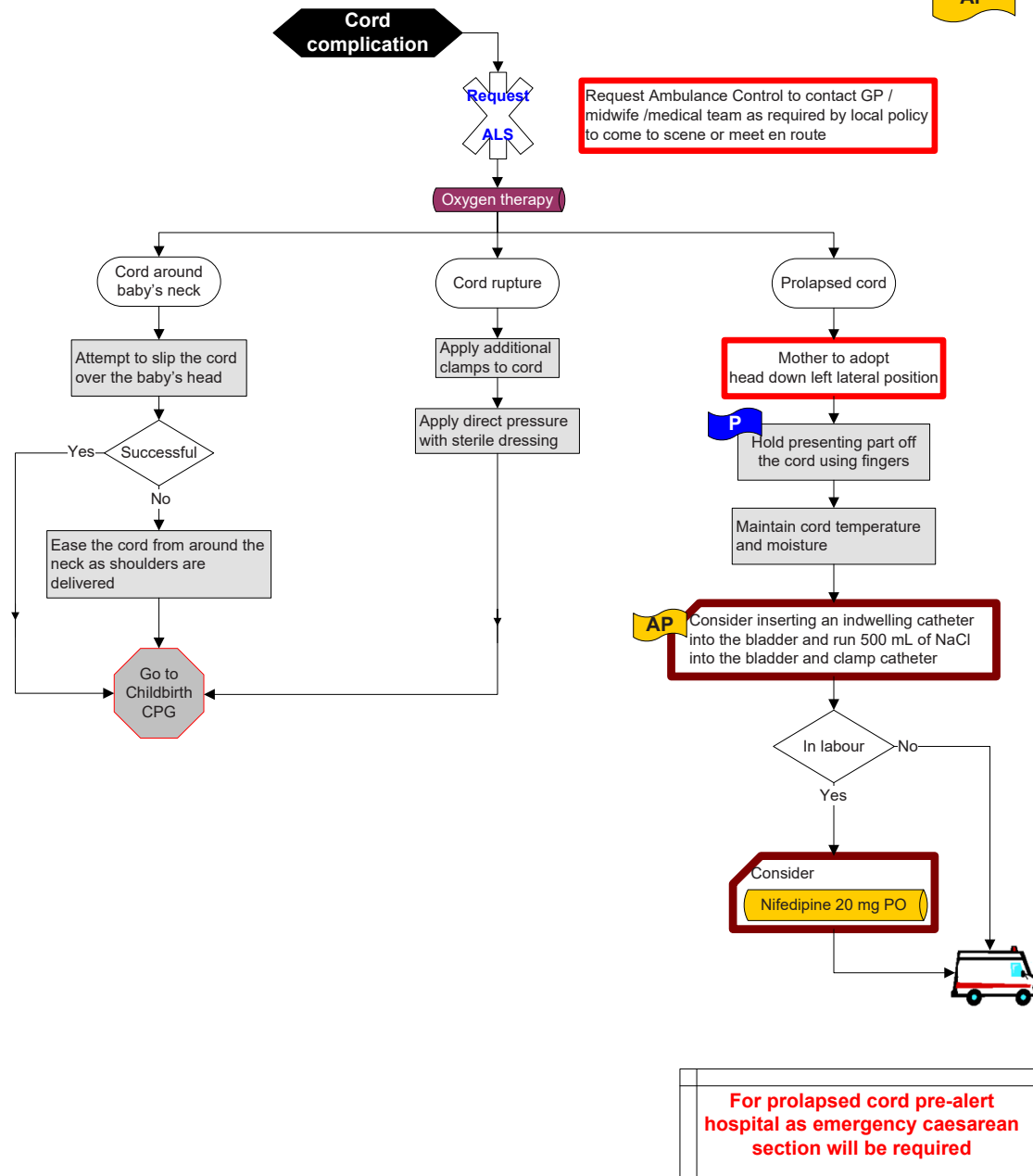
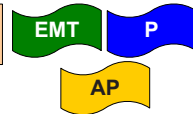


Reference: Institute of Obstetricians and Gynaecologists Royal College of Physicians of Ireland and Directorate of Strategy and Clinical Programmes Health Service Executive, 2014, Prevention and management of primary post partum haemorrhage – Guideline No 17

## SECTION 5 - Obstetric Emergencies

4/5/6.5.5  
Version 2, 03/2016

### Umbilical Cord Complications

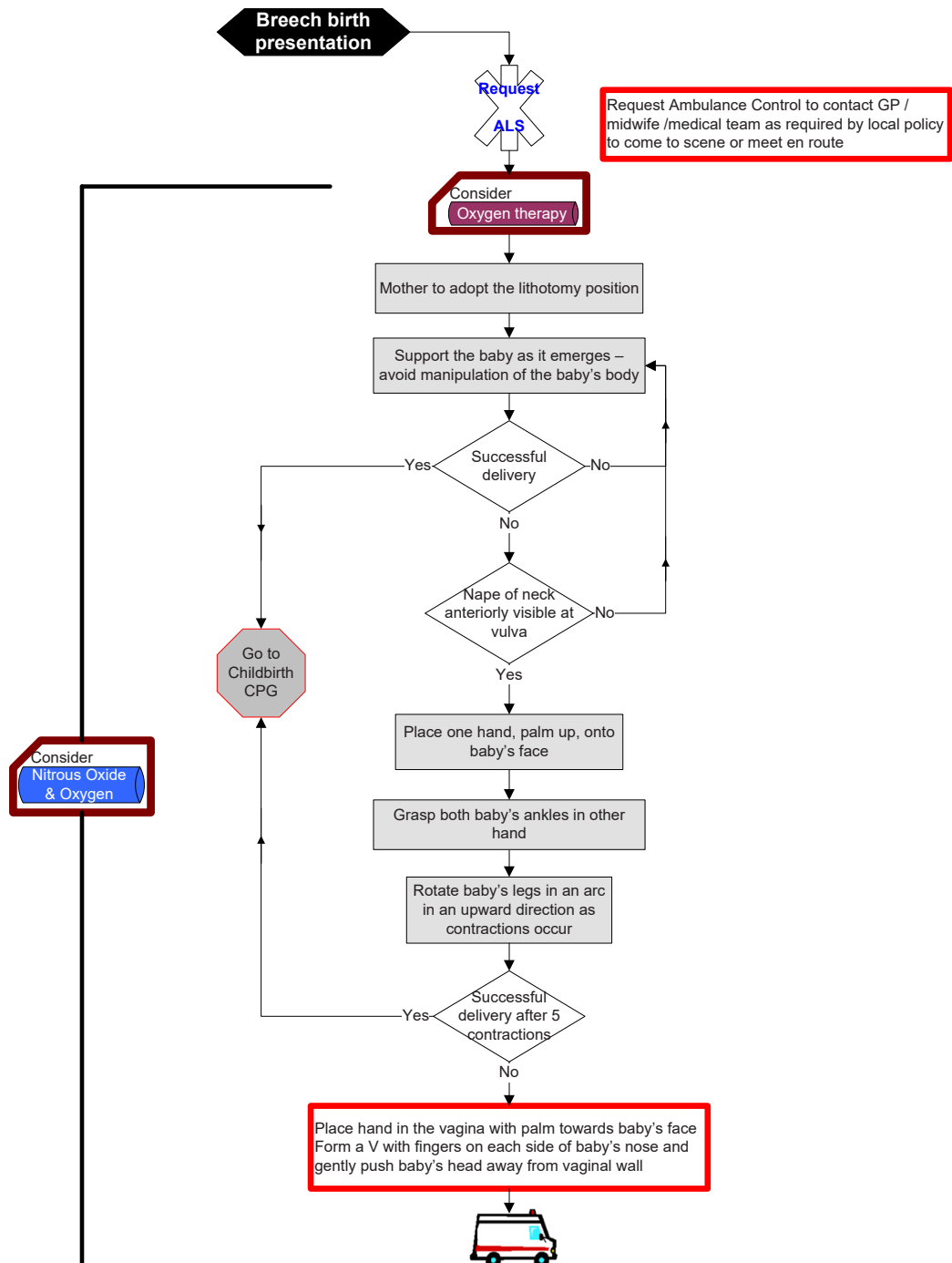
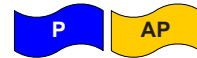


Reference: Sweet, BR, 2000, Mayes' Midwifery, 12<sup>th</sup> Edition, Bailliere Tindall  
Katz Z et al, 1988, Management of labor with umbilical cord prolaps: A 5 year study. Obstet. Gynecol. 72(2): 278-281  
Duley, LMM, 2002, Clinical Guideline No 1(B), Tocolytic Drugs for women in preterm labour, Royal College of Obstetricians and gynaecologists

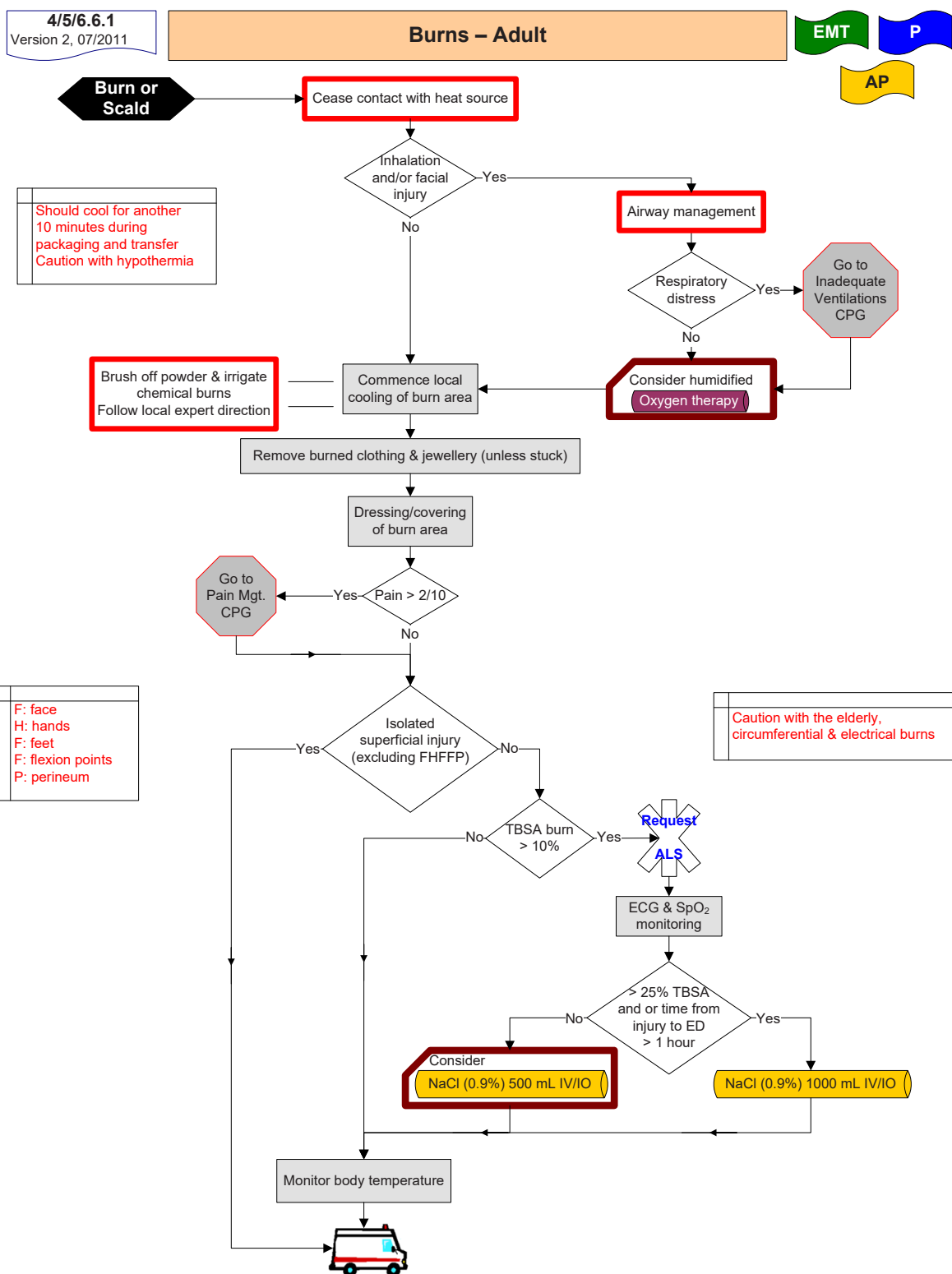
## SECTION 5 - Obstetric Emergencies

5/6.5.6  
Version 2, 03/2016

### Breech Birth

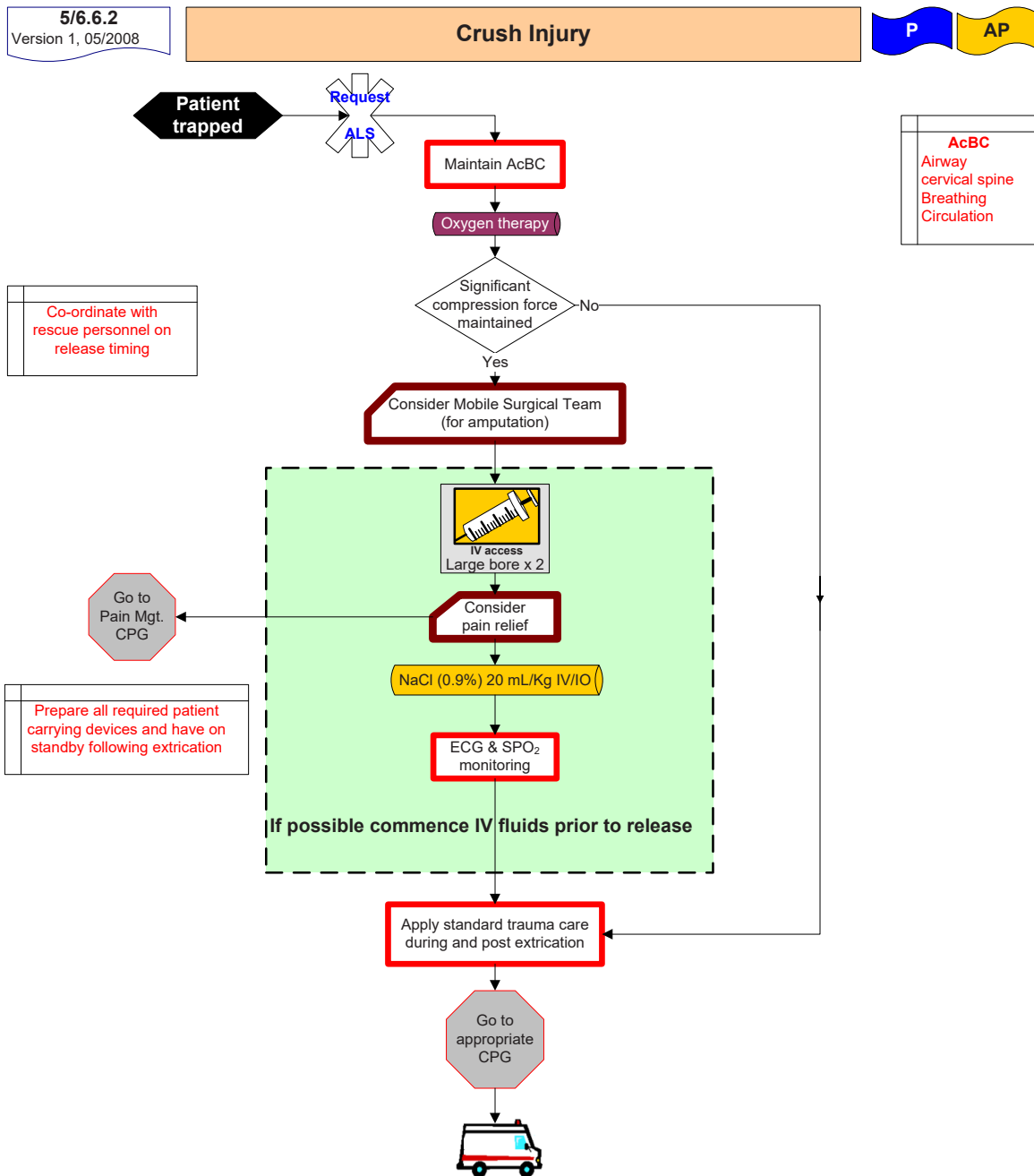


## SECTION 6 - Trauma



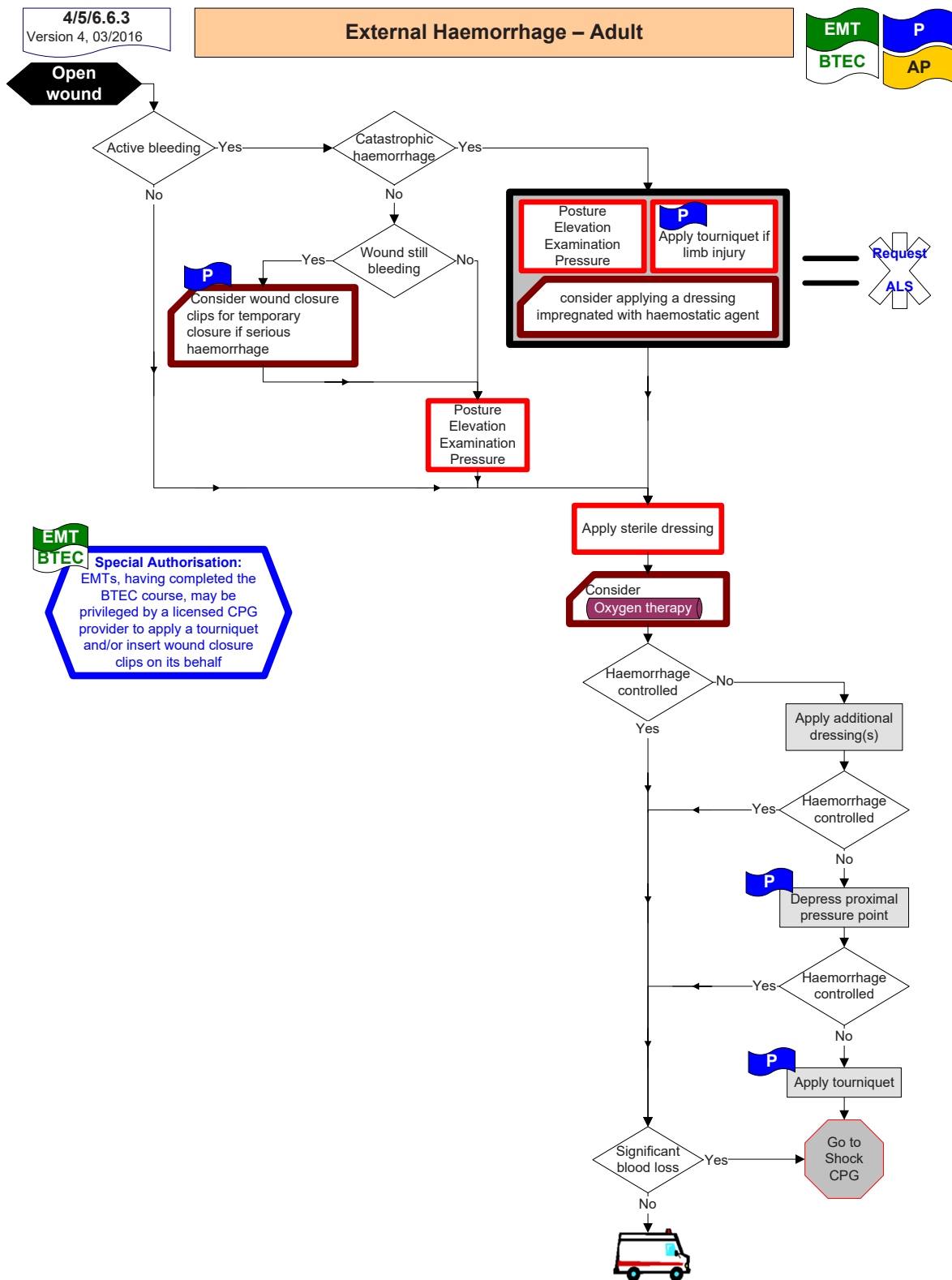
Reference: Allison, K et al, 2004, Consensus on the prehospital approach to burns patient management, Emerg Med J 2004; 21:112-114  
Sanders, M, 2001, Paramedic Textbook 2<sup>nd</sup> Edition, Mosby

## SECTION 6 - Trauma



Reference: Crush Injury Syndrome (# 7102) Patient Care Policy, Alameda County EMS Agency (CA)  
Crush Injuries, Clinical Practice Manual, Queensland Ambulance Service

## SECTION 6 - Trauma

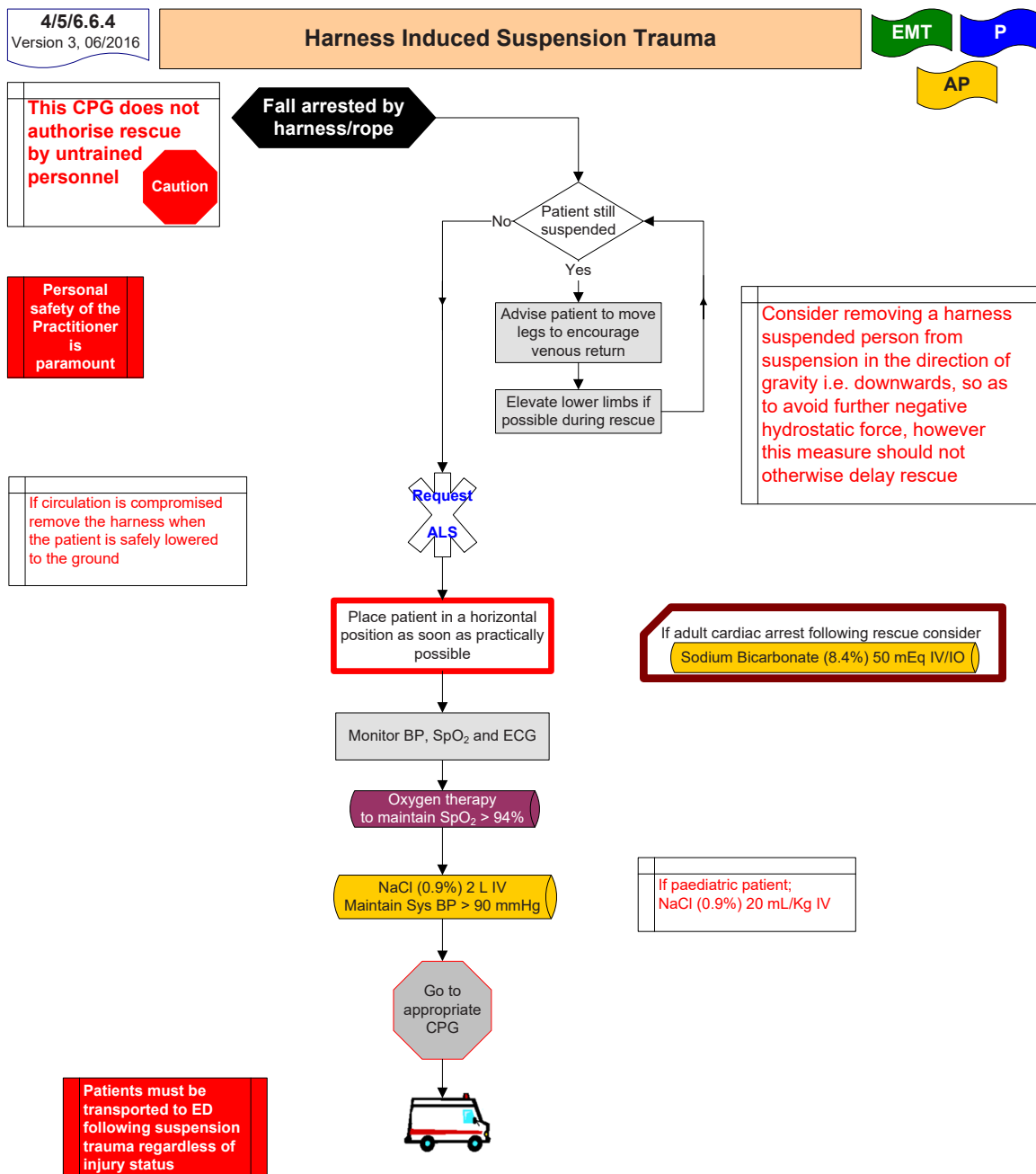


Reference: ILCOR Guidelines 2015

Granville-Chapman J, et al. Pre-hospital haemostatic dressings: A systematic review. Injury (2010), doi: 10.1016/j.injury.2010.09.037

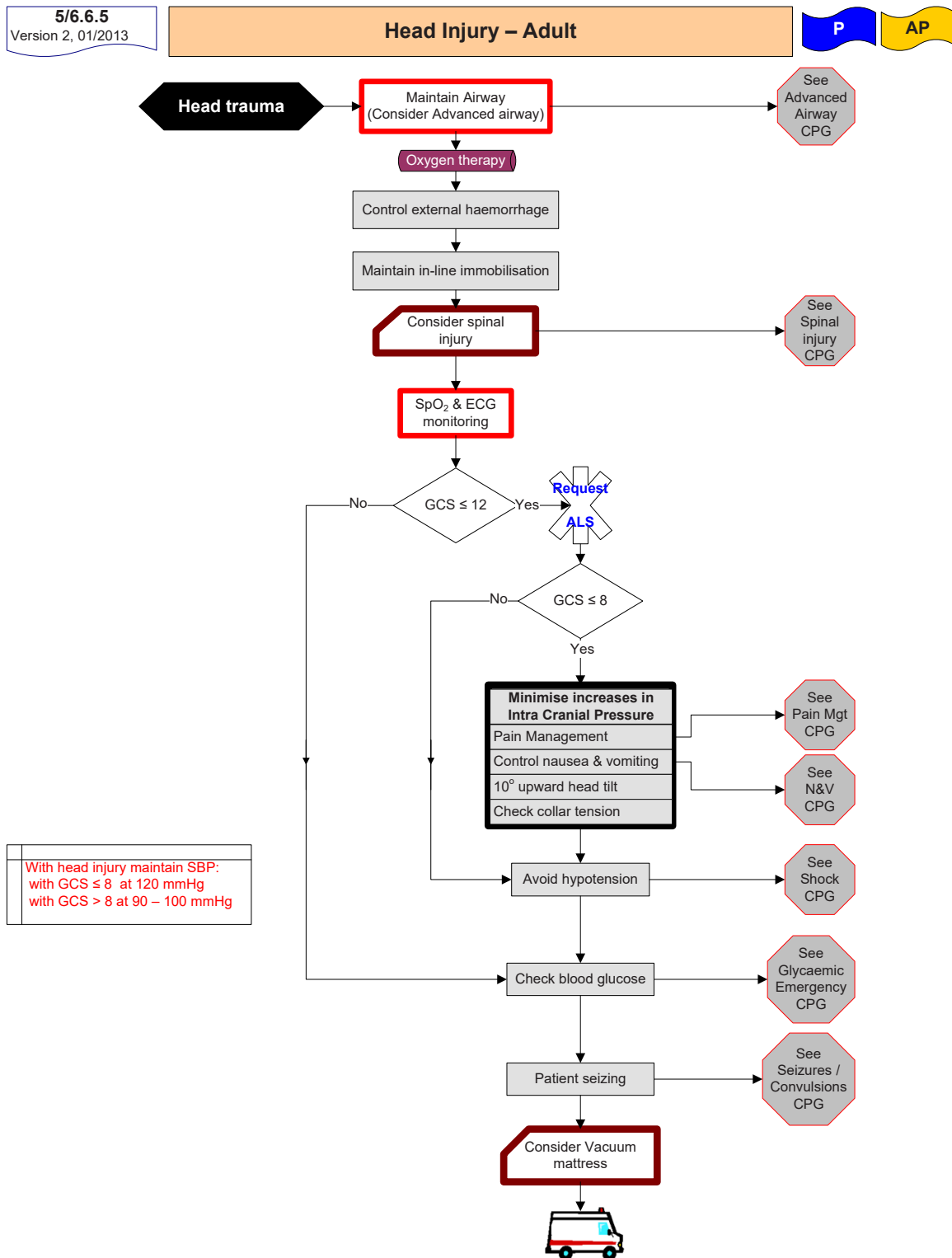


## SECTION 6 - Trauma



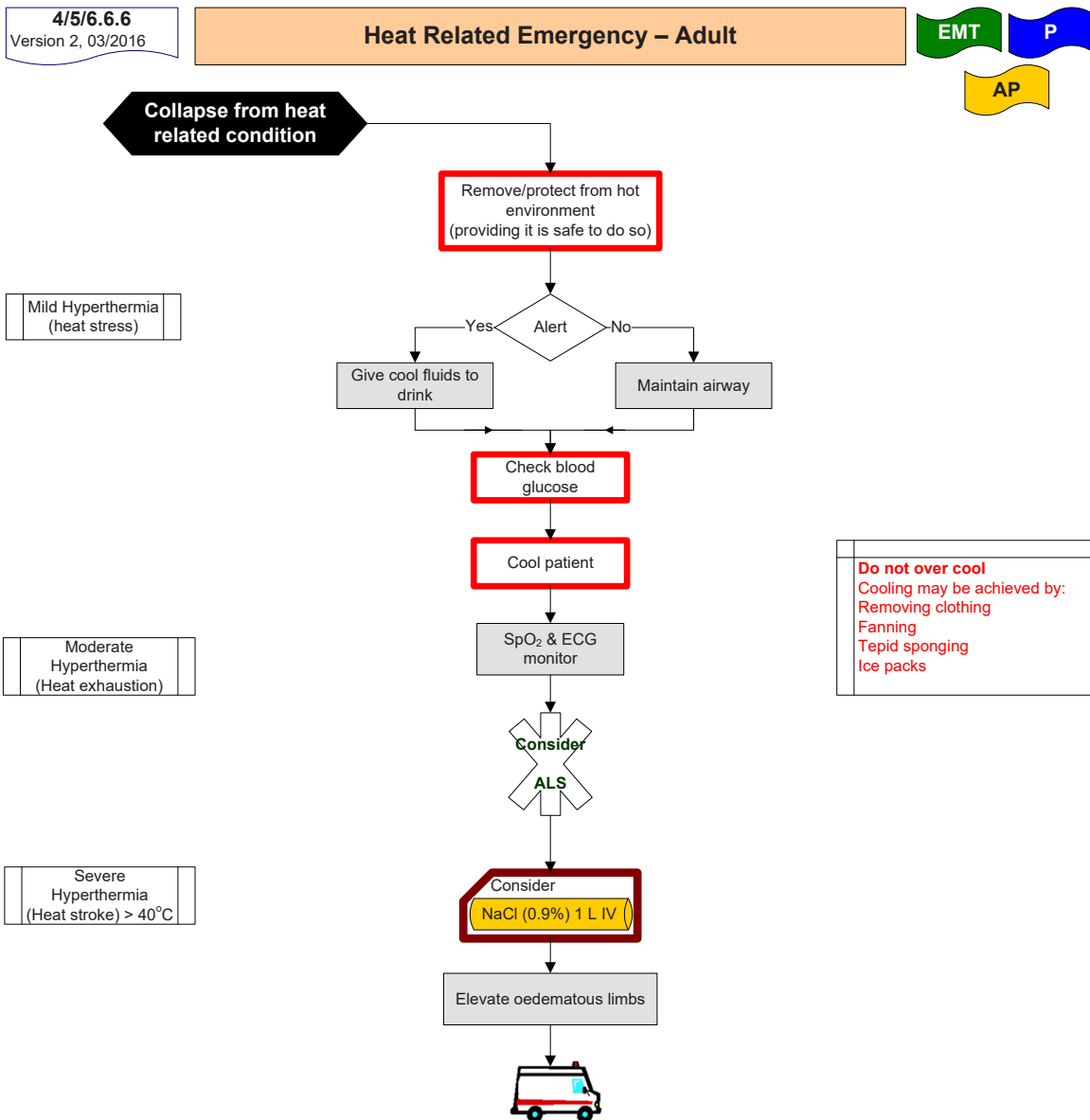
Reference: Adish A et al, 2009, Evidence-based review of the current guidance on first aid measures for suspension trauma, Health and Safety Executive (UK) Research report RR708  
 Australian Resuscitation Council, 2009, Guideline 9.1.5 Harness Suspension Trauma first aid management.  
 Thomassen O et al, Does the horizontal position increase risk of rescue death following suspension trauma?, *Emerg Med J* 2009;26:896-898  
 doi:10.1136/emj.2008.064931

## SECTION 6 - Trauma



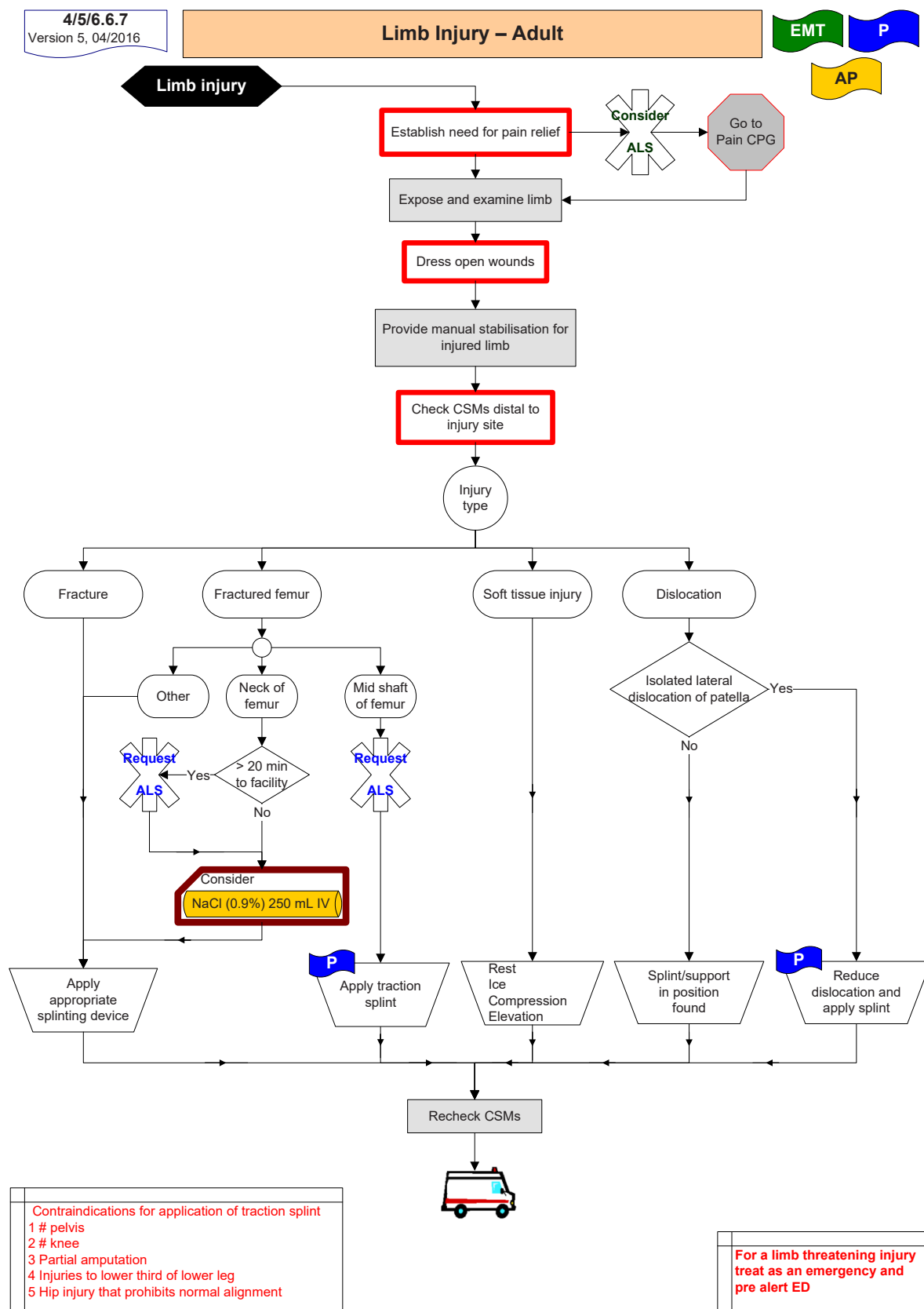
Reference; Mc Swain, N, 2011, PHTLS Prehospital Trauma Life Support 7<sup>th</sup> Edition, Mosby

## SECTION 6 - Trauma



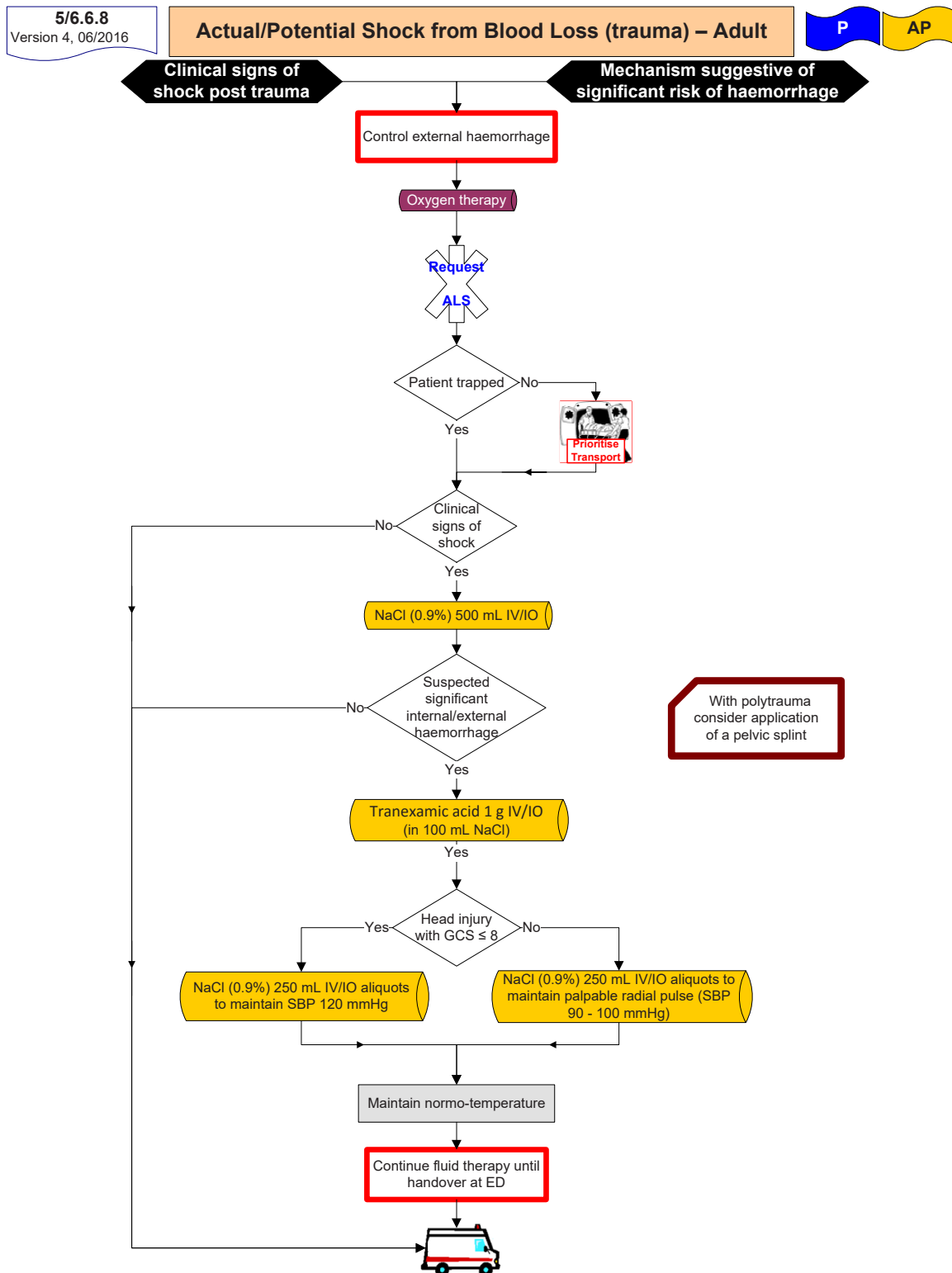
Reference: ILCOR Guidelines 2015  
European Resuscitation Guidelines 2010  
RFDS, 2011, Primary Clinical Care Manual

## SECTION 6 - Trauma



Reference: An algorithm guiding the evaluation and treatment of acute primary patellar dislocations, Mehta VM et al. Sports Med Arthrosc. 2007 Jun;15(2):78-81

## SECTION 6 - Trauma



Reference: Gruen, R. L. and M. C. Reade (2012). "Administer tranexamic acid early to injured patients at risk of substantial bleeding." *BMJ* 345: e7133  
 Leech, C., et al. (2014). "Log-rolling a blunt major trauma patient is inappropriate in the primary survey." *Emerg Med J* 31(1): 86

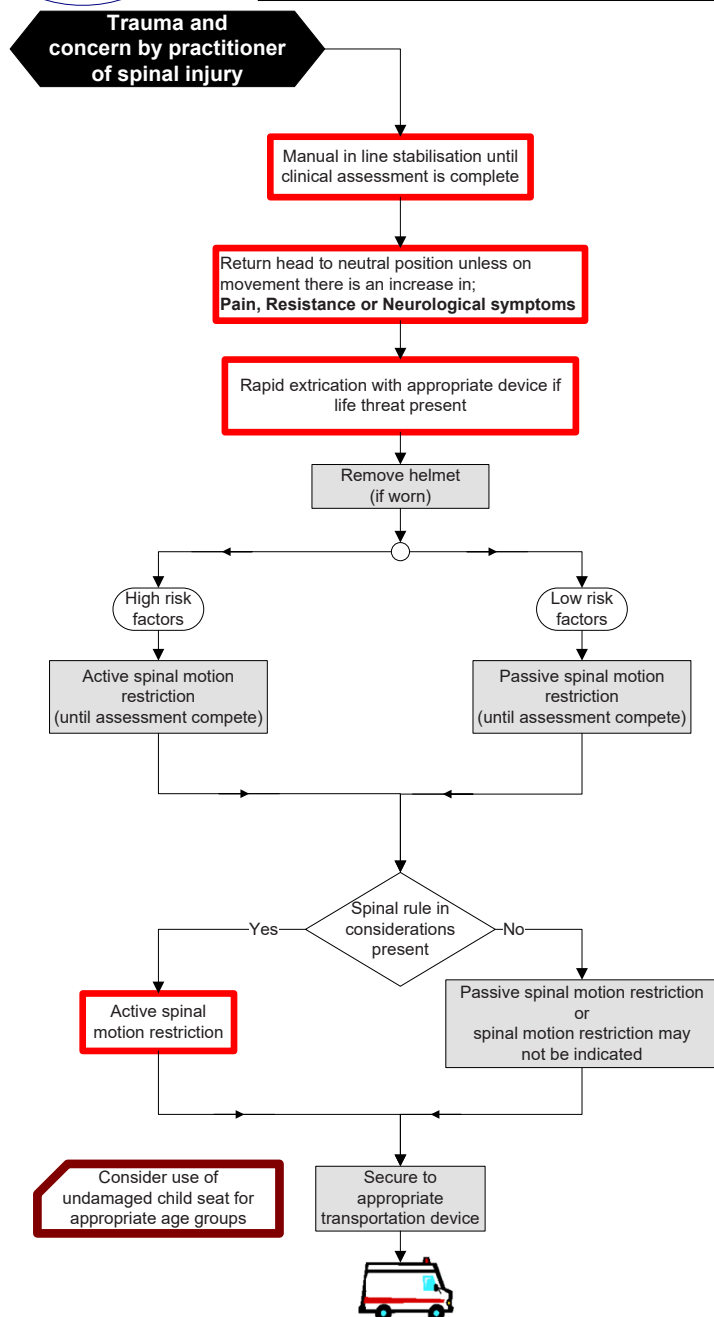
## SECTION 6 - Trauma

5/6.6.9  
Version 3, 06/2016

### Spinal Injury Management

P

AP



**High risk factors:-** any of the following;

- ☐ dangerous mechanism of injury
- ☐ fall from a height of greater than 1 metre or 5 steps
- ☐ axial load to the head or base of the spine

– for example;

- ☐ diving, high-speed motor vehicle collision, rollover motor accident, ejection from a motor vehicle, accident involving motorised recreational vehicle, bicycle collision, horse riding accident, pedestrian v vehicle.
- ☐ impaired awareness (alcohol/ drug intoxication, confused /uncooperative or ALoC)
- ☐ age 65 years or older, with any of the above
- ☐ age 2 years or younger incapable of verbal communication, with any of the above

**Low risk factors:-** any two or more of;

- ☐ involved in a minor rear-end motor vehicle collision
- ☐ comfortable in a sitting position
- ☐ ambulatory at any time since the injury
- ☐ no midline cervical spine tenderness
- ☐ no spinal column/ midline pain

**And** are able to actively rotate their neck 45 degrees to the left and right

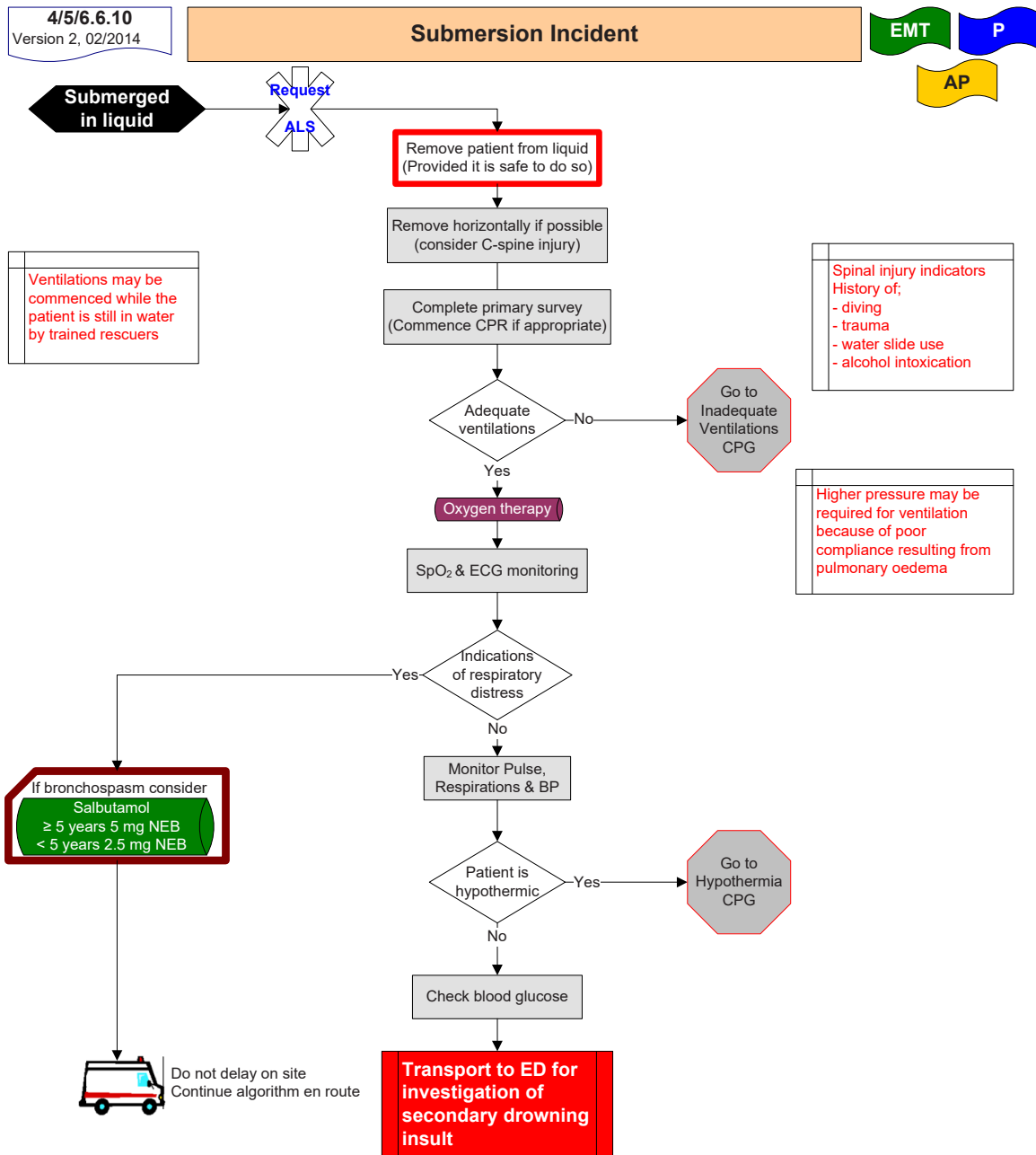
**Spinal injury rule in considerations;**

- ☐ any significant distracting injuries
- ☐ impaired awareness (alcohol/ drug intoxication, confused /uncooperative or ALoC)
- ☐ immediate onset of spinal/ midline back pain
- ☐ hand or foot weakness (motor issue)
- ☐ altered or absent sensation in the hands or feet (sensory issue)
- ☐ priapism
- ☐ history of past spinal problems, including previous spinal surgery or conditions that predispose to instability of the spine.
- ☐ Unable to actively rotate their neck 45 degrees to the left and right.

**PHECC Spinal Injury Management Standard**

- ☐ **Active spinal motion restriction;** using manual inline techniques with or without spinal injury management devices to reduce spinal column motion.
- ☐ **Passive spinal motion restriction;** requesting the patient to minimise his/her movement without external intervention and permitting the patient to adopt a position of comfort.

## SECTION 6 - Trauma

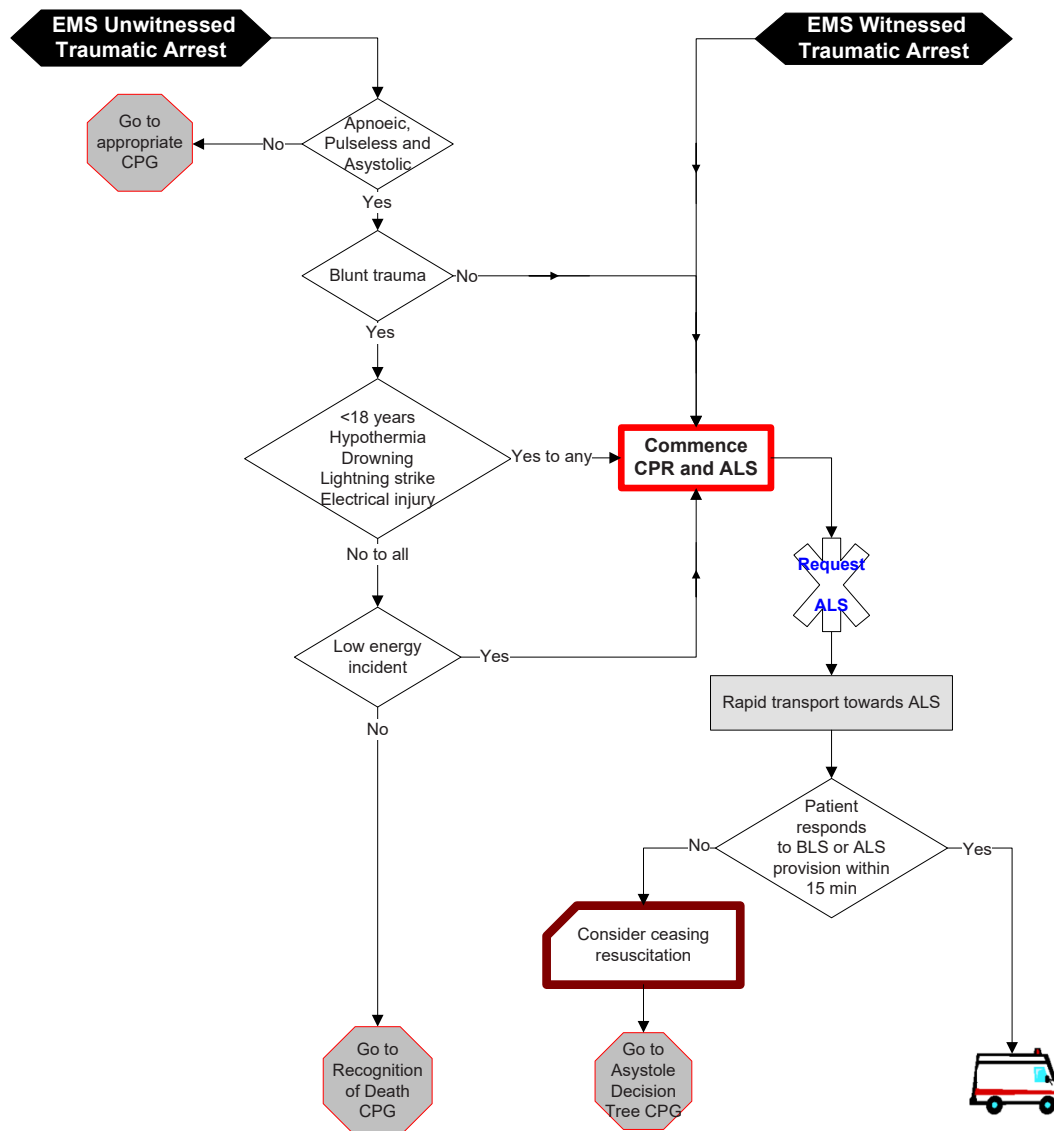


Reference: Golden, F & Tipton M, 2002, Essentials of Sea Survival, Human Kinetics  
 Verie, M, 2007, Near Drowning, E medicine, [www.emedicine.com/ped/topic20570.htm](http://www.emedicine.com/ped/topic20570.htm)  
 Shepherd, S, 2005, Submersion Injury, Near Drowning, E Medicine, [www.emedicine.com/emerg/topic744.htm](http://www.emedicine.com/emerg/topic744.htm)  
 AHA, 2005, Part 10.3: Drowning, Circulation 2005;112;133-135  
 Soar, J et al, 2005, European Resuscitation Council Guidelines for Resuscitation 2005, Section 7. Cardiac arrest in special circumstances, Resuscitation (2005) 6751, S135-S170

## SECTION 6 - Trauma

5/6.6.11  
Version 1, 05/2008

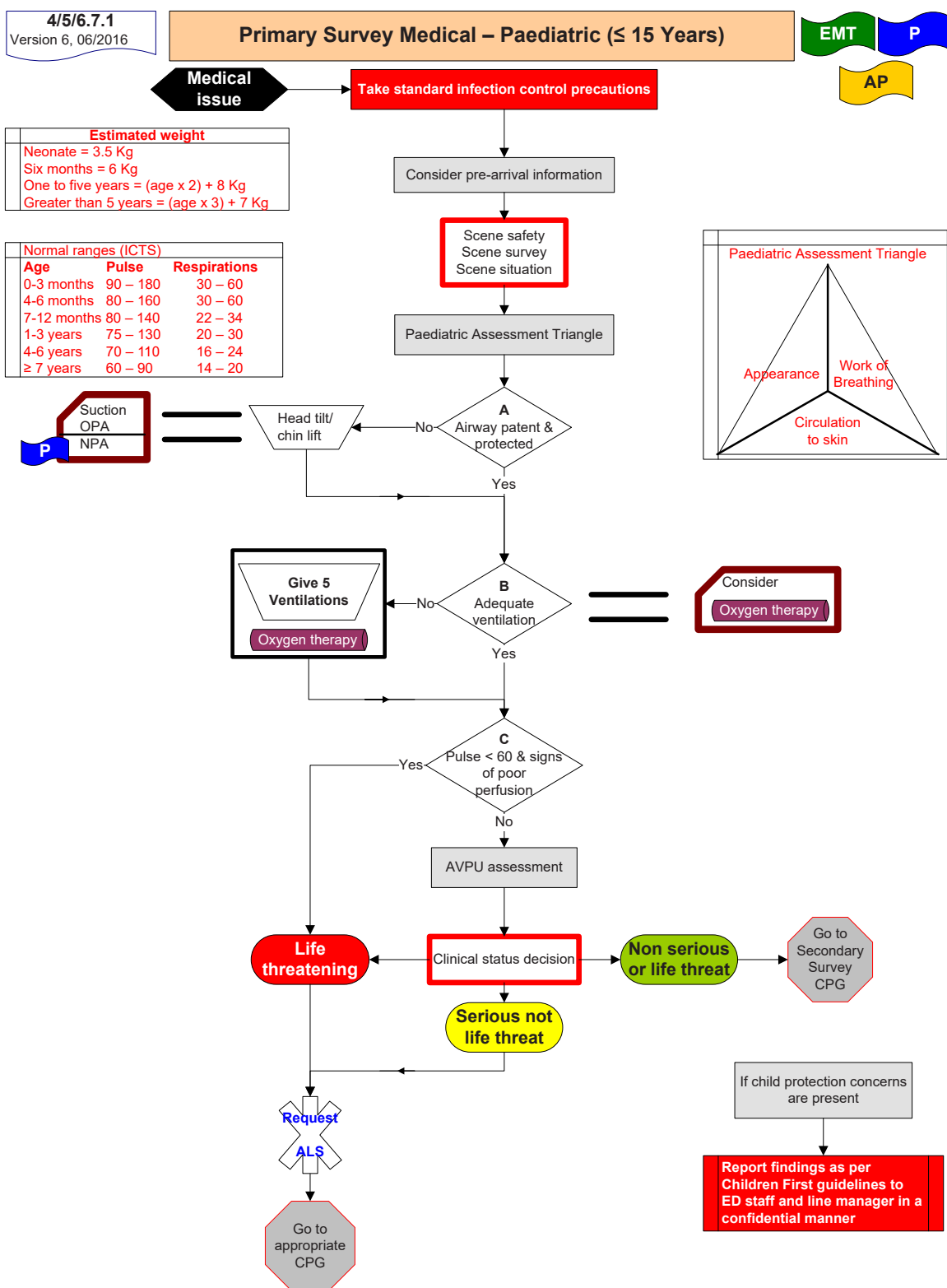
### Traumatic Cardiac Arrest – Adult



Reference: Hopson, L et al, 2003, Guidelines for withholding or termination of resuscitation in prehospital traumatic cardiac arrest, Position paper for National Association of EMS Physicians, Prehospital Emergency Care, Vol 7 p141-146

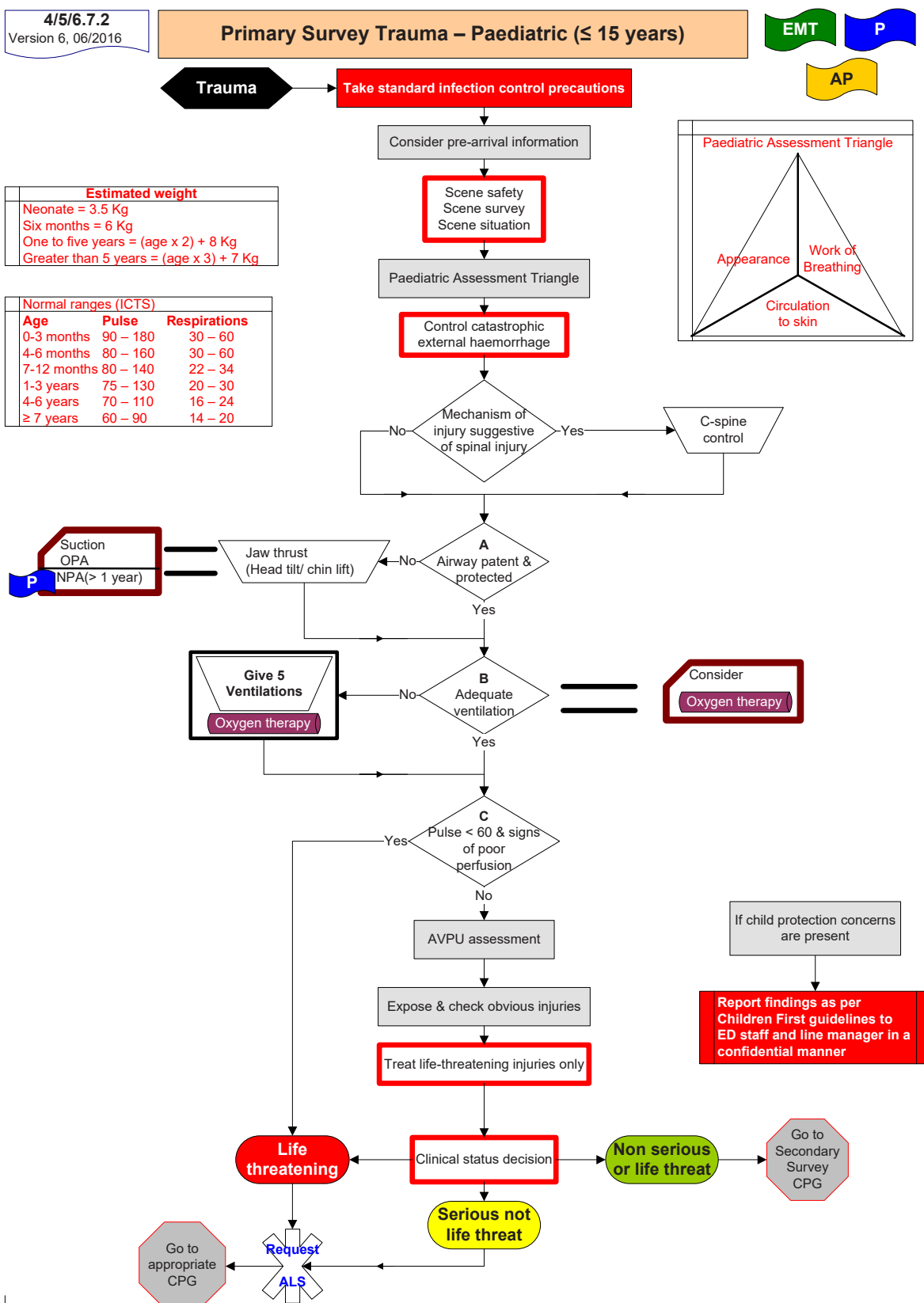


## SECTION 7 – Paediatric Emergencies



Reference:  
ILCOR Guidelines 2015, American Academy of Pediatrics, 2000, Pediatric Education for Prehospital Professionals  
Department of Children and Youth Affairs, 2011, Children First: National Guidance for the Protection and Welfare of Children  
Irish Children's Triage System: National Emergency Medicine Programme, 2015

## SECTION 7 - Paediatric Emergencies

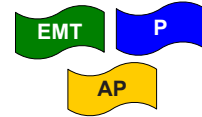


Reference:  
ILCOR Guidelines 2015, American Academy of Pediatrics, 2000, Pediatric Education for Prehospital Professionals  
Department of Children and Youth Affairs, 2011, Children First: National Guidance for the Protection and Welfare of Children  
Irish Children's Triage System: National Emergency Medicine Programme, 2015

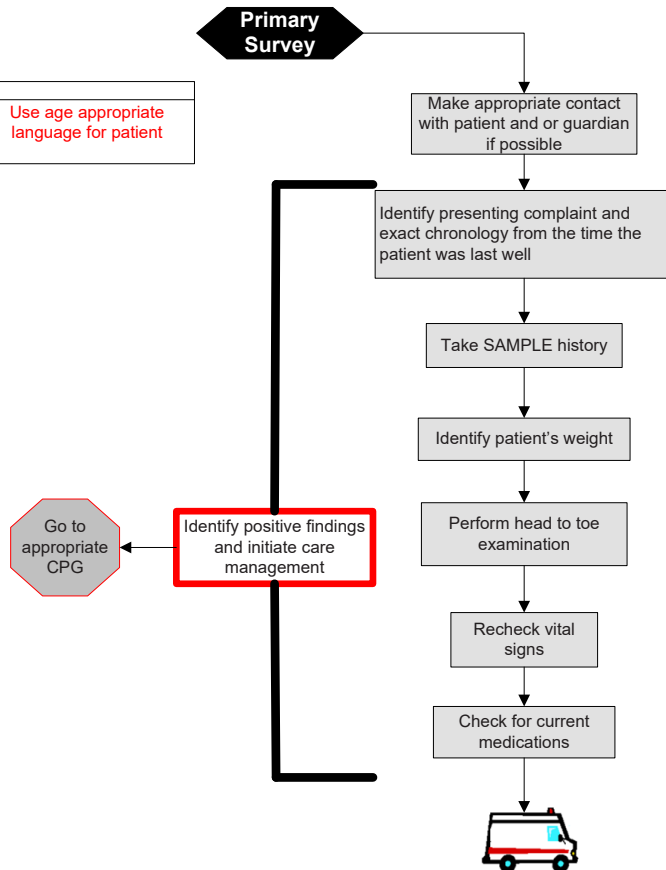
## SECTION 7 – Paediatric Emergencies

4/5/6.7.4  
Version 4, 06/2016

### Secondary Survey – Paediatric ( ≤ 15 years)



Use age appropriate language for patient



Normal ranges (ICTS)		
Age	Pulse	Respirations
0-3 months	90 – 180	30 – 60
4-6 months	80 – 160	30 – 60
7-12 months	80 – 140	22 – 34
1-3 years	75 – 130	20 – 30
4-6 years	70 – 110	16 – 24
≥ 7 years	60 – 90	14 – 20

Estimated weight	
Neonate	= 3.5 Kg
Six months	= 6 Kg
One to five years	= (age x 2) + 8 Kg
Greater than 5 years	= (age x 3) + 7 Kg

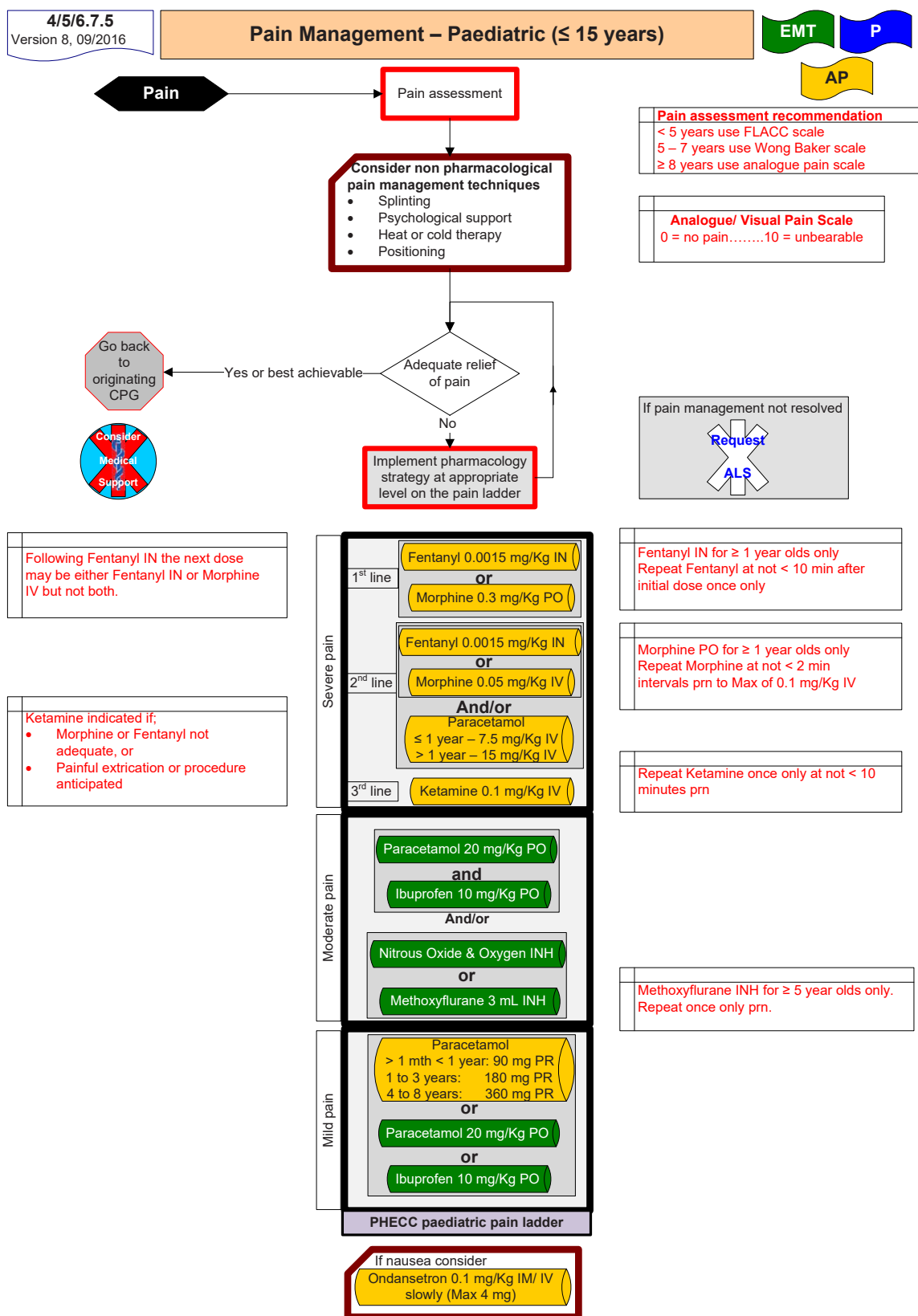
Children and adolescents should always be examined with a chaperone (usually a parent) where possible

If child protection concerns are present

Report findings as per Children First guidelines to ED staff and line manager in a confidential manner

Reference:  
Miall, Lawrence et al, 2003, Paediatrics at a Glance, Blackwell Publishing  
Department of Children and Youth Affairs, 2011, Children First: National Guidance for the Protection and Welfare of Children  
Luscombe, M et al 2010, BMJ, Weight estimation in paediatrics: a comparison of the APLS formula and the formula 'Weight=3(age)+7'  
Irish Children's Triage System: National Emergency Medicine Programme, 2015

## SECTION 7 – Paediatric Emergencies



Reference: Coffey, F., et al. (2014). "STOP!: a randomised, double-blind, placebo-controlled study of the efficacy and safety of methoxyflurane for the treatment of acute pain." *Emerg Med J* 31(8): 613-618

Jennings, P. A., et al. (2011). "Ketamine as an analgesic in the pre-hospital setting: a systematic review." *Acta Anaesthesiol Scand* 55(6): 638-643

Park, C. L., et al. (2010). "Prehospital analgesia: systematic review of evidence." *J R Army Med Corps* 156(4 Suppl 1): 295-300

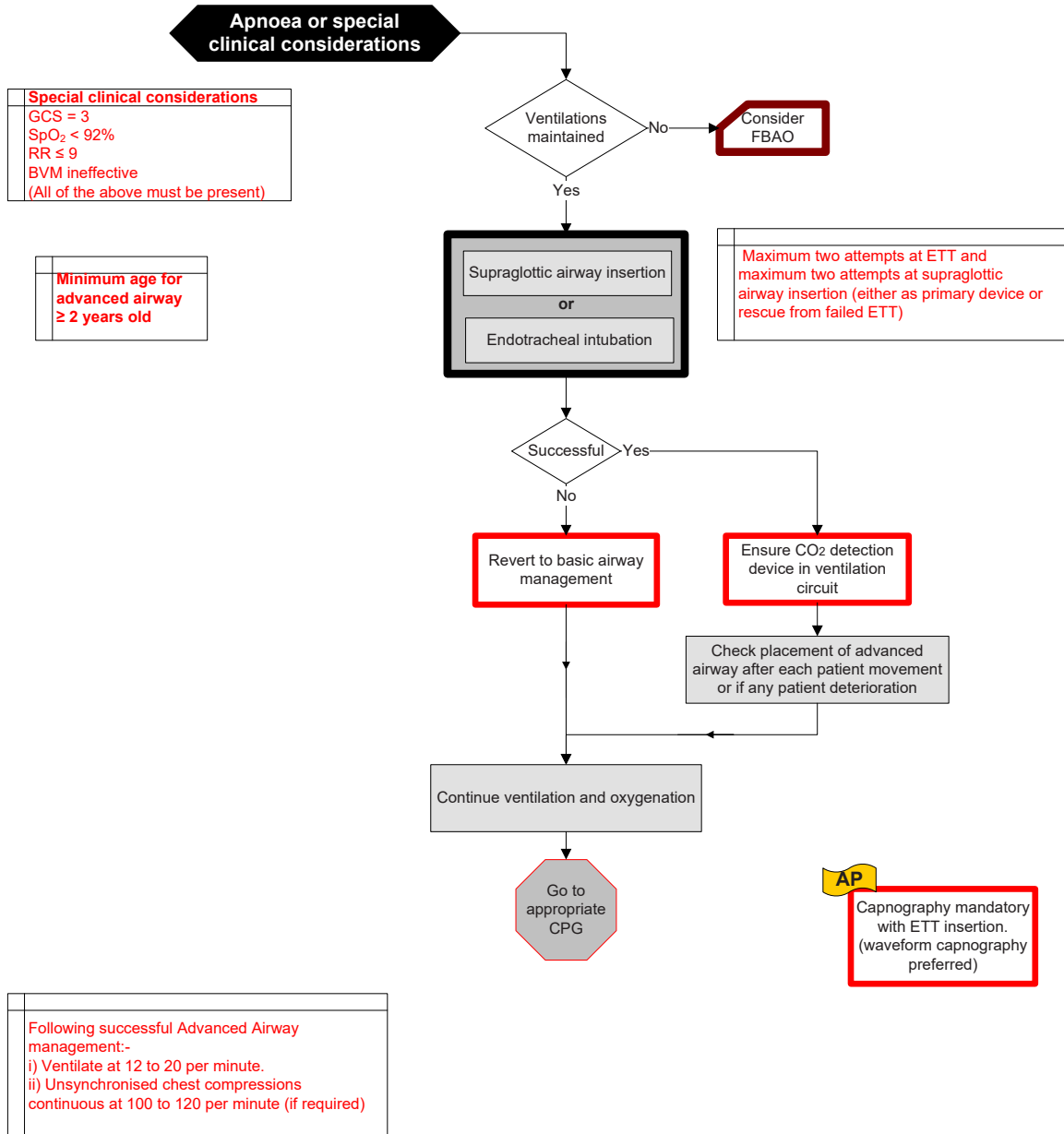
Leung, L. (2012). "From ladder to platform: a new concept for pain management." *J Prim Health Care* 4(3): 254-258

## SECTION 7 – Paediatric Emergencies

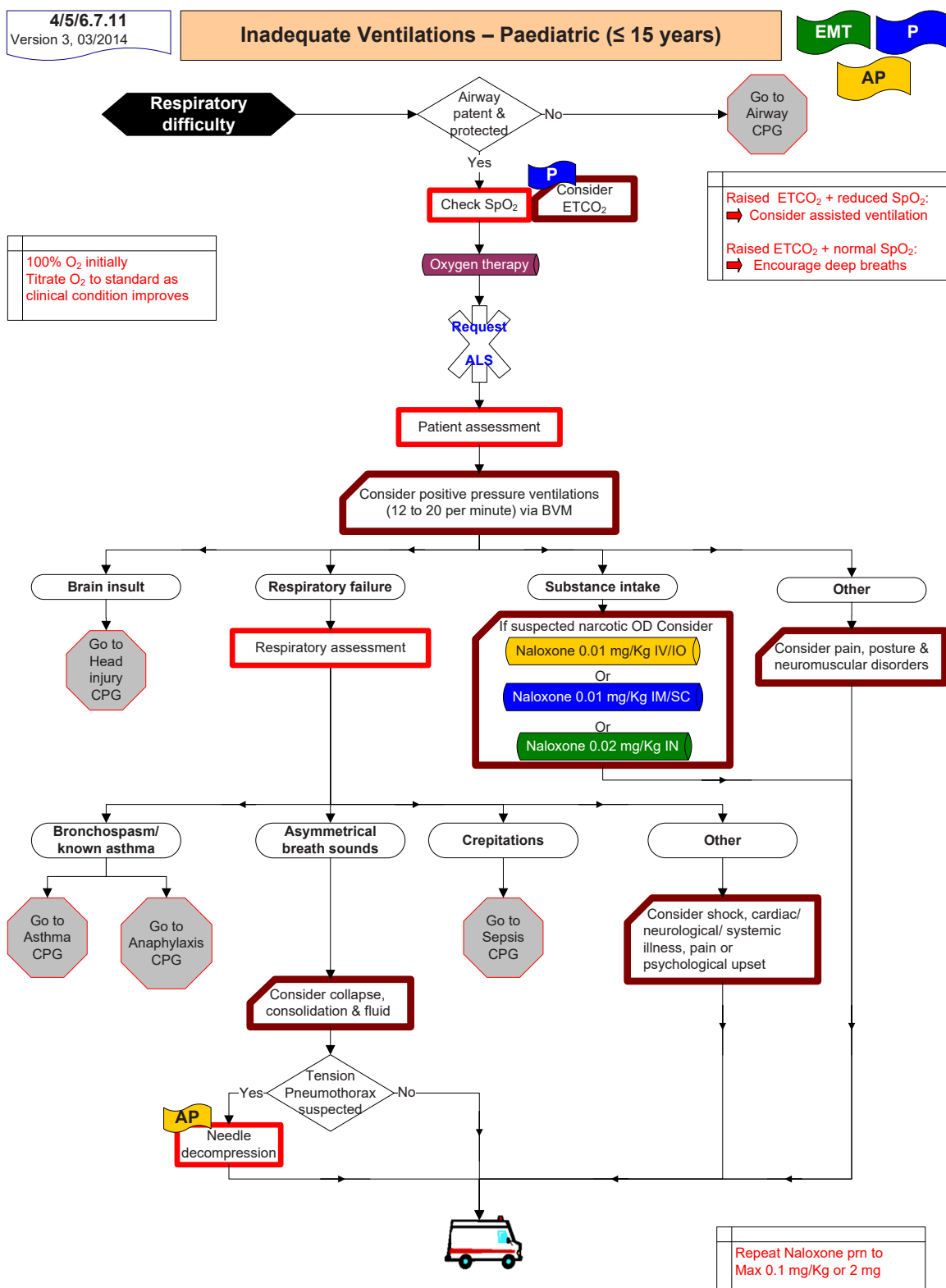
**6.7.10**  
Version 3, 03/2016

### Advanced Airway Management – Paediatric (≤ 15 years)

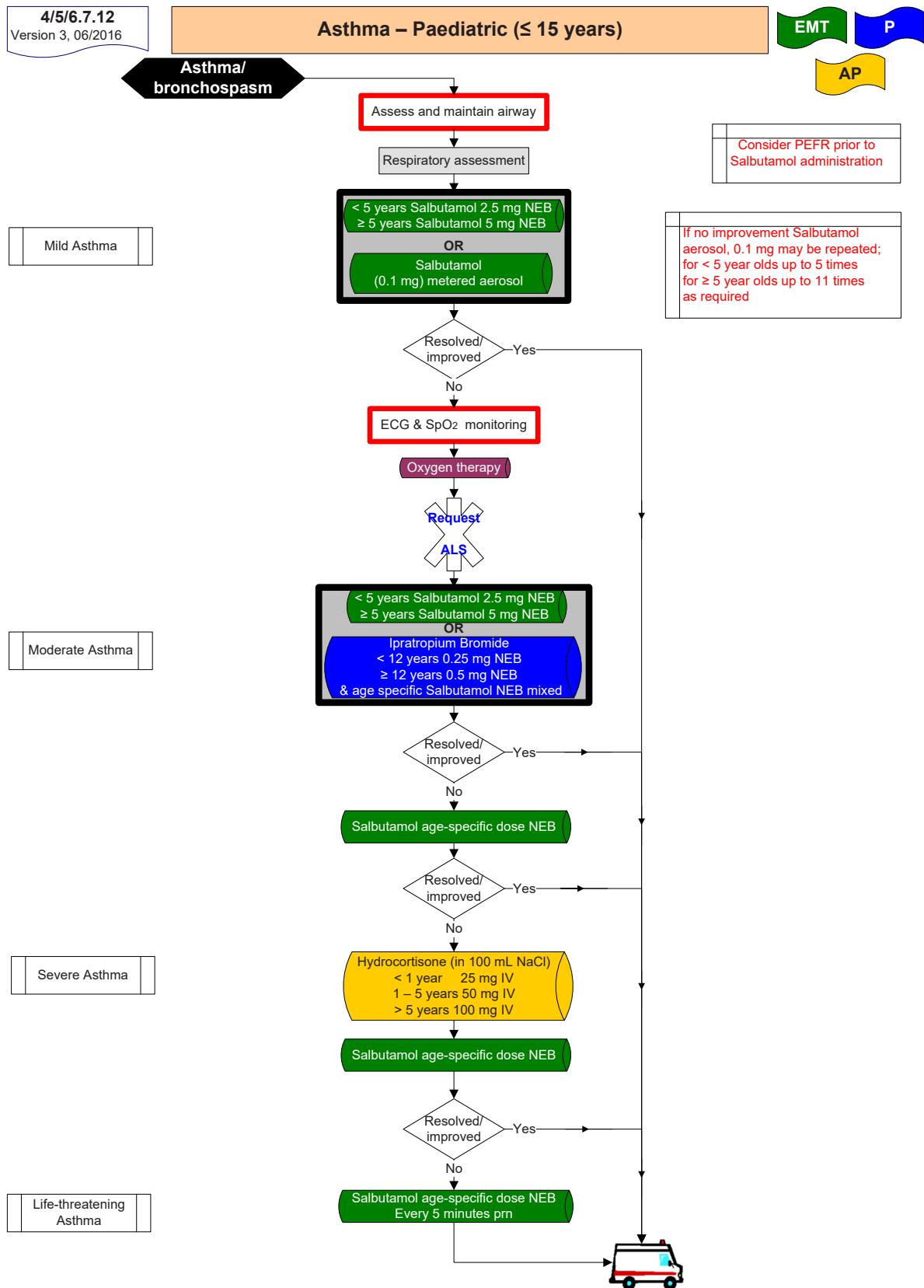
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## SECTION 7 – Paediatric Emergencies



## SECTION 7 – Paediatric Emergencies

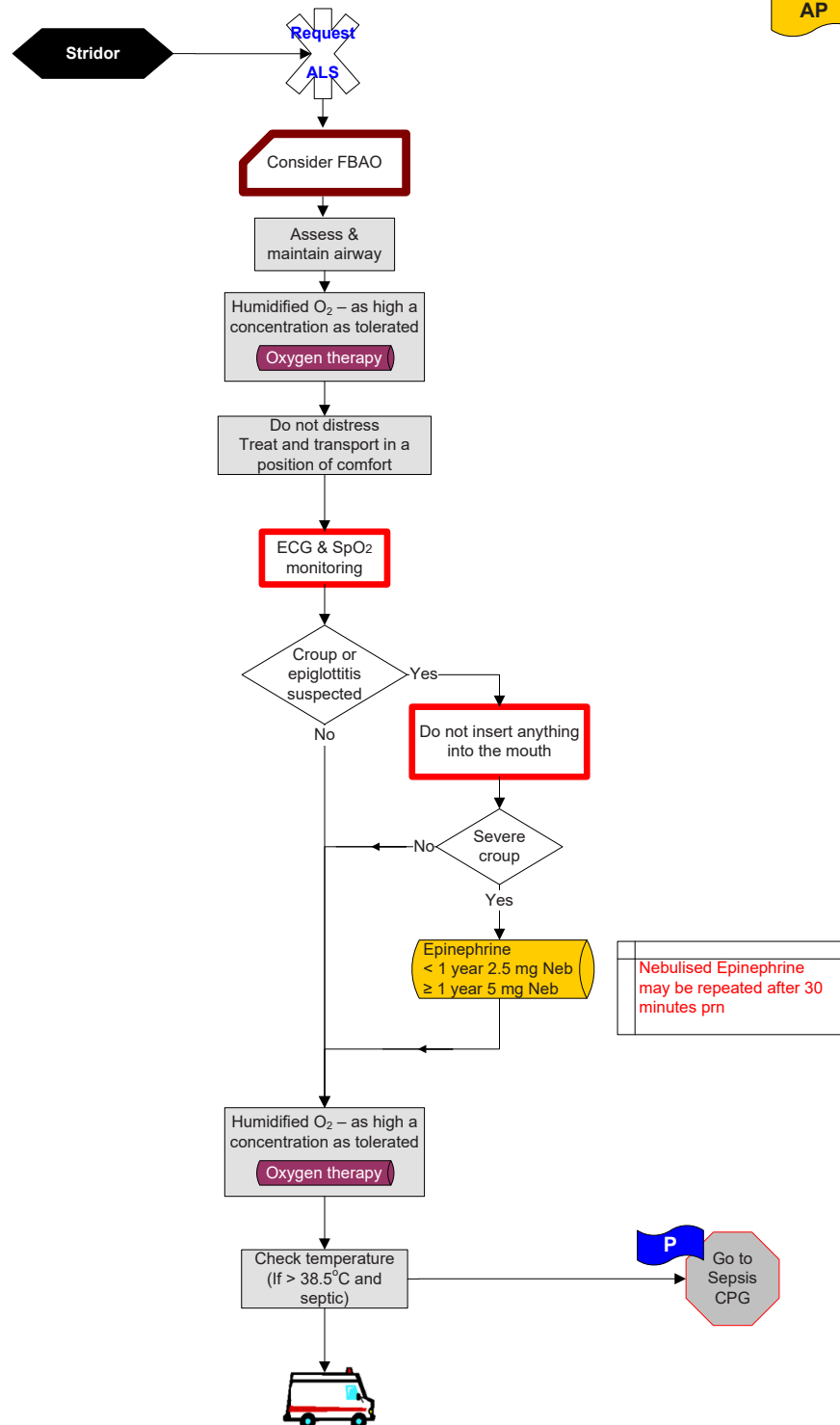
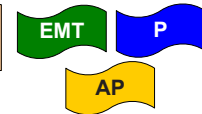


Reference: HSE National Asthma Programme 2012, Emergency Asthma Guidelines, British Thoracic Society, 2008, British Guidelines on the Management of Asthma, a national clinical guideline

## SECTION 7 - Paediatric Emergencies

4/5/6.7.13  
Version 4, 11/2016

### Stridor – Paediatric (≤ 15 years)



Reference: BNF for children 2015 - 2016

National Clinical Guideline No. 6: Sepsis Management, National Clinical Effectiveness Committee, Department of Health, November, 2014



## SECTION 7 – Paediatric Emergencies

4/5/6.7.20  
Version 3, 03/2016

### Basic Life Support – Paediatric (≤ 15 Years)



Initiate mobilisation of 3 to 4 practitioners / responders

**Cardiac arrest or pulse < 60 per minute with signs of poor perfusion**

Give 5 rescue ventilations

Oxygen therapy

Request

ALS

Commence chest **Compressions**  
Continue CPR (30:2) until defibrillator is attached

< 8 years

Yes

No

Apply paediatric system AED pads

Apply adult defibrillation pads

Assess Rhythm

**Shockable**  
VF or pulseless VT  
(4 J/Kg)

**Non - Shockable**  
Asystole or PEA

Give 1 shock

Immediately resume CPR x 2 minutes

Rhythm check \*

Go to VF / Pulseless VT CPG

VF/ VT

ROSC

Go to Post Resuscitation Care CPG

Asystole / PEA

Go to Asystole / PEA CPG

< 8 years use paediatric defibrillation system (if not available use adult pads)

**One rescuer CPR 30:2**  
**Two rescuer CPR 15:2**  
(≥ 12 years two rescuer CPR 30:2)  
Compressions : Ventilations

Chest compressions  
Rate: 100 to 120/min  
Depth: 1/3 depth of chest  
Child : two hands (5 cm)  
Small child; one hand (4 cm)  
Infant (< 1); two fingers (4 cm)

With two rescuer CPR use two thumb-encircling hand chest compression for infants

AP Change defibrillator to manual mode

P Consider changing defibrillator to manual mode

\* +/- Pulse check: pulse check after 2 minutes of CPR if potentially perfusing rhythm

Reference: ILCOR Guidelines 2015

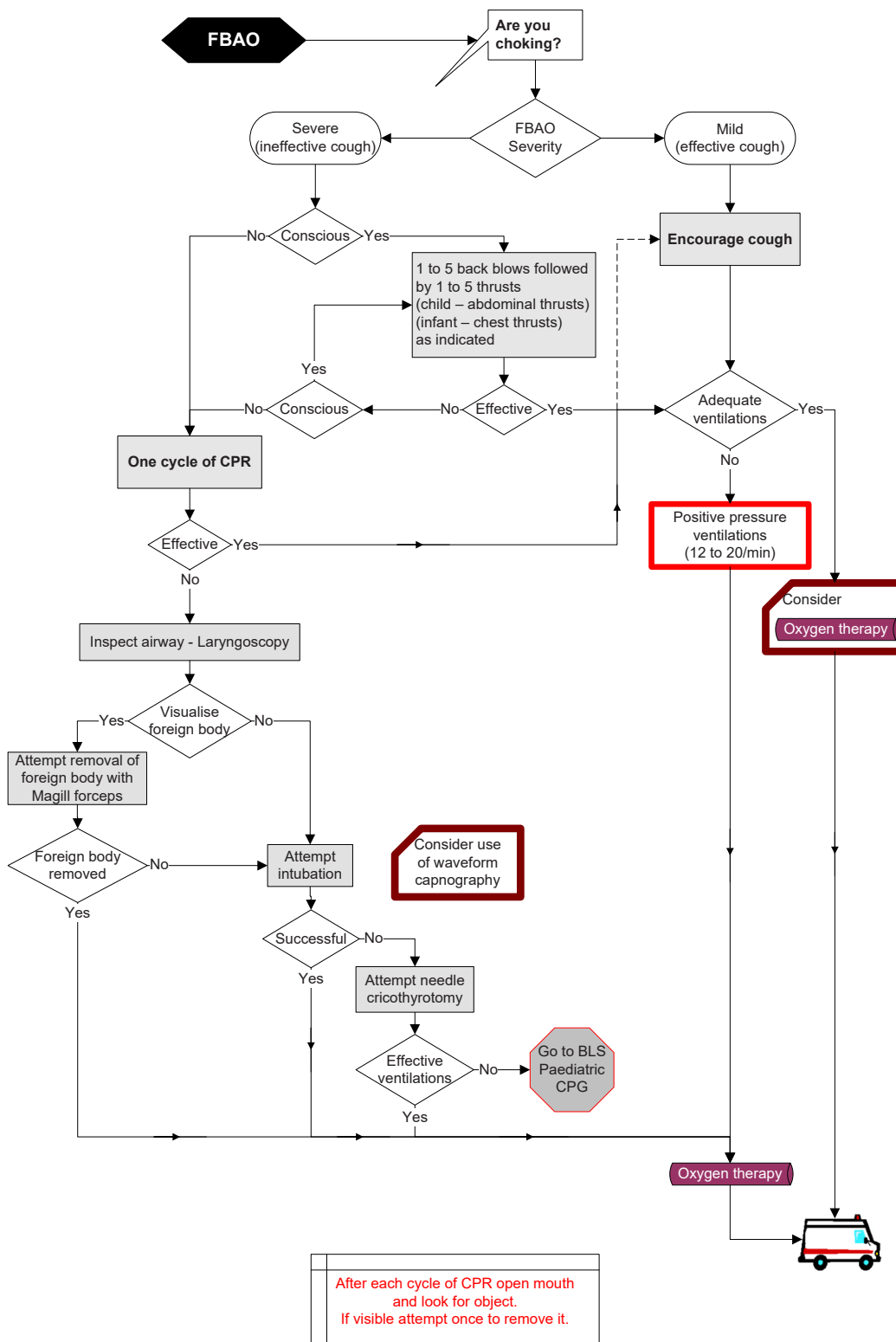
**Infant AED**  
It is extremely unlikely to ever have to defibrillate a child less than 1 year old. Nevertheless, if this were to occur the approach would be the same as for a child over the age of 1. The only likely difference being, the need to place the defibrillation pads anterior (front) and posterior (back), because of the infant's small size.

## SECTION 7 - Paediatric Emergencies

**6.7.21**  
Version 3, 03/2016

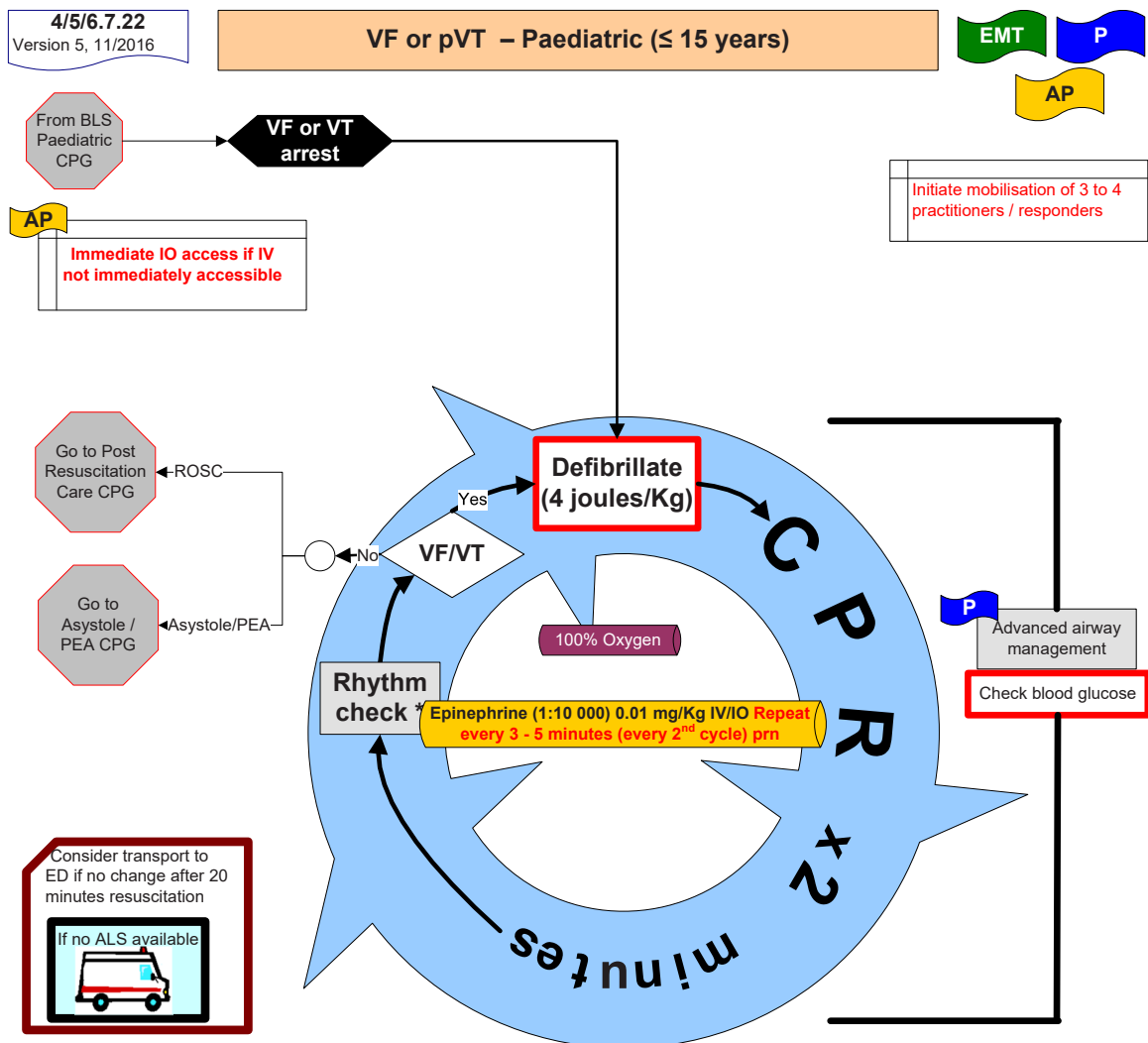
### Foreign Body Airway Obstruction – Paediatric (≤ 15 years)

AP



Reference:  
ILCOR Guidelines 2015

## SECTION 7 - Paediatric Emergencies



**Defibrillation:**  
< 8 years use paediatric defibrillation system (if not available use adult pads)

If refractory VF/pVT post Epinephrine and 3<sup>rd</sup> shock

**Amiodarone 5 mg/Kg IV/IO**

**Special Authorisation:**  
Advanced Paramedics are authorised to substitute Amiodarone with a one off bolus of Lidocaine (1-1.5 mg/Kg IV) if Amiodarone is not available

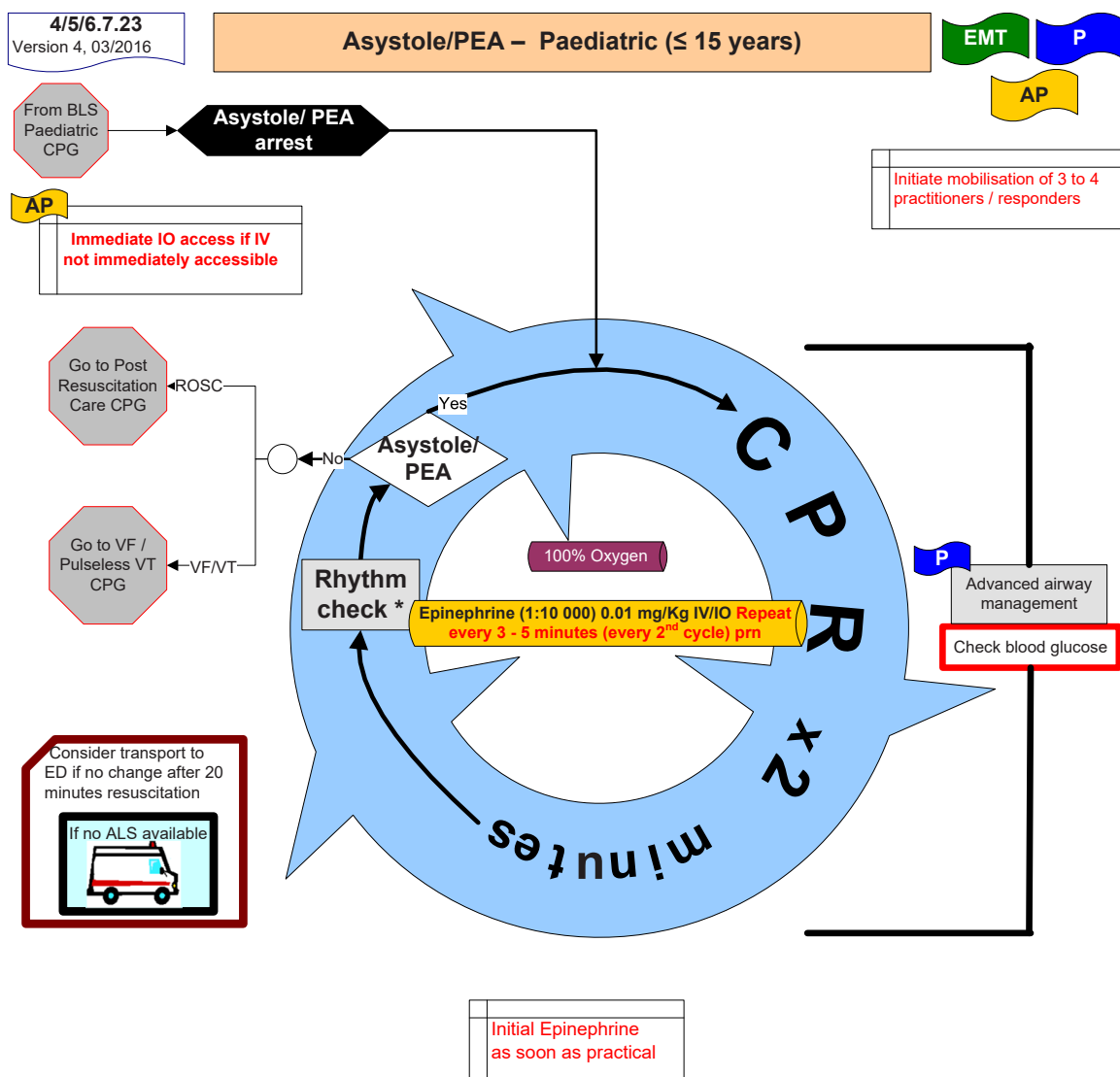
**Consider causes and treat as appropriate:**

- Hydrogen ion acidosis
- Hyper/ hypokalaemia
- Hypothermia
- Hypovolaemia
- Hypoxia
- Thrombosis – pulmonary
- Tension pneumothorax
- Thrombus – coronary
- Tamponade – cardiac
- Toxins
- Trauma

\* +/- Pulse check: pulse check after 2 minutes of CPR if potentially perfusing rhythm

Reference: ILCOR Guidelines 2015

## SECTION 7 - Paediatric Emergencies



**Consider causes and treat as appropriate:**

- Hydrogen ion acidosis
- Hyper/ hypokalaemia
- Hypothermia
- Hypovolaemia
- Hypoxia
- Thrombosis – pulmonary
- Tension pneumothorax
- Thrombus – coronary
- Tamponade – cardiac
- Toxins
- Trauma

**Consider fluid challenge**

**NaCl (0.9%) 20 mL/Kg IV/IO**

\* +/- Pulse check: pulse check after 2 minutes of CPR if potentially perfusing rhythm

Reference: ILCOR Guidelines 2015

## SECTION 7 – Paediatric Emergencies

4/5/6.7.24  
Version 4, 03/2016

### Symptomatic Bradycardia – Paediatric ( $\leq 15$ years)

EMT P

AP

AP

Immediate IO access if IV  
not immediately accessible

Initiate mobilisation of 3 to 4  
practitioners / responders

**Collective signs of inadequate perfusion**  
Tachypnoea  
Diminished/absent peripheral pulses  
Delayed capillary refill  
Cool extremities, mottling  
Unresponsive

Check blood glucose

**Symptomatic  
Bradycardia**

Oxygen therapy

Hypoxia

Consider positive  
pressure ventilations  
(12 to 20/min)

Request  
ALS

Unresponsive  
Signs of Inadequate  
perfusion &  
HR < 60

Yes

CPR

ECG & SpO<sub>2</sub>  
monitoring

NaCl (0.9%) 20 mL/Kg IV/IO

Reassess

Epinephrine (1:10 000) 0.01 mg/Kg IV/IO  
Repeat every 3 - 5 minutes (every 2<sup>nd</sup> cycle) prn

Persistent  
bradycardia

Yes

Continue  
CPR

If no ALS available

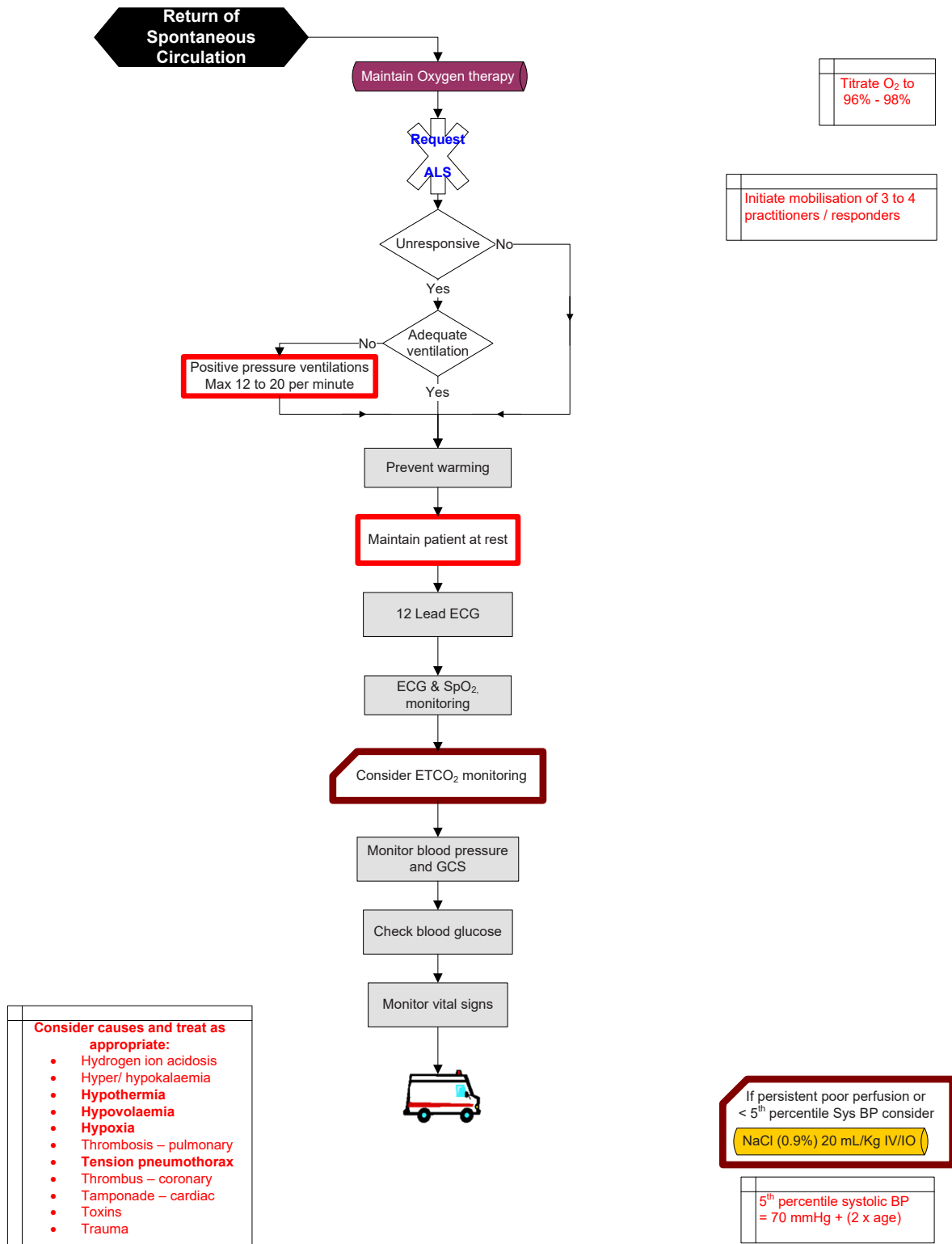
Reference: ILCOR Guidelines 2015

## SECTION 7 – Paediatric Emergencies

5/6.7.25  
Version 3, 03/2016

### Post-Resuscitation Care – Paediatric ( $\leq 15$ years)

P AP



Reference: ILCOR Guidelines 2015

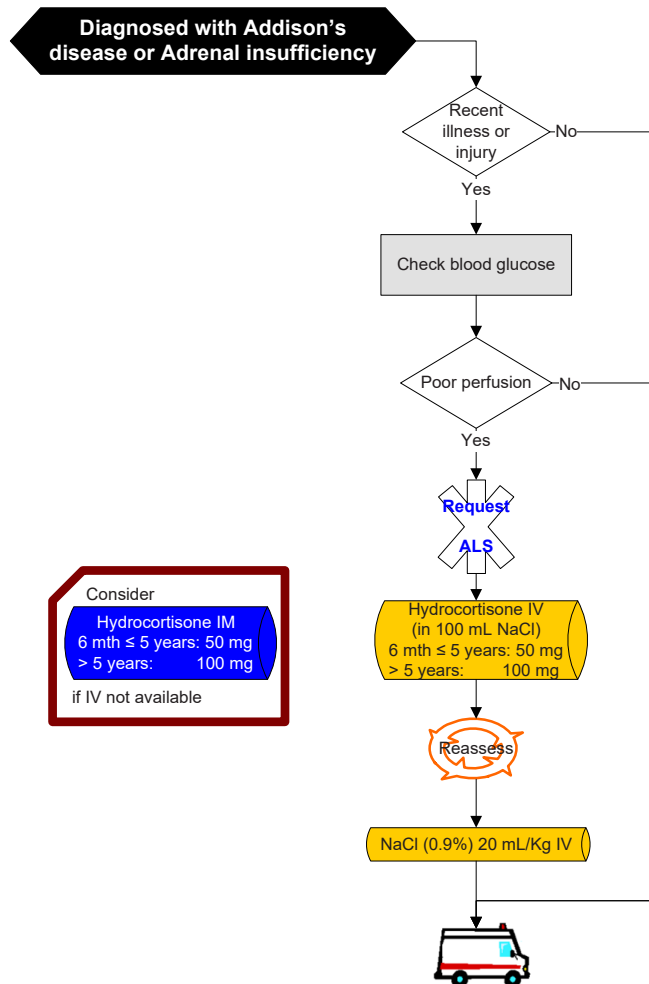
## SECTION 7 – Paediatric Emergencies

5/6.7.30  
Version 1, 12/2013

### Adrenal Insufficiency – Paediatric ( $\leq 15$ years)

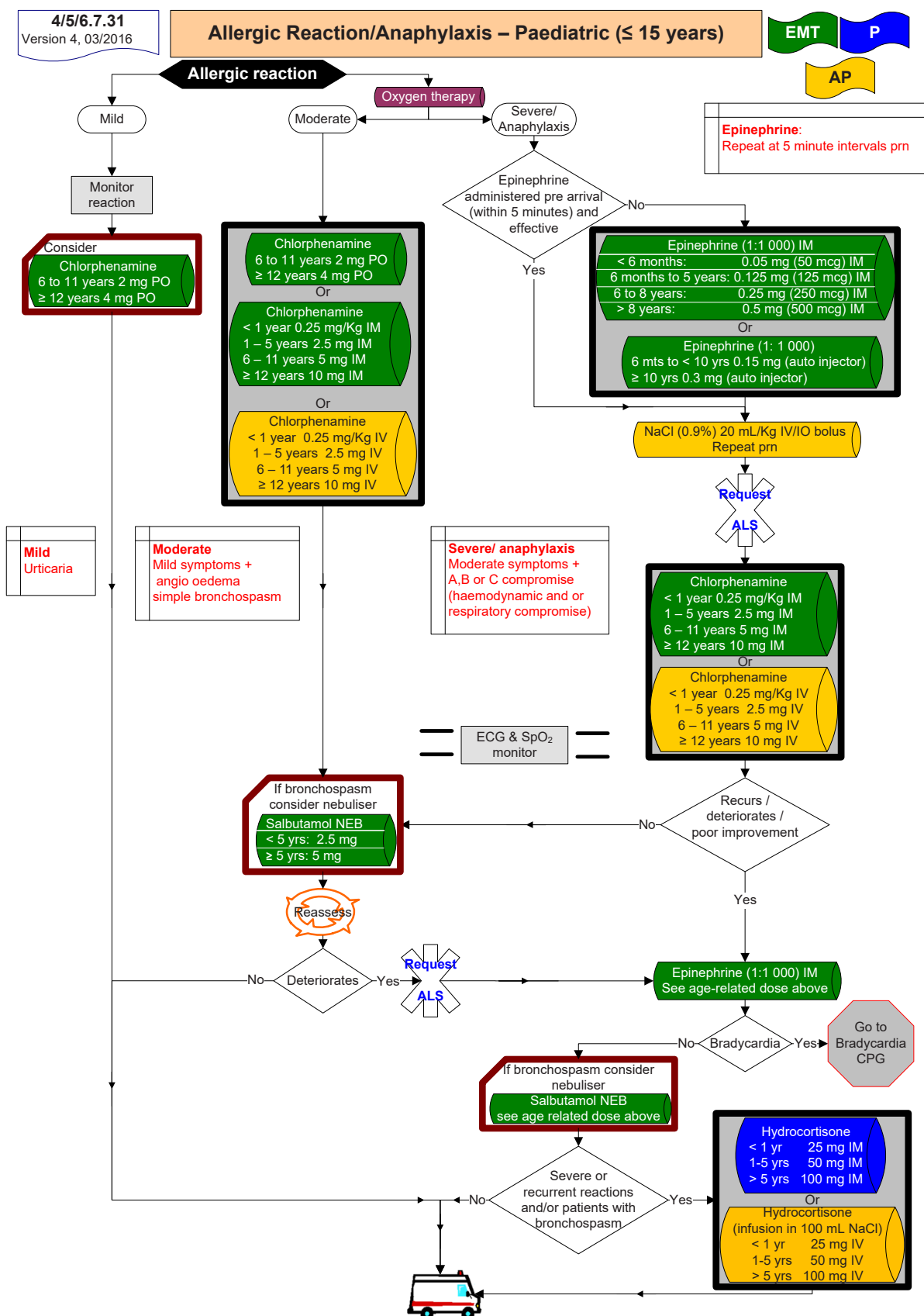
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AP



Reference: Antal, Z. and P. Zhou (2009). "Addison disease." *Pediatr Rev* 30(12): 491-493

## SECTION 7 - Paediatric Emergencies



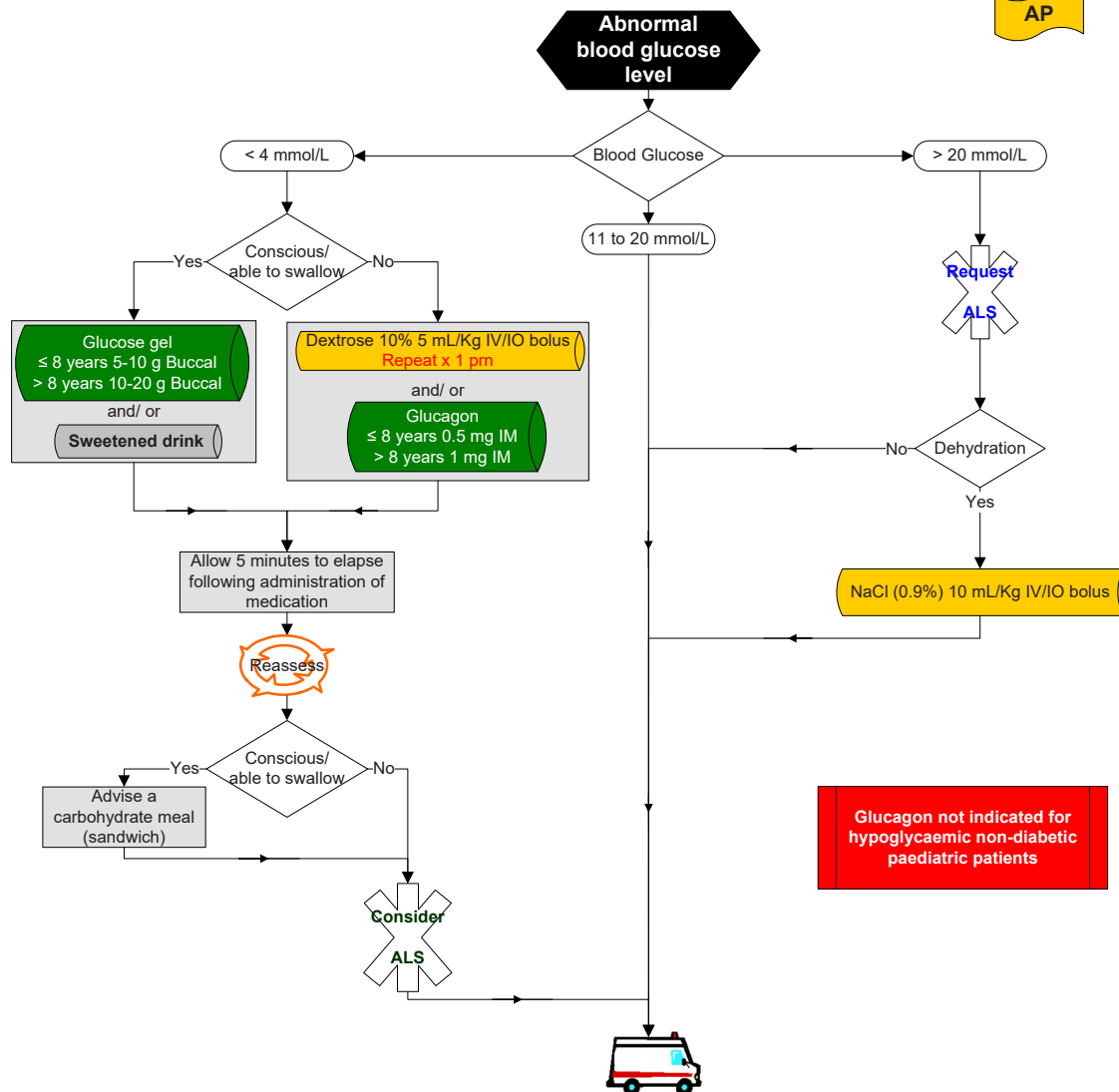
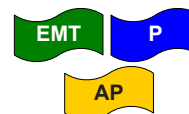
Reference: Royal College of Physicians of Ireland, 2014, National Immunisation Advisory Committee, Anaphylactic Reactions: Treatment Algorithm for First Medical Responders.



## SECTION 7 - Paediatric Emergencies

4/5/6.7.32  
Version 4, 04/2016

### Glycaemic Emergency – Paediatric (≤ 15 years)



Reference: Dehydration- Paramedic Textbook 2<sup>nd</sup> E p 1229

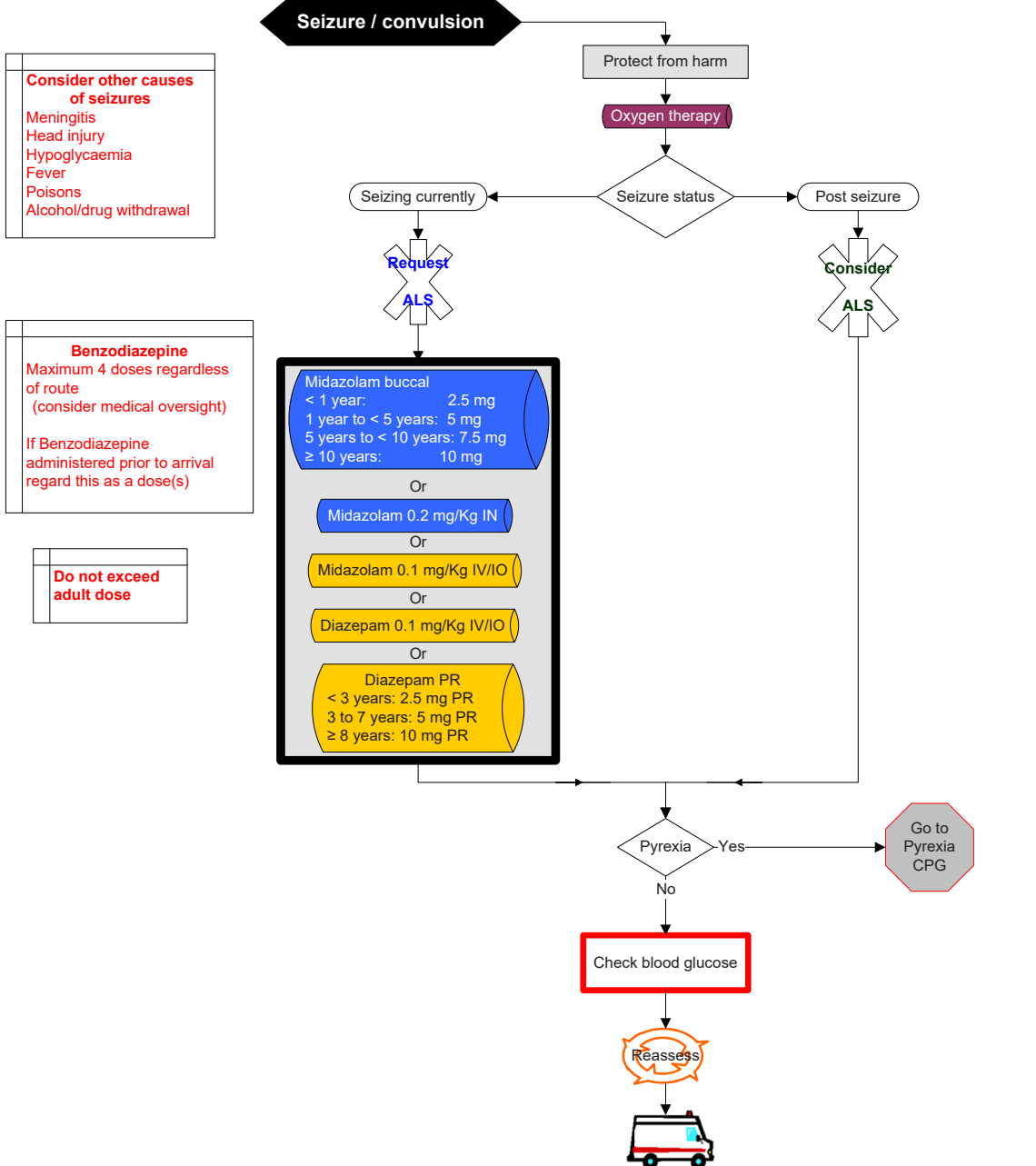
## SECTION 7 - Paediatric Emergencies

5/6.7.33  
Version 5, 11/2016

### Seizure/Convulsion – Paediatric (≤ 15 years)

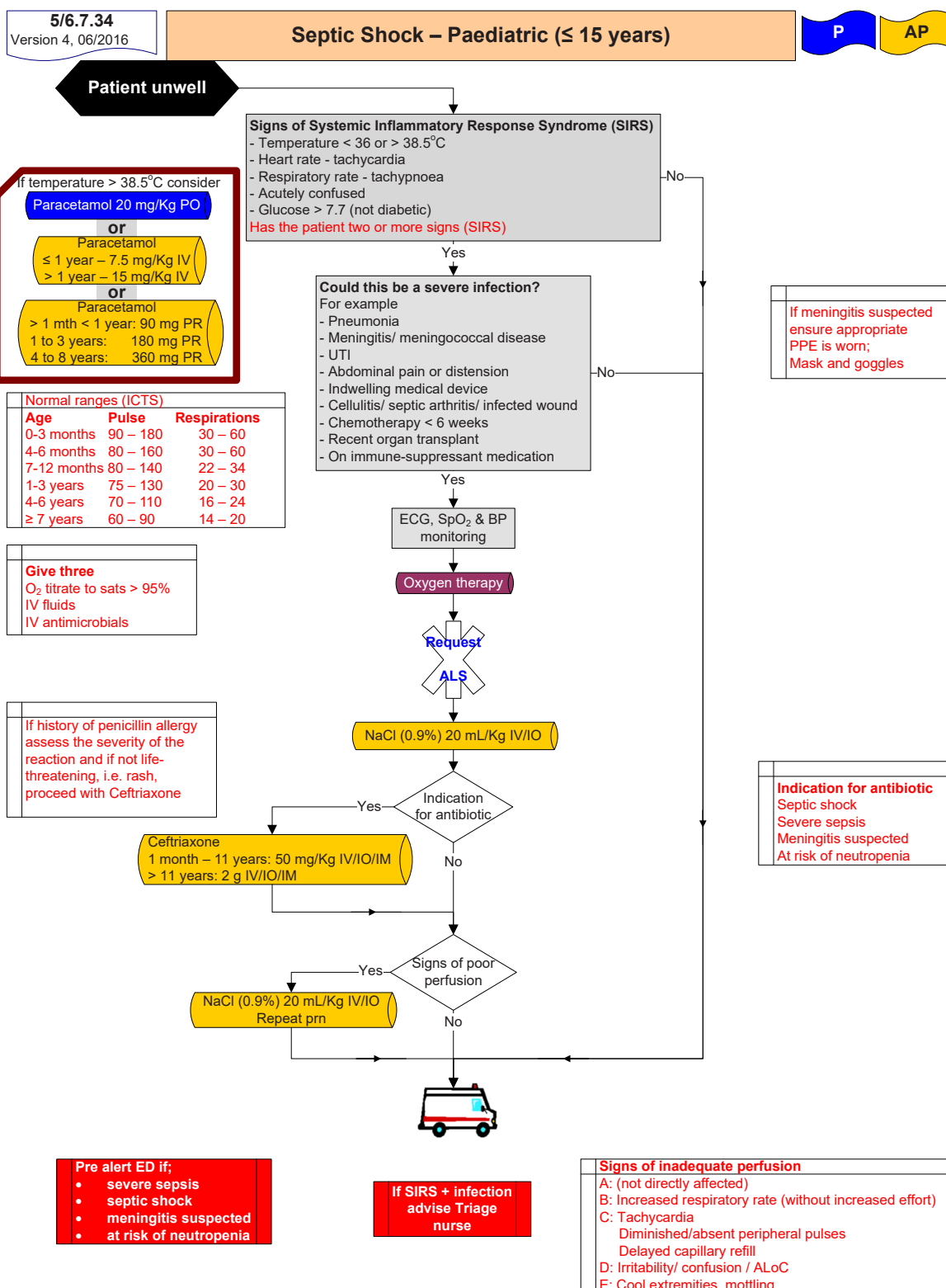
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AP



Reference: Appleton, R., et al. (2008). "Drug management for acute tonic-clonic convulsions including convulsive status epilepticus in children." Cochrane Database Syst Rev(3): CD001905

## SECTION 7 – Paediatric Emergencies

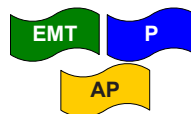


Reference: National Clinical Guideline No. 12: The Irish Paediatric Early Warning System (PEWS), National Clinical Effectiveness Committee, Department of Health, November, 2015  
RFDS, 2013, Primary Clinical Care Manual 8<sup>th</sup> Edition

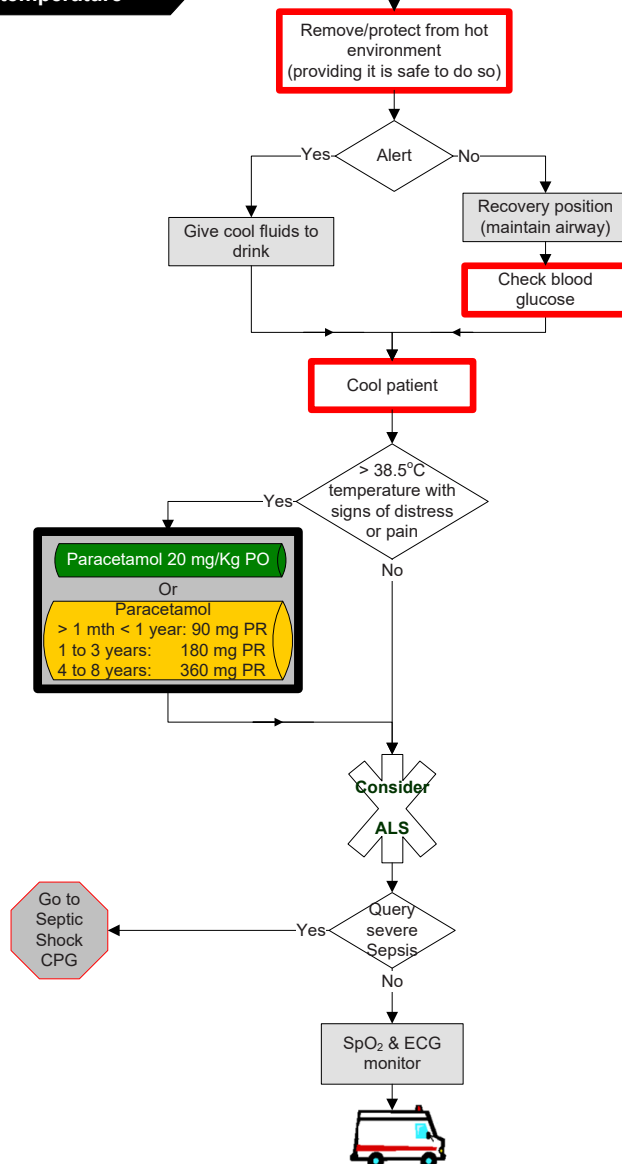
## SECTION 7 - Paediatric Emergencies

4/5/6.7.35  
Version 2, 03/2016

### Pyrexia – Paediatric ( $\leq 15$ years)

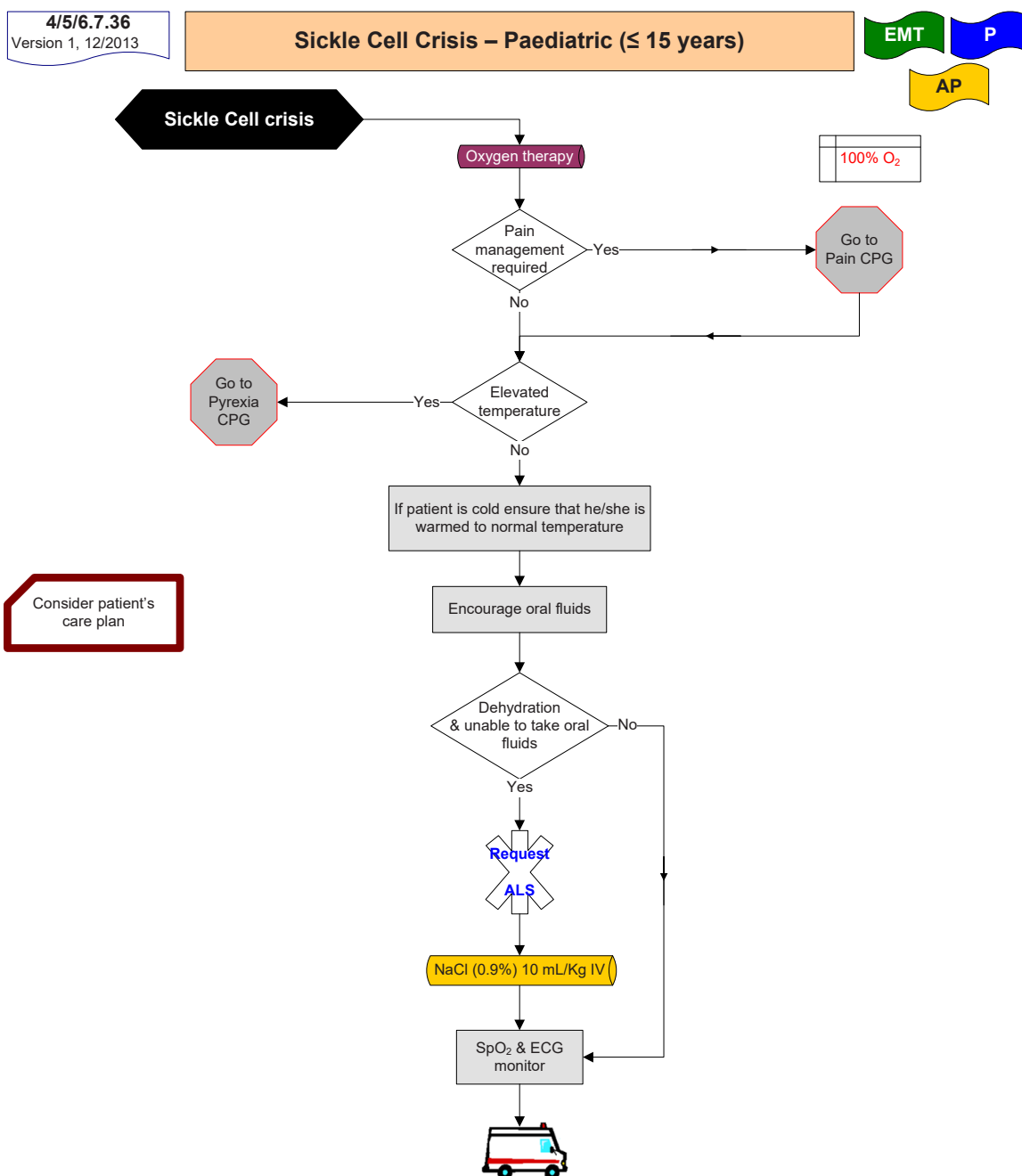


Child with elevated temperature



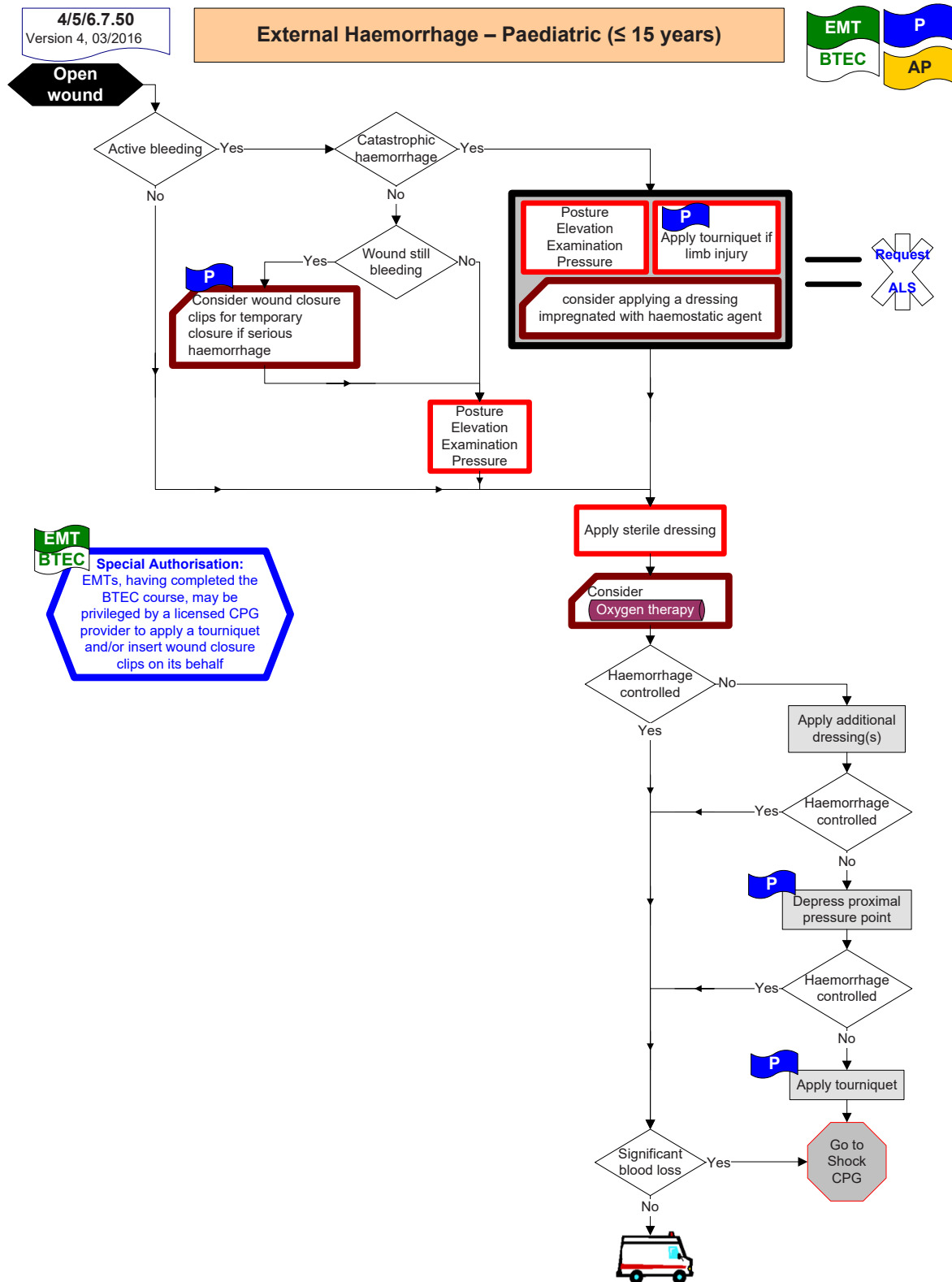
Reference: ILCOR Guidelines 2015  
RFDS, 2013, Primary Clinical Care Manual 8<sup>th</sup> Edition

## SECTION 7 – Paediatric Emergencies



Reference: Rees, D, 2003, GUIDELINES FOR THE MANAGEMENT OF THE ACUTE PAINFUL CRISIS IN SICKLE CELL DISEASE; British Journal of Haematology, 2003, 120, 744–752

## SECTION 7 - Paediatric Emergencies



Reference: ILCOR Guidelines 2015

Granville-Chapman J, et al. Pre-hospital haemostatic dressings: A systematic review. Injury (2010), doi: 10.1016/j.injury.2010.09.037

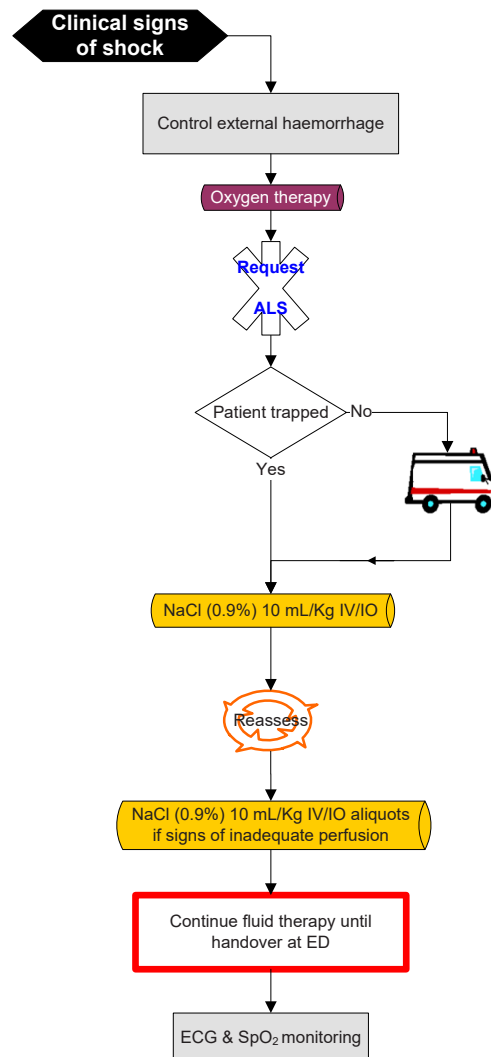
## SECTION 7 – Paediatric Emergencies

5/6.7.51  
Version 3, 12/2013

### Shock from Blood Loss – Paediatric ( $\leq 15$ years)

P

AP

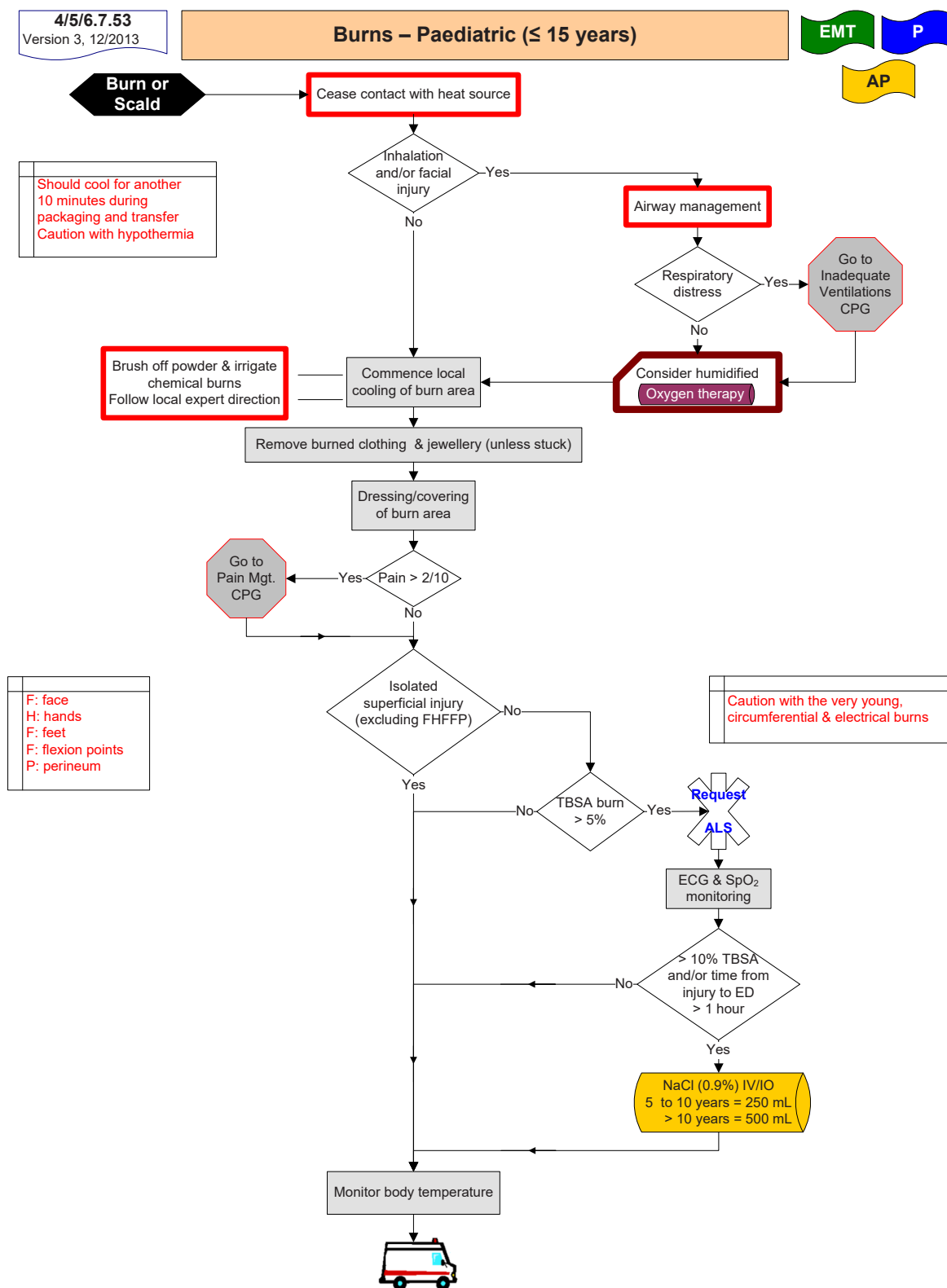


#### Signs of inadequate perfusion

- A: (not directly affected)
- B: Increased respiratory rate (without increased effort)
- C: Tachycardia
  - Diminished/absent peripheral pulses
  - Delayed capillary refill
- D: Irritability/ confusion / ALoC
- E: Cool extremities, mottling

Reference: American Academy of Pediatrics, 2000, Pediatric Education for Prehospital Professionals, Jones and Bartlett.

## SECTION 7 - Paediatric Emergencies



Reference: Allison, K et al, 2004, Consensus on the prehospital approach to burns patient management, Emerg Med J 2004; 21:112-114  
Sanders, M, 2001, Paramedic Textbook 2<sup>nd</sup> Edition, Mosby



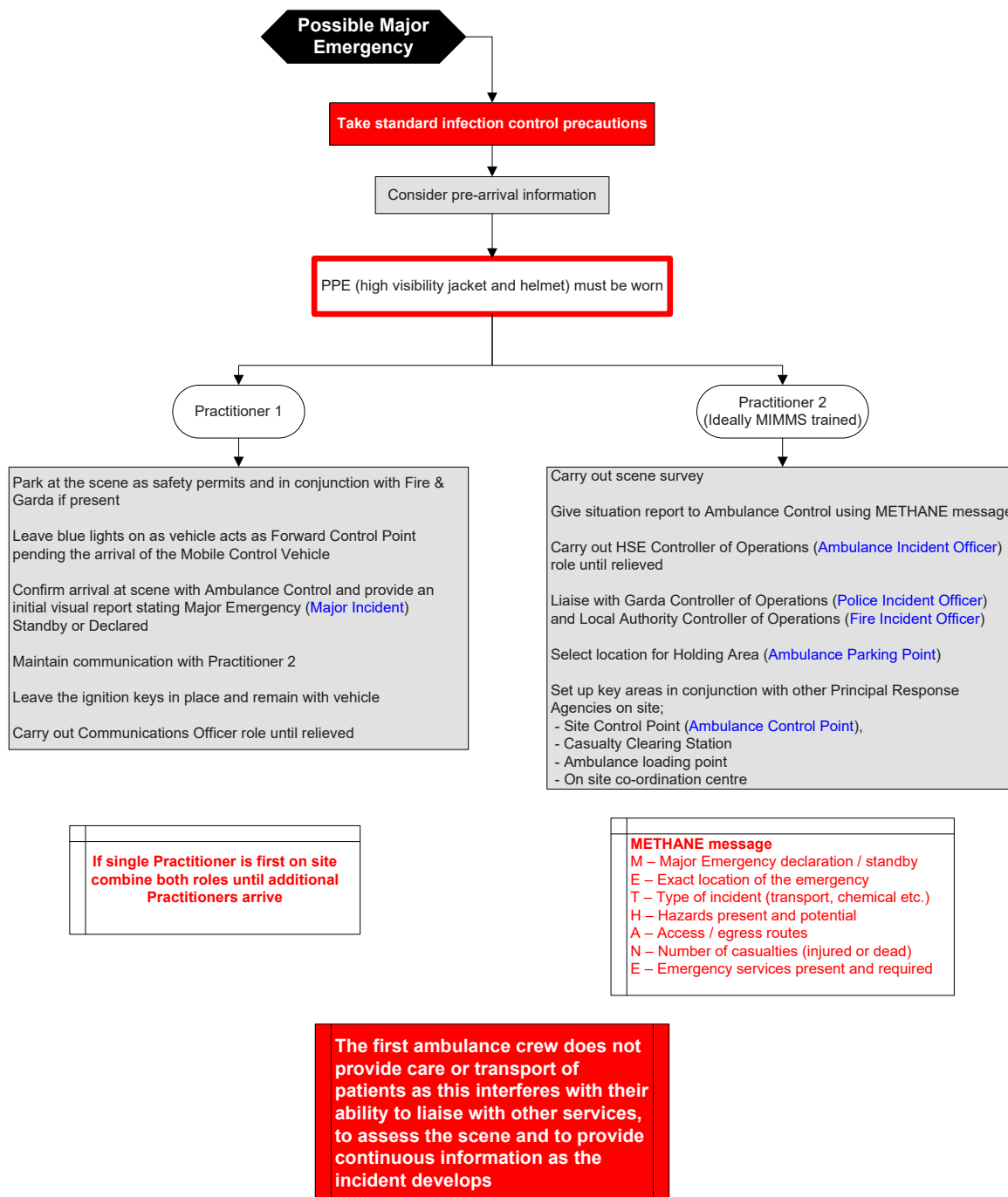
## SECTION 8 - Pre-Hospital Emergency Care Operations

**4/5/6.8.1**  
Version 2, 01/2013

### Major Emergency (Major Incident) – First Practitioners on site



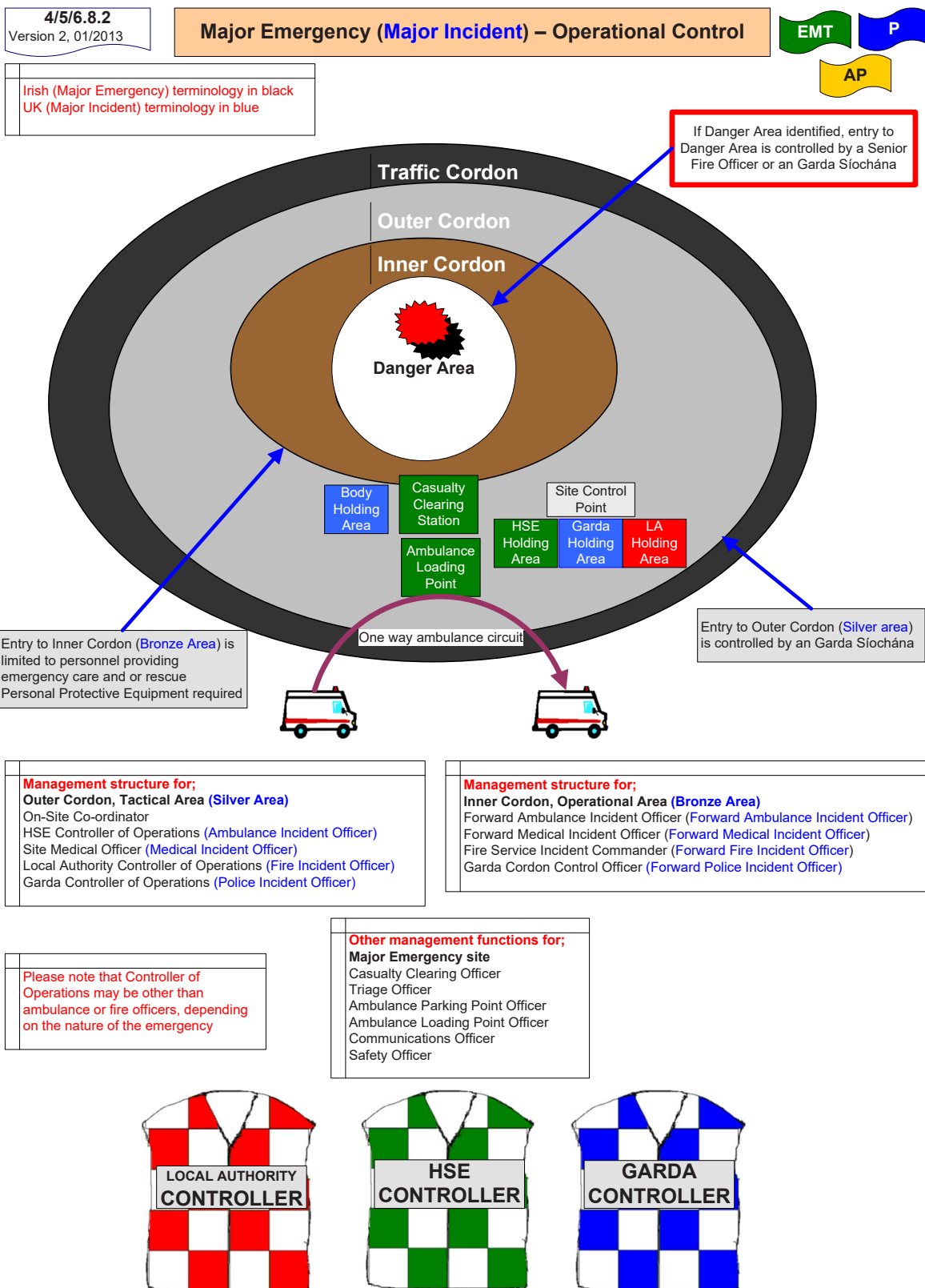
Irish (Major Emergency) terminology in black  
UK (Major Incident) terminology in blue



The principles and terminology of Major Incident Medical Management and Support (MIMMS) has been used with the kind permission of the Advanced Life Support Group, UK

Reference: A Framework for Major Emergency Management, 2006, Inter-Departmental Committee on Major Emergencies (Replaced by National Steering Group on Major Emergency Management)

## SECTION 8 - Pre-Hospital Emergency Care Operations



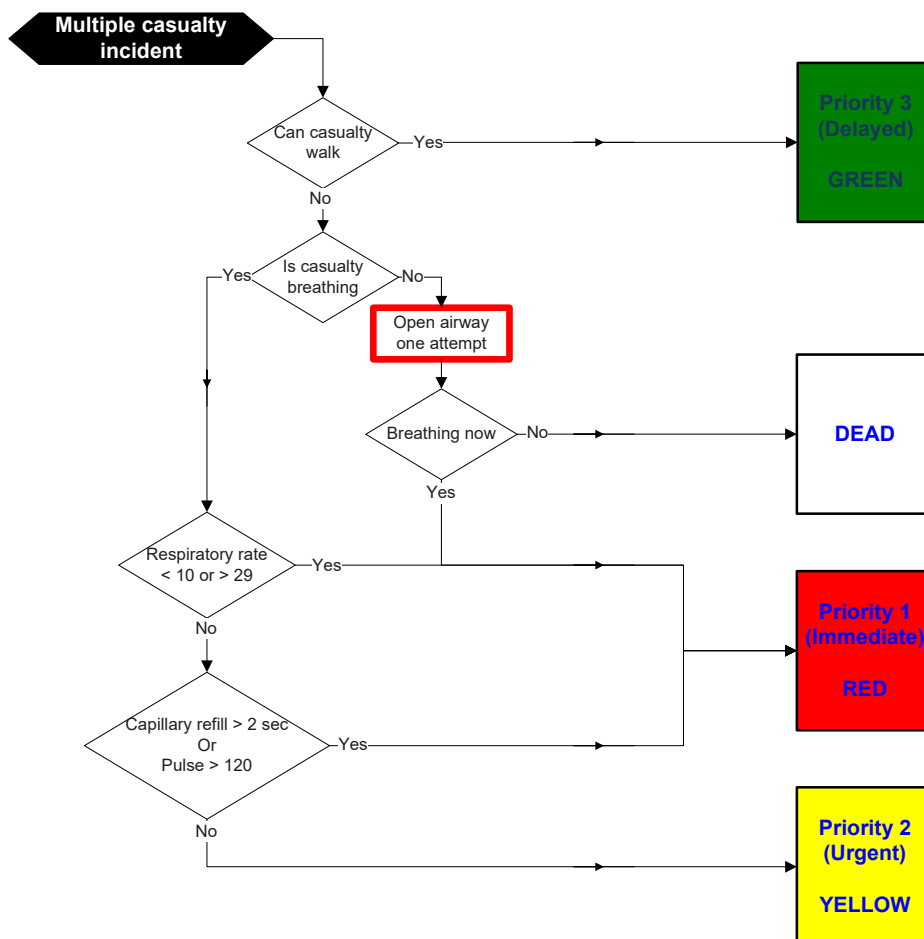
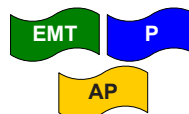
The principles and terminology of Major Incident Medical Management and Support (MIMMS) has been used with the kind permission of the Advanced Life Support Group, UK

Reference: A Framework for Major Emergency Management, 2006, Inter-Departmental Committee on Major Emergencies (Replaced by National Steering Group on Major Emergency Management)

## SECTION 8 - Pre-Hospital Emergency Care Operations

4/5/6.8.3  
Version 1, 05/2008

### Triage Sieve



**Triage is a  
dynamic  
process**

The principles and terminology of Major Incident Medical Management and Support (MIMMS) has been used with the kind permission of the Advanced Life Support Group, UK

## SECTION 8 - Pre-Hospital Emergency Care Operations

**5/6.8.4**  
Version 1, 05/2008

### Triage Sort

P

AP

**Multiple casualty incident**

Cardiopulmonary function	Measured value	Score	Insert score
Respiratory Rate	10 – 29 / min	4	A
	> 29 / min	3	
	6 – 9 / min	2	
	1 – 5 / min	1	
	None	0	
Systolic Blood Pressure	≥ 90 mm Hg	4	B
	76 – 89 mm Hg	3	
	50 – 75 mm Hg	2	
	1 – 49 mm Hg	1	
	No BP	0	
Glasgow Coma Scale	13 – 15	4	C
	9 – 12	3	
	6 – 8	2	
	4 – 5	1	
	3	0	
<b>Triage Revised Trauma Score</b>			<b>A+B+C</b>

Triage is a dynamic process

**Revised Trauma Score**

1 - 10

**Priority 1 (Immediate)**  
**RED**

11

**Priority 2 (Urgent)**  
**YELLOW**

12

**Priority 3 (Delayed)**  
**GREEN**

0

**DEAD**

Eye Opening	Spontaneous	4
	To Voice	3
	To Pain	2
	None	1
Verbal Response	Oriented	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
Motor Response	None	1
	Obeys commands	6
	Localises pain	5
	Withdraw (pain)	4
	Flexion (pain)	3
Glasgow Coma Scale	Extension (pain)	2
	None	1

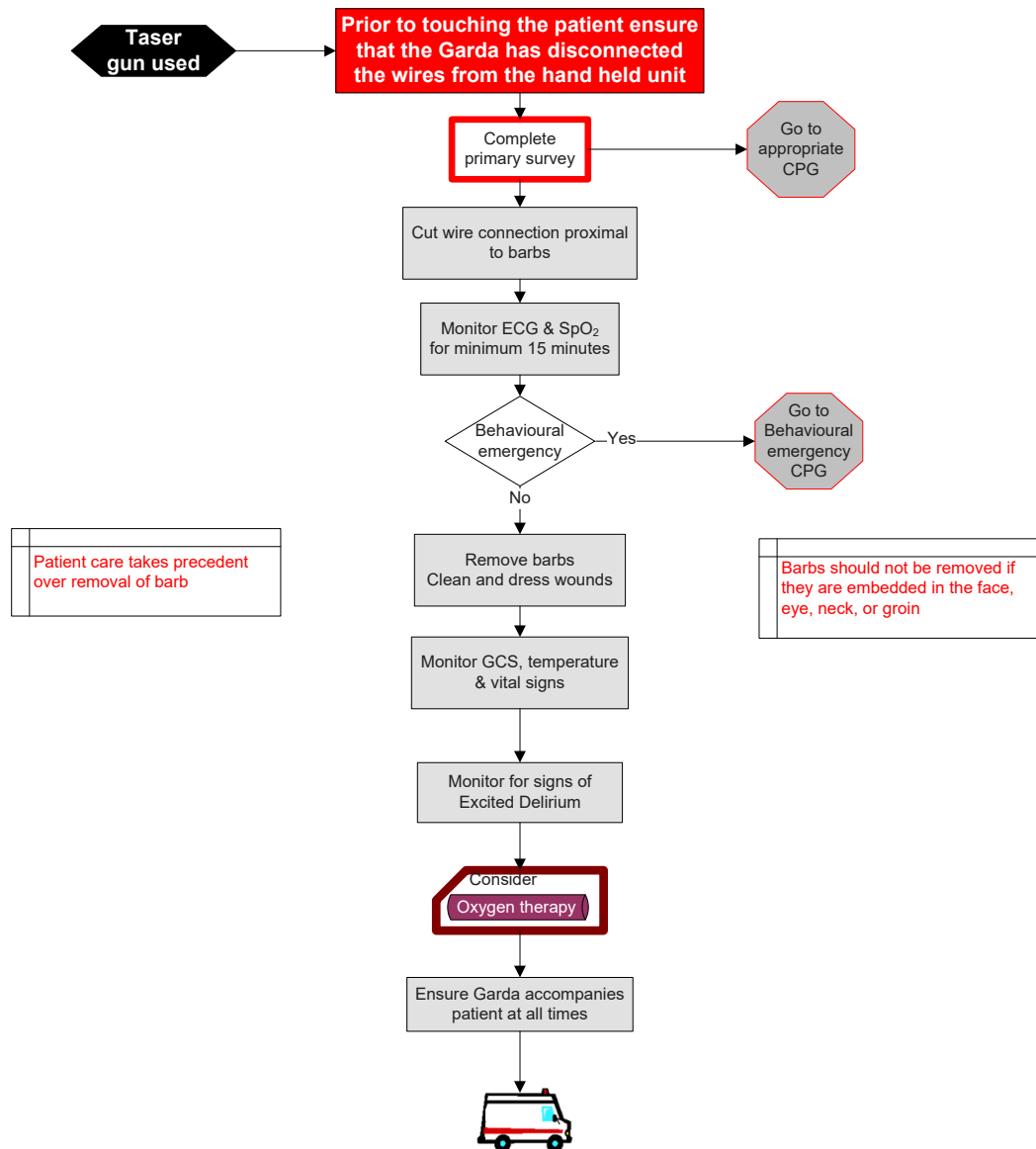
The principles and terminology of Major Incident Medical Management and Support (MIMMS) has been used with the kind permission of the Advanced Life Support Group, UK

## SECTION 8 - Pre-Hospital Emergency Care Operations

**5/6.8.5**  
Version 1, 05/2008

### Conducted Electrical Weapon (Taser)

**P** **AP**



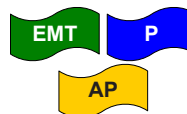
**Note:**  
This CPG was developed in conjunction with the Chief Medical Officer, An Garda Síochána

Reference:  
DSAC Sub-committee on the Medical Implications of Less-lethal Weapons 2004, Second statement on the medical implications of the use of the M26 Advanced Taser.  
United States Government Accountability Office, 2005, The use of Taser by selected law enforcement agencies  
Manitoba Health Emergency Medical Services, 2007 Taser Dart Removal Protocol

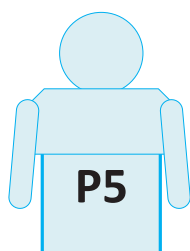
## SECTION 8 - Pre-Hospital Emergency Care Operations

**4/5/6.8.6**  
Version 1, 03/2016

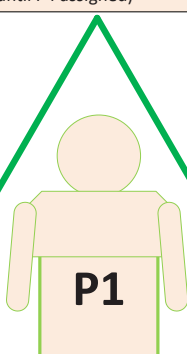
### Team Resuscitation



**Identification: P5**  
**Role: Family & Team Support**  
**Position: Outside the BLS triangle**  
1. Family Liaison  
2. Patient Hx/meds  
3. Manage Equipment  
4. Plan removal (if transporting)



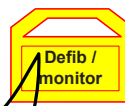
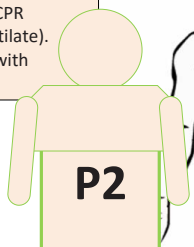
**Identification: P1**  
**Role: Airway and ventilatory support & initial team leader**  
**Location: Inside BLS Triangle at patient's head**  
**Tasks:**  
1. Position defibrillator/monitor.  
2. Attach defib pads and operate defibrillator/monitor (If awaiting arrival of P3)  
3. Basic airway management (manoeuvre, suction & adjunct)  
4. Assemble ventilation equipment and ventilate  
5. Insert advanced airway (unsynchronised ventilation and ETCO<sub>2</sub> monitor, if available)  
6. Team leader (until P4 assigned)



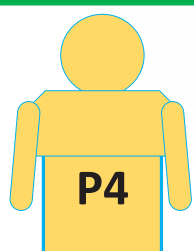
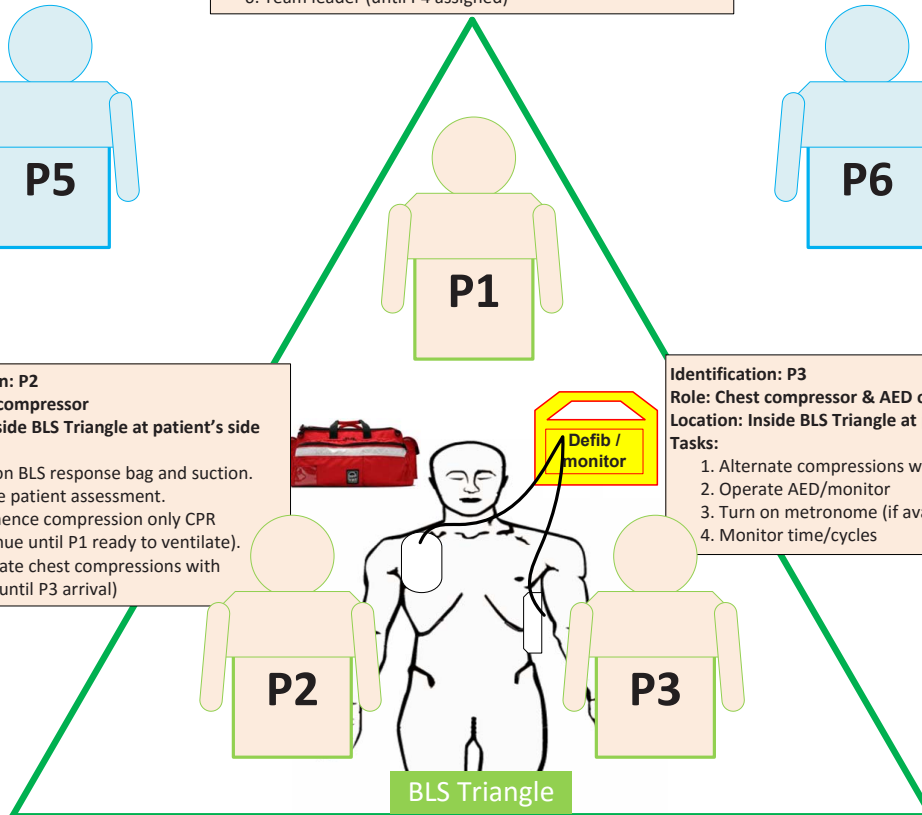
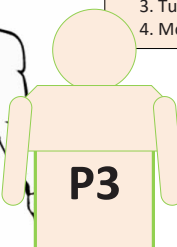
**Identification: P6**  
**Role: Team Support**  
**Location: Outside BLS Triangle**  
**Tasks:**  
1. Support P1 with airway and ventilation.  
2. Support P2/P3 with chest compressions and defibrillation  
3. Documentation  
4. Support tasks assigned by P4



**Identification: P2**  
**Role: Chest compressor**  
**Location: Inside BLS Triangle at patient's side**  
**Tasks:**  
1. Position BLS response bag and suction.  
2. Initiate patient assessment.  
3. Commence compression only CPR (continue until P1 ready to ventilate).  
4. Alternate chest compressions with P3 (P1 until P3 arrival)



**Identification: P3**  
**Role: Chest compressor & AED operator**  
**Location: Inside BLS Triangle at patient's side**  
**Tasks:**  
1. Alternate compressions with P2  
2. Operate AED/monitor  
3. Turn on metronome (if available)  
4. Monitor time/cycles



**Identification: P4**  
**Role: Cardiac Arrest Team Leader**  
**Location: Outside the BLS Triangle (ideally at the patient's feet with a clear view of the patient, team and Monitor)**  
**Tasks:**  
1. Position exchange of Team Leader  
2. Position ALS bag (AP)  
3. Take Handover from P1  
4. Monitor BLS quality.  
5. Initiate IV/IO access & administers medications (AP)  
6. Intubate if clinically warranted (AP)  
7. Communicate with family/Family Liaison.  
8. Identify and treat reversible causes (Hs + Ts)  
9. Provide clinical leadership.  
10. Conduct post event debrief.

Positions and roles are as laid out, however a practitioner may change position thus taking on the role of that position.

If ALS are first on scene they perform BLS until sufficient BLS personnel are on scene

Reference: ILCOR Guidelines 2015

## SECTION 8 - Pre-Hospital Emergency Care Operations

5/6.8.7  
Version 1, 03/2016

### Palliative Care – Adult

P

AP

**Patient with a known advanced progressive and life-limiting illness who is currently receiving palliative care services at home**

Consider administration of prescribed medication(s) as required

Symptoms causing distress

Go to End of life CPG

Symptom control directive and medications available

Consider  
ALS

Use lowest effective dose for all medications

Fever/Pyrexia

Pain

Dyspnoea

Nausea/vomiting

Anxiety

Agitation/delirium

Oropharyngeal secretions

Consider

Paracetamol 1 g PO

Consider

Morphine 2.5 - 5 mg SC

Consider

Midazolam 2.5 mg SC

Consider

Glycopyrronium Bromide 0.4 mg SC

Or

Hyoscine Butylbromide 10 - 20 mg SC

Consider

Morphine 2.5 - 5 mg SC

Consider

Cyclizine 50 mg SC

Or

Haloperidol 1 - 2 mg SC

Consider \*

Haloperidol 1 - 2 mg SC

+ / -

Midazolam 2.5 mg SC

Follow GP's patient directive

\* Administer Haloperidol for Agitation/delirium, consider Midazolam in addition only if severe agitation.

Record medications administered on PCR and patient record in the home

Monitor medication(s) effect for 10 minutes

Consider mouth care (sips from spoon and moisten lips)

Symptoms eased

No

Consider repeating medication(s) x one prn

Symptoms eased

No

Consider

Go to End of life CPG

Or

Consider

#### Alternative medication routes

Morphine 5 - 10 mg PO

Midazolam 2.5 - 5 mg Buccal

Haloperidol 1 - 2 mg PO

Cyclizine 50 mg PO

Contact Home Care Team or GP Co-op and report on episode

Monitor the patient for at least 20 minutes

For Catherine Laville

Reference: STN023 Palliative Care by PHECC registered practitioners

## SECTION 8 - Pre-Hospital Emergency Care Operations

5/6.8.8  
Version 1, 06/2016

### Verification of Death

P

AP

An unexpected death has occurred  
An expected death has occurred  
Cease resuscitation has occurred  
An obvious dead body has been found

Verification of death	
<b>CIRCULATORY</b>	No pulse present No heart sounds Asystole on ECG
<b>RESPIRATORY</b>	No respiratory effort No chest sounds
<b>CEREBRAL</b>	Pupils not responding to light No reaction to painful stimuli

Verify death using  
criteria outlined

Inform Ambulance Control

Ambulance Control to inform  
An Garda Síochána of death

Record death in patient records  
(PCR or ACR)

Complete Verification of  
Death Record Form

Provide initial support to  
family/carers

Follow local protocol in  
relation to remains

Suspicious death,  
body in public place or  
body unaccompanied by  
responsible adult

Yes

No

Await arrival of  
An Garda Síochána

Response to  
Life threatening call  
required

No

Respond to life threatening  
call as soon as practical

Exit from the scene as soon as practical  
Or  
Respond to life threatening call immediately

An Garda Síochána  
on scene

No

Yes

Ambulance Control to inform  
An Garda Síochána of departure  
of crew from scene

Follow deployment  
instructions from  
Ambulance Control

It is the responsibility of An Garda  
Síochána to organise a registered medical  
practitioner to attend the scene.

An **expected death**: a case where  
discussions have taken place between  
the medical/nursing team and the  
patient's relatives and/or the patient and a  
decision has been made and documented  
that no further intervention is appropriate.

It is not uncommon for there to be  
occasional spontaneous gasping sounds  
or occasional intermittent audible heart  
sounds soon after an expected death and  
if this is the case the patient should be left  
for 15 minutes and the full procedure  
repeated.

A legible, signed entry must be made in  
the patients record (PCR / ACR) indicating  
the time and date that death was verified.  
Additionally the Verification of Death  
Record Form (VDRF) must be completed  
and kept with the patient record.  
The top copy of the VDRF must be made  
available for An Garda Síochána.

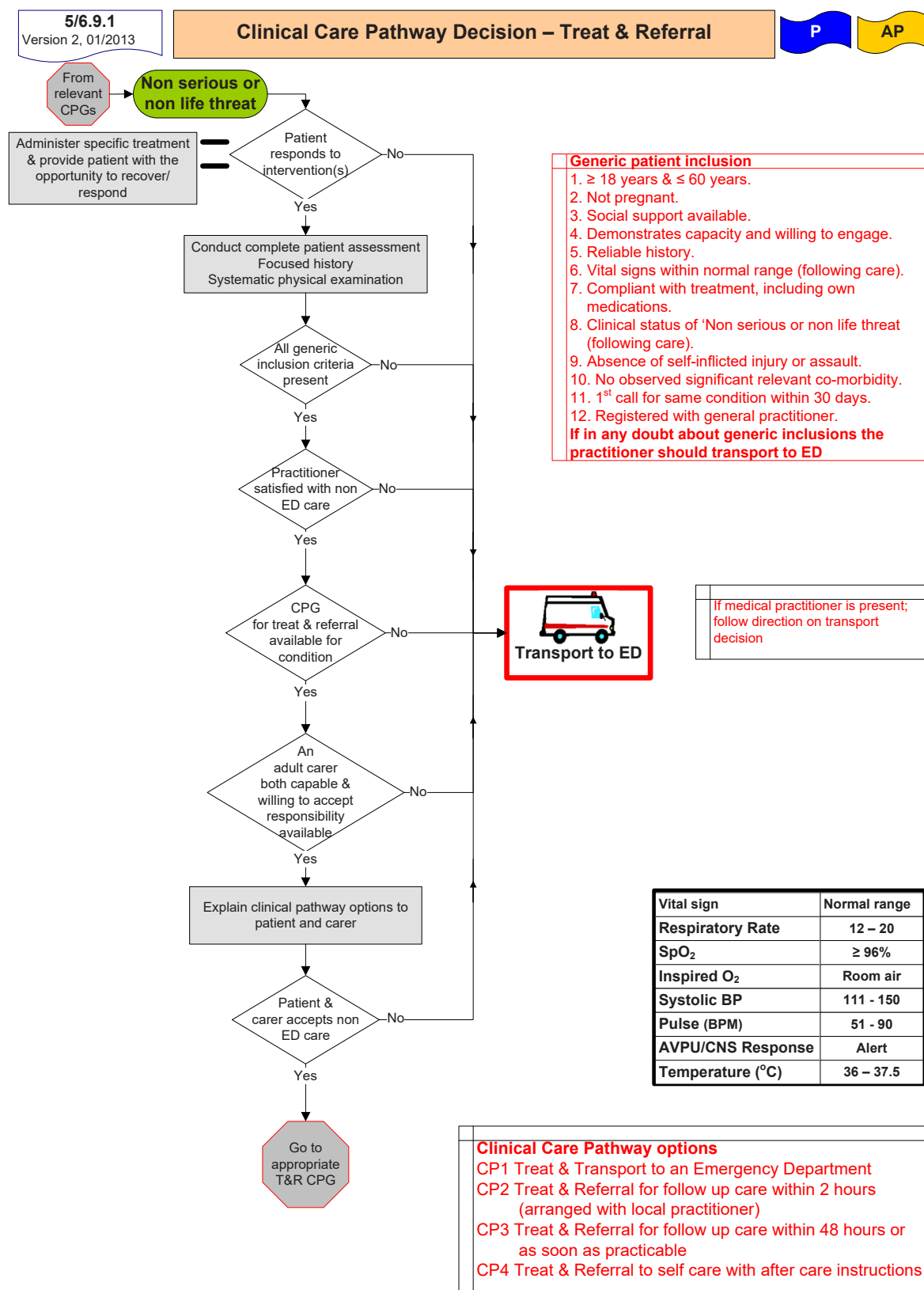
**Do not transport a body in an ambulance  
vehicle unless;**

- The body is recently deceased and in a  
public place where public concern may  
be caused if it is left there
- The emotional circumstance  
associated with the death causes  
severe distress for the family
- Prior to the transport an arrangement  
is in place to accept the body at the  
destination

Reference: POL026 Council Policy for verification of death by paramedics and advanced paramedics Version1

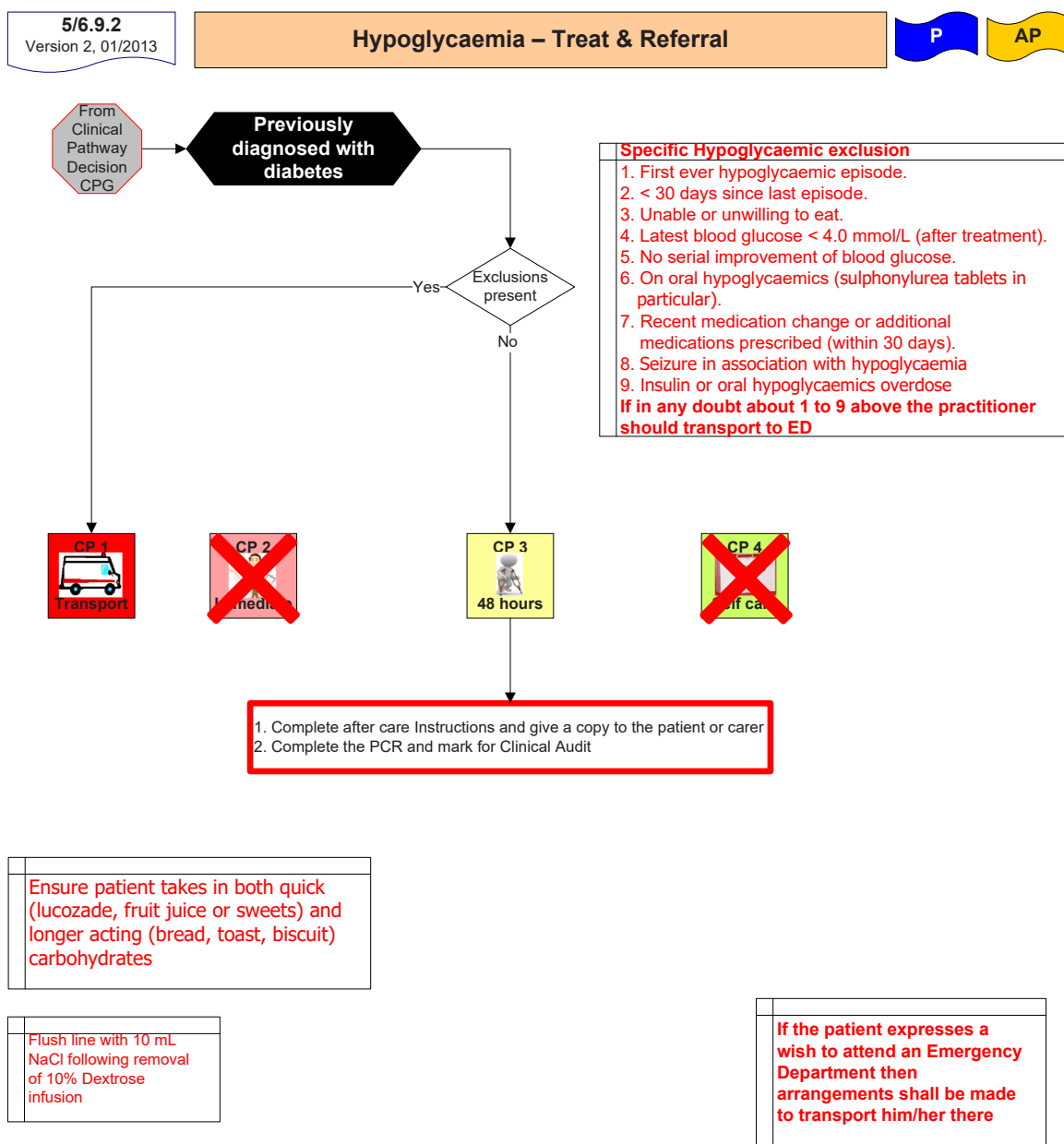


## SECTION 9 - Treat & Referral



Reference: Ambulance Service of NSW, 2008, CARE Clinical Pathways  
HSE Acute Medicine Programme, 2011, Guiding Framework and Policy for the National Early Warning Score System to Recognise and Respond to Clinical Deterioration

## SECTION 9 - Treat & Referral



Reference: HSE Diabetes Programme, 2012  
Ambulance Service of NSW, 2008, CARE Clinical Pathways  
O'Donnell C, 2007, Hypoglycaemia Treat and Discharge Protocol (unpublished)  
Carter A, et al 2002, Transport Refusal by Hypoglycaemic Patients after On-scene Intravenous Dextrose, academic Emergency medicine, Vol. 9, No. 8:p855-857

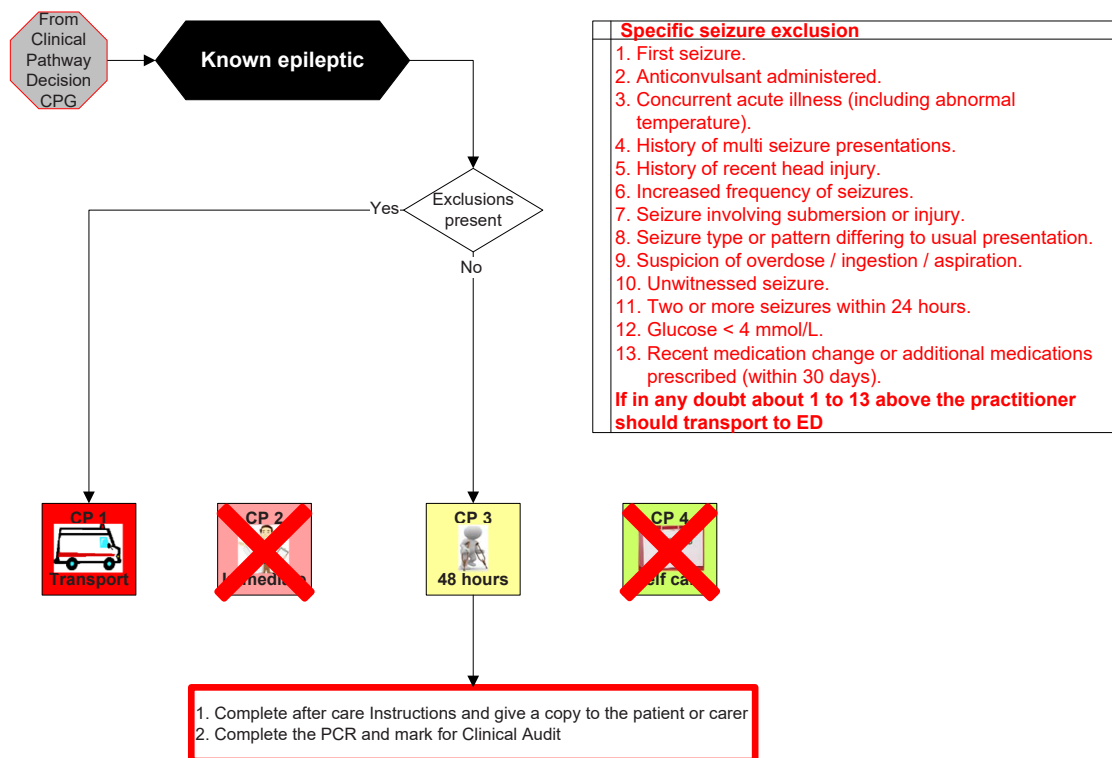
## SECTION 9 - Treat & Referral

5/6.9.3  
Version 2, 01/2013

### Isolated seizure – Treat & Referral

P

AP



Isolated seizure:  
Lasting < 5 minutes  
Similar to previous events

**If the patient expresses a wish to attend an Emergency Department then arrangements shall be made to transport him/her there**

**Reference:** HSE Epilepsy Programme 2012  
Ambulance Service of NSW, 2008, CARE Clinical Pathways  
NICHOLL, J. S. 1999. Prehospital management of the seizure patient. *Emerg Med Serv*, 28, 71-5.  
Simonson, H and Pelberg, A, 1993, Unnecessary Emergency Transport and Care of Grand Mal Seizures, *American Journal of Medical Quality*, Vol 8, No 2, p53-55.  
Mechem, CC et al, 2001, Short-term outcome of seizure patients who refuse transport after out-of-hospital evaluation, *Academy of Emergency medicine*, Mar;8(3):231-6

## APPENDIX 1 – Medication Formulary

The Medication Formulary is published by the Pre-Hospital Emergency Care Council (PHECC) to enable pre-hospital emergency care practitioners to be competent in the use of medications permitted under Medicinal Products 7th Schedule (SI 300 of 2014). This is a summary document only and practitioners are advised to consult with official publications to obtain detailed information about the medications used.

The Medication Formulary is recommended by the Medical Advisory Committee (MAC) prior to publication by Council.

The medications herein may be administered provided:

- 1 The practitioner is in good standing on the PHECC practitioner's Register.
- 2 The practitioner complies with the Clinical Practice Guidelines (CPGs) published by PHECC.
- 3 The practitioner is acting on behalf of an organisation (paid or voluntary) that is a PHECC licensed CPG provider.
- 4 The practitioner is privileged, by the organisation on whose behalf he/she is acting, to administer the medications.
- 5 The practitioner has received training on, and is competent in, the administration of the medication.
- 6 The medications are listed on the Medicinal Products 7th Schedule.

The context for administration of the medications listed here is outlined in the CPGs.

Every effort has been made to ensure accuracy of the medication doses herein. The dose specified on the relevant CPG shall be the definitive dose in relation to practitioner administration of medications. The principle of titrating the dose to the desired effect shall be applied. The onus rests on the practitioner to ensure that he/she is using the latest versions of CPGs which are available on the PHECC website [www.phecc.ie](http://www.phecc.ie)

Sodium Chloride 0.9% (NaCl) is the IV/IO fluid of choice for pre-hospital emergency care.

Water for injection shall be used when diluting medications, however if not available NaCl (0.9%) may be used if not contraindicated.

All medication doses for patients  $\leq$  15 years shall be calculated on a weight basis unless an age related dose is specified for that medication.

The route of administration should be appropriate to the patient's clinical presentation. IO access is authorised for advanced paramedics for Life Threatening Emergencies (or under medical direction).

## APPENDIX 1 – Medication Formulary

**The dose for paediatric patients may never exceed the adult dose.**

**Paediatric weight estimations acceptable to PHECC are:**

Neonate =	3.5 Kg
Six months =	6 Kg
One to five years =	$(\text{age} \times 2) + 8 \text{ Kg}$
Greater than 5 years =	$(\text{age} \times 3) + 7 \text{ Kg}$

### **Pregnancy caution:**

Medications should be prescribed in pregnancy only if the expected benefit to the mother is thought to be greater than the risk to the foetus, and all medications should be avoided if possible during the first trimester.

PHECC practitioners therefore should avoid using medications in early pregnancy unless absolutely essential and where possible medical advice should be sought prior to administration.

### **Paramedic authorisation for IV infusion continuation**

PHECC registered paramedics are authorised to continue an established IV infusion in the absence of an advanced paramedic or doctor during transportation.

**This version contains 47 medications.**

Please visit [www.phecc.ie](http://www.phecc.ie) for the latest edition/version

## APPENDIX 1 – Medication Formulary

### Amendments to the Advanced Paramedic 2014 Edition:

#### New Medications introduced:

- Adenosine
- Ceftriaxone
- Chlorphenamine
- Glycopyrronium Bromide
- Haloperidol
- Hyoscine Butylbromide
- Ketamine
- Methoxyflurane
- Oxytocin

#### Medications removed:


- Benzylpenicillin
- Syntometrine

Amiodarone		
Heading	Add	Delete
Presentation	300 mg (30 mg/mL)	10 mL (30 mg/mL)
Administration		CPG: 5/6.4.7
Indications	(pVT)	(VT)
Usual Dosages	<b>Symptomatic tachycardia:</b> 150 mg – IV Infusion in 100 mL D <sub>5</sub> W <b>Torsades de pointes:</b> 150 mg – IV infusion in 100 mL D <sub>5</sub> W (over 10 minutes) <b>Paediatric:</b> If refractory VF/pVT post Epinephrine and 3rd shock (Amiodarone 5 mg/Kg IV/IO)	<b>VF/VT:</b> 150 mg IV
Side Effects	Hypotension (usually moderate/transient) but can be severe after rapid injection	
Additional Information	For ease of use in paediatric calculations when using 150 mg in 3 mL, add 2 mL D <sub>5</sub> W, making the concentration 150 mg in 5 mL	

Aspirin		
Heading	Add	Delete
Indications	Management of unstable angina and non ST-segment elevation myocardial infarction (NSTEMI) Management of ST-segment elevation myocardial infarction (STEMI)	
Contra-Indicated	(risk of Reye's syndrome)	
Side Effects	Increased bleeding time Skin reactions in hypersensitive patients	

## APPENDIX 1 – Medication Formulary

Atropine		
Heading	Add	Delete
Administration	CPG: 5/6.4.21	CPG: 5/6.4.7
Indications	(from Organophosphorous insecticides)	

Cyclizine		
Heading	Add	Delete
Clinical Level		
Administration	Intramuscular (IM) / Subcutaneous (SC) / Oral (PO) (CPG: 5/6.4.26, 5/6.8.7)	
Usual Dosages	IM <b>Palliative Care:</b> 50 mg PO/SC (Repeat x 1 prn) <b>(AP)</b> <b>Paramedic:</b> Administer IM route	

Diazepam Injection:		
Heading	Add	Delete
Usual Dosages	Maximum 4 doses of Benzodiazepine for adult and paediatric patients regardless of route	Repeat prn to Max 10 mg Repeat prn to Max 0.4 mg/Kg or 10 mg, whichever is least
Additional Information	Can cause injection site reactions/thrombophlebitis, ensure large vein is used. Administer slowly (5 mg/1 ml over 1 minute) If a patient recommences seizing regard it as a new event, administer one dose of Benzodiazepine then consult medical advice	

## APPENDIX 1 – Medication Formulary

Diazepam Rectal Solution		
Heading	Add	Delete
Usual Dosages	Maximum 4 doses for adult and paediatric regardless of route	Repeat x 1 prn Max 20 mg PR Repeat all x 1 after 5 mins if seizure persists or reoccurs
Additional Information	If a patient recommences seizing regard it as a new event, administer one dose of Benzodiazepine then consult medical advice	

Enoxaparin		
Heading	Add	Delete
Contraindication	Patient on oral anticoagulant (Warfarin or NOAC) as thrombolytic contra-indicated	
Side Effect	(do not rub injection site)	

Epinephrine (1:1,000)		
Heading	Add	Delete
Administration	(CPG: 2/3.4.15, 4/5/6.4.11, 4/5/6.7.13)	CPG: 4.4.15, 2/3.4.16, 4.7.31
Indications	Stridor, Symptomatic Bradycardia and Cardiogenic Shock	
Usual Dosages	<b>Paediatric:</b> <b>Stridor (AP):</b> < 1 Year: 2.5 mg NEB / ≥ 1 year: 5 mg NEB (repeat after 30 minutes prn) (AP) <b>Adult:</b> Symptomatic Bradycardia/Cardiogenic Shock (AP): 0.01 mg IV/IO repeat prn (Dilute 1 mg Epinephrine in 100 mL NaCl and draw up in 1 mL syringe, administer the dose over 1 minute)	



## APPENDIX 1 – Medication Formulary

Fentanyl		
Heading	Add	Delete
Administration	Intravenous (IV)	
Usual Dosages	Adults 0.05 mg (50 mcg) IV	
Contra-Indicated	< 1-year-old	
Additional Information	Following Fentanyl IN, the next dose may be either Fentanyl or Morphine IV, but not both (Adults) In the absence of acquiring IV access, a second dose of IN Fentanyl may be administered Controlled under schedule 2 of the Misuse of Drugs Regulations S.I. No. 328 of 1988	

Furosemide:		
Heading	Add	Delete
Contra-Indications	Known Hypokalaemia	
Additional information	The SPC recommends administration at 4 mg/min IV	

Glucagon:		
Heading	Add	Delete
Administration		CPG: 4.4.19, 4.7.32
Additional information	Hypoglycaemic paediatrics patients who are not diagnosed as diabetic should not be administered Glucagon (this does not preclude the administration of Glucose gel or Dextrose to treat hypoglycaemia)	

Glucose gel		
Heading	Add	Delete
Administration		CPG: 4.4.19, 4.7.32

Glyceryl trinitrate (GTN)		
Heading	Add	Delete
Administration	(CPG: 1/2/3.4.10)	
Indications	EMT: Systolic BP $\geq$ 110	
Contra-Indications	Severe mitral stenosis	
Additional Information	Caution with inferior wall MI with right ventricular involvement as this may lead to profound hypotension	

## APPENDIX 1 – Medication Formulary

Hartmann's Solution		
Heading	Add	Delete
Contra-Indications	Do not use with Ceftriaxone	

Hydrocortisone		
Heading	Add	Delete
Administration	(CPG: 4/5/6.4.15, 4/5/6.7.31)	
Usual Dosages	<p><b>Adult:</b></p> <p><b>Anaphylactic reaction:</b> (AP) 200 mg IV (infusion in 100 mL NaCl) or IM injection (P &amp; AP)</p> <p><b>Exacerbation of COPD:</b> 200 mg IV (infusion in 100 mL NaCl) or IM (AP)</p> <p><b>Asthma:</b> 100 mg slow IV (infusion in 100 mL NaCl) (AP)</p> <p><b>Adrenal insufficiency:</b> (AP) 100 mg IV (infusion in 100 mL NaCl) or IM (P &amp; AP)</p> <p><b>Paediatric:</b></p> <p><b>Anaphylactic reaction:</b>                      &lt; 1 year: (AP) - 25 mg IV (infusion in 100 mL NaCl) or IM injection (P &amp; AP)                      1 to 5 years: (AP) - 50 mg IV (infusion in 100 mL NaCl) or IM injection (P &amp; AP)                      &gt; 5 years: (AP) - 100 mg IV (infusion in 100 mL NaCl) or IM injection (P &amp; AP)</p> <p><b>Asthma:</b> (AP) &lt; 1 year: 25 mg / 1 to 5 years: 50 mg / &gt; 5 years: 100 mg IV - (infusion in 100 mL NaCl)</p> <p><b>Adrenal insufficiency:</b>                      6 months to ≤ 5 years: (AP) 50 mg IV (infusion in 100 mL NaCl) or IM injection (P &amp; AP)                      &gt; 5 years: (AP) 100 mg IV (infusion in 100 mL NaCl) or IM injection (P &amp; AP)</p>	<p><b>Asthma (AP) and Adrenal insufficiency (P &amp; AP):</b> 100 mg IV (infusion in 100 mL NaCl) or IM</p> <p><b>6 mths to ≤ 5 yrs:</b> 50 mg IV (infusion in 100 mL NaCl) or IM</p> <p><b>&gt; 5 years:</b> 100 mg IV (infusion in 100 mL NaCl) or IM</p>

Ibuprofen		
Heading	Add	Delete
Presentation	200 mg in 5 mL	
Contra-Indications	Known renal failure / Known severe liver failure / Known severe heart failure / Concurrent NSAID use (e.g. Diclofenac, Naproxen)	
Usual Dosages	400 mg PO (Mild pain) 600 mg PO (Moderate pain)	
Additional Information	Caution if on oral anticoagulant (e.g. Warfarin, Rivaroxaban, Apixaban, Edoxaban) due to increased bleeding risk	

## APPENDIX 1 – Medication Formulary

Lidocaine		
Heading	Add	Delete
Administration	(CPG: 4/5/6.7.22)	
Indications	VF/pVT	VF/VT
Usual Dosages	<b>Adult:</b> 100 mg IV  <b>Paediatric:</b> 1–1.5 mg/Kg IV	1–1.5 mg/Kg IV Max: 3 mg/Kg  Not Indicated

Lorazepam		
Heading	Add	Delete
Administration	(CPG: 4/5/6.4.30)	CPG: 6.4.29
Usual Dosages	Repeat x 1 prn	

Magnesium Sulphate Injection		
Heading	Add	Delete
Indications	Life-threatening Asthma	
Administration		CPG: 4/5/6.4.3
Usual Dosages	<b>Life-threatening Asthma:</b> 2 g IV (infusion in 100 mL NaCl) given over 20 minutes  <b>Infusion times added for the following:</b> Persistent bronchospasm: given over 20 minutes Tachycardia – Irregular: Torsades de pointes with a pulse: given over 10 – 15 minutes Seizure associated with pre-eclampsia: given over 15 minutes	
Side effects	-Bradycardia can occur during administration; this can be minimised by slowing the rate of infusion -Arrhythmias / Coma / Confusion / Drowsiness / Flushing of skin / Hypotension / Muscle weakness / Nausea / Thirst / Vomiting	Bradycardia Hypothermia
Additional Information	5 g in 10 mL is equivalent to 20 mmol/mg	

## APPENDIX 1 – Medication Formulary


Midazolam Solution		
Heading	Add	Delete
Administration	(CPG: 5/6.8.7, 4/5/6.4.30)	
Indications	Sedation (following medical advice)	
Usual Dosages	<p><b>Palliative Care:</b> 2.5 mg SC (AP) Alternatively 2.5 – 5 mg buccal (P &amp; AP) repeat x 1 prn Maximum 4 doses of Benzodiazepine for adult and paediatric seizing patients regardless of route</p> <p><b>Behavioural Emergency:</b> AP – Seek medical advice regarding sedation</p> <p><b>Adults:</b> 5 mg IN/IM – (Repeat x 2 prn) (AP)</p> <p><b>Paediatric:</b> 0.1 mg/Kg IN – (Repeat x 2 prn) (AP)</p>	Repeat x 1 prn
Additional Information	Contraindications, other than KSAR, refer to non-seizing patients. If patient recommences seizing regard it as a new event, administer additional dose then consider medical advice (AP)	No more than two doses by practitioners

Morphine Sulphate		
Heading	Add	Delete
Presentation	Oral	
Administration	(CPG: 5/6.8.7)	
Usual Dosages	<p>4 mg IV, initial dose Repeat Morphine 2 mg at not &lt; 2 min intervals prn if indicated (Max 16 mg) For musculoskeletal pain (Max 20 mg)</p> <p><b>Palliative Care:</b> 2.5 – 5 mg SC/PO (Repeat x 1 prn)</p>	<p>2 mg IV/IO Repeat at not &lt; 2 min intervals prn if indicated to Max 10 mg For musculoskeletal pain, Max 16 mg</p>
Additional Information	N.B. Controlled under Schedule 2 of the Misuse of Drugs Regulations 1988 (Sl. no 328)	

## APPENDIX 1 – Medication Formulary

Naloxone		
Heading	Add	Delete
Administration	(CPG: 5/6.4.7)	

Nifedipine		
Heading	Add	Delete
Side effects	Asthenia / Dizziness / Palpitation / Vasodilatation	Bradycardia

Ondansetron		
Heading	Add	Delete
Clinical Level		
Administration	IM (CPG: 5/6.4.26)	CPG: 4/5/6.2.6
Usual Dosages	IM	
Side effects	Injection site reactions (rash, urticaria, itching) <b>Uncommon:</b> Arrhythmias / Bradycardia / Hypotension / Seizures	
Additional Information	Caution in patients with a known history or family history of cardiac conduction intervals (QT prolongation) or if patient has history of arrhythmias or electrolyte imbalance	

Oxygen		
Heading	Add	Delete
Administration	CPAP device	
Indications	SpO <sub>2</sub> < 90% for patients with acute onset of Pulmonary Oedema	
Usual Dosages	Neonatal Resuscitation (< 4 weeks) Consider supplemental O <sub>2</sub> (≤ 30%)	

## APPENDIX 1 – Medication Formulary

Paracetamol		
Heading	Add	Delete
Presentation	Rectal suppository 1 g, 500 mg, 250 mg, 240 mg, 125 mg, 120 mg, 80 mg glass vial, 1 g of Paracetamol in 100 mL solution for infusion	180 mg and 60 mg
Administration	IV infusion (CPG: 5/6.8.7, 5/6.7.34)	
Indications	<b>Adult:</b> Pyrexia / Temperature > 38.3°C / Minor to moderate pain for adult patients <b>Paediatric:</b> Pyrexia / Temperature > 38.5°C / Minor to moderate pain for paediatric patients	
Usual Dosages	1 g IV infusion (AP) If estimated weight < 50 Kg, 15 mg/Kg <b>Palliative Care:</b> 1 g PO (Repeat x 1 prn) <b>Paediatric: IV Infusion (AP)</b> < 1 year – 7.5 mg/Kg IV ≥ 1 year – 15 mg/Kg IV	

Salbutamol		
Heading	Add	Delete
Administration		CPG: 4.4.15, 2/3.4.16, 4.7.31, 3.7.12
Usual Dosages	0.1 mg metered aerosol spray (repeat aerosol x 11 prn) <b>EFR:</b> assist patient with Asthma/Anaphylaxis 0.1 mg metered aerosol spray (repeat aerosol x 11 prn) <b>Paediatric:</b> < 5 yrs – 0.1 mg metered aerosol spray (repeat aerosol x 5 prn) > 5 yrs – 0.1 mg metered aerosol spray (repeat aerosol x 11 prn) <b>EFR:</b> assist patient with Asthma/Anaphylaxis < 5 yrs – 0.1 mg metered aerosol spray (repeat aerosol x 5 prn) ≥ 5 yrs – 0.1 mg metered aerosol spray (repeat aerosol x 11 prn)	(0.1 mg metered aerosol spray x 5) <b>EFRs:</b> (0.1 mg metered aerosol spray x 2) <b>Paediatric:</b> < 5 yrs – (0.1 mg metered aerosol spray x 3) > 5 yrs – (0.1 mg metered aerosol spray x 5)

## APPENDIX 1 – Medication Formulary

Sodium Chloride 0.9% (NaCl)		
Heading	Add	Delete
Usual Dosages	<b>Asystole / PEA</b> - Consider fluid challenge 1 L IV/IO (repeat prn) <b>Suspension Trauma</b> - 2 L IV (Maintain systolic BP > 90 mmHg) <b>Tachycardia</b> - (Torsades de pointes) 250 mL IV infusion	

Tranexamic Acid		
Heading	Add	Delete
Administration	(CPG: 4/5/6.5.4)	
Contra-Indications	Known severe renal impairment	
Indications	Postpartum Haemorrhage	

## APPENDIX 1 – Medication Formulary

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## APPENDIX 1 – Medication Formulary

Clinical level:

AP

Medication	Adenosine
<b>Class</b>	Antiarrhythmic agent.
<b>Descriptions</b>	Antiarrhythmic agent used to treat supraventricular tachycardia.
<b>Presentation</b>	6 mg in 2 mL solution. 3 mg per 1 mL (30 mg/10 mL) solution for infusion vials.
<b>Administration</b>	Intravenous (IV). ( <i>CPG</i> : 5/6.4.12).
<b>Indications</b>	Paroxysmal supraventricular tachycardia (> 180) with signs of poor perfusion.
<b>Contra-Indications</b>	Known severe adverse reaction / Asthma / Chronic obstructive lung disease / Decompensated heart failure / Long QT syndrome / Second or third degree AV block / Severe hypotension / Sick sinus syndrome (unless pacemaker fitted).
<b>Usual Dosages</b>	<b>Adult:</b> 6 mg IV. <b>Initial Adenosine unsuccessful:</b> Repeat at 12 mg x 2 prn Max. <b>Paediatric:</b> Not indicated.
<b>Pharmacology / Action</b>	<b>Antiarrhythmic</b> Rapid reversion to sinus rhythm of paroxysmal supraventricular tachycardia.
<b>Side effects</b>	Angina (discontinue). Apprehension - arrhythmia (discontinue if asystole or severe bradycardia occur). AV block / Dizziness / Dyspnoea / Flushing / Headache / Nausea / Sinus pause. <b>Uncommon:</b> Blurred vision / Hyperventilation / Metallic taste / Palpitation / Sweating / Weakness.
<b>Additional information</b>	Initially 6 mg, administered into large peripheral vein and given over 2 seconds, followed by rapid 10 mL NaCl 0.9% flush. Repeat doses of 12 mg administered rapidly also. Cardiac monitoring required. <b>Cautions:</b> Atrial fibrillation with accessory pathway / Atrial flutter with accessory pathway Autonomic dysfunction / Bundle branch block / First-degree AV block / Heart transplant / Recent MI / Severe heart failure / Stenotic valvular heart disease / Uncorrected hypovolaemia.

## APPENDIX 1 – Medication Formulary

Clinical level:

AP

Medication	Amiodarone
Class	Antiarrhythmic agent.
Descriptions	Class III antiarrhythmic agent used to treat ventricular arrhythmia.
Presentation	150 mg in 3 mL solution. Pre-filled syringe of 300 mg (30 mg/mL).
Administration	Intravenous (IV). Intraosseous (IO). ( <i>CPG: 4/5/6.4.3, 5/6.4.12, 4/5/6.7.22</i> ).
Indications	Ventricular Fibrillation (VF) and Pulseless Ventricular Tachycardia (pVT). Symptomatic Tachycardia (> 150).
Contra-Indications	Known severe adverse reaction. Known hypersensitivity to Iodine.
Usual Dosages	<b>Adult:</b> <b>VF/pVT:</b> 5 mg/Kg IV/IO. <b>Loading dose for cardiac arrest:</b> 300 mg and one supplemental dose of 150 mg. <b>Symptomatic tachycardia:</b> 150 mg - IV infusion in 100 mL D <sub>5</sub> W (over 10 minutes). <b>Torsades de pointes:</b> 150 mg - IV infusion in 100 mL D <sub>5</sub> W (over 10 minutes). <b>Paediatric:</b> <b>VF/pVT:</b> 5 mg/Kg IV/IO, if refractory VF/pVT post Epinephrine and 3 <sup>rd</sup> shock.
Pharmacology / Action	<b>Antiarrhythmic:</b> Prolongs the action potential / Prolongs the refractory period / Prolongs atrioventricular conduction / Prolongs QT interval.
Side effects	Inflammation of peripheral veins / Bradycardia / AV conducting abnormalities. Hypotension (usually moderate / transient) but can be severe after rapid injection.
Additional information	If diluted mix with Dextrose 5% (for infusion use 100 mL D <sub>5</sub> W). May be flushed with NaCl. For cardiac arrest do not dilute, administer directly followed by a flush. For ease of use in paediatric calculations when using 150 mg in 3 mL, add 2 mL D <sub>5</sub> W, making the concentration 150 mg in 5 mL.

## APPENDIX 1 – Medication Formulary

Clinical level:      

Medication	Aspirin
<b>Class</b>	Platelet aggregation inhibitor.
<b>Descriptions</b>	Anti-inflammatory agent and an inhibitor of platelet function. Useful agent in the treatment of various thromboembolic diseases such as acute myocardial infarction.
<b>Presentation</b>	300 mg dispersible tablet.
<b>Administration</b>	Orally (PO) - dispersed in water, or to be chewed - if not dispersible form. ( <b>CPG:</b> 5/6.4.10, 4.4.10, 1/2/3.4.10).
<b>Indications</b>	Cardiac chest pain or suspected myocardial infarction. Management of unstable angina and non ST-segment elevation myocardial infarction (NSTEMI). Management of ST-segment elevation myocardial infarction (STEMI).
<b>Contra-Indications</b>	Active symptomatic gastrointestinal (GI) ulcer / Bleeding disorder (e.g. haemophilia) / Known severe adverse reaction / Patients < 16 years old (risk of Reye's syndrome) .
<b>Usual Dosages</b>	<b>Adult:</b> 300 mg tablet. <b>Paediatric:</b> Contraindicated.
<b>Pharmacology / Action</b>	<b>Antithrombotic:</b> Inhibits the formation of thromboxane A <sub>2</sub> , which stimulates platelet aggregation and artery constriction. This reduces clot/thrombus formation in an MI.
<b>Side effects</b>	Epigastric pain and discomfort / Bronchospasm / Gastrointestinal haemorrhage / Increased bleeding time / Skin reactions in hypersensitive patients.
<b>Long term effects</b>	Generally mild and infrequent but incidence of gastro-intestinal irritation with slight asymptomatic blood loss, increased bleeding time, bronchospasm and skin reaction in hypersensitive patients.
<b>Additional information</b>	Aspirin 300 mg is indicated for cardiac chest pain regardless if patient is on anti-coagulants or is already on Aspirin. If the patient has swallowed an Aspirin (enteric coated) preparation without chewing it, the patient should be regarded as not having taken any Aspirin; administer 300 mg PO.

## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Atropine
<b>Class</b>	Anticholinergic (parasympatholytic).
<b>Descriptions</b>	Parasympatholytic (Anticholinergic) that is derived from parts of the <i>Atropa belladonna</i> plant.
<b>Presentation</b>	Pre-filled disposable syringe 1 mg/10 mL. Ampoule 0.6 mg in 1mL.
<b>Administration</b>	Intravenous (IV). Intraosseous (IO). ( <b>CPG:</b> 5/6.3.5, 4/5/6.4.11, 5/6.4.21, 6.4.22).
<b>Indications</b>	<b>Adult:</b> Symptomatic bradycardia. Cholinergic poison (from Organophosphorus insecticides) with bradycardia and salivation.
<b>Contra-Indications</b>	Known severe adverse reaction / Post-cardiac transplantation.
<b>Usual Dosages</b>	<b>Adult:</b> <b>Cholinergic poison with bradycardia and salivation:</b> 1 mg IV. (Repeat at 3-5 min intervals to ensure minimal salivary secretions). <b>Symptomatic Bradycardia:</b> 0.6 mg (600 mcg) IV. (Repeat at 3-5 min intervals to Max 3 mg). <b>Paediatric:</b> Not indicated.
<b>Pharmacology / Action</b>	<b>Anticholinergic agent:</b> Blocks acetylcholine receptors. Enhances SA node automaticity. Enhance AV node conduction. Increases heart rate.
<b>Side effects</b>	Tachycardia / Dry mouth / Dilated pupils.
<b>Additional information</b>	Accidental exposure to the eye causes blurred vision.

## APPENDIX 1 – Medication Formulary

Clinical level:

AP

Medication	Ceftriaxone
Class	Antibiotic, Antibacterial.
Descriptions	Antibacterial for systemic use.
Presentation	Ceftriaxone (as Ceftriaxone sodium) powder for solution for injection vials, 250 mg / 1 g / 2 g for IV administration. Powder and solvent for solution, for IM injection. White to yellowish-orange crystalline powder.
Administration	IV/IO/IM. <b>IV/IO:</b> Reconstitute each 1 g vial in 10 mL of water for injection BP. Should be administered over 2-4 minutes. <b>Intravenous infusion:</b> Reconstitute 2 g of Ceftriaxone in 100 mL of one of the following calcium-free solutions: <ul style="list-style-type: none"> <li>Dextrose 5% or 10%</li> <li>Sodium Chloride (NaCl 0.9%)</li> </ul> The Infusion should be administered over at least 30 minutes. <b>IM:</b> Reconstitute each 1 g vial with 2 mL of 1% Lidocaine Hydrochloride injection and administer by deep intramuscular injection. (CPG: 4/5/6.4.24, 5/6.7.34).
Indications	Severe sepsis – Adult and Paediatric.
Contra-Indications	Age < 1 month Known severe adverse reaction. Hx of severe hypersensitivity (e.g. anaphylactic reaction) to any beta-lactam antibacterial (Penicillins, Cephalosporins, Aztreonam, Meropenem, Ertapenem). <b>Ceftriaxone solutions containing Lidocaine should never be administered IV</b>
Usual Dosages	<b>Adult:</b> 2 g IV/IO/IM. <b>Paediatric:</b> 1 Month – 11 years: 50 mg/Kg IV injection over 2-4 minutes or deep IM injection. > 11 years or body weight > 50 Kg: 2 g IV/IO/IM
Pharmacology / Action	Antibacterial spectrum.
Side effects	Diarrhoea / Rash / Headache / Dizziness / Nausea / Vomiting / Pruritus.
Additional information	Ceftriaxone <b>must not</b> be mixed or administered simultaneously with any calcium-containing intravenous solutions. Intramuscular doses > 1 g (2 mL) divide into more than one injection site. Preferred route > 1 g is by IV infusion. IM injection may be mixed with 2 mL of 1% Lidocaine Hydrochloride injection to reduce pain at the IM injection site. The resulting solution should never be administered intravenously.

## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Chlorphenamine
Class	Antihistamine
Descriptions	H <sub>1</sub> antagonist to counteract the effects of histamine release.
Presentation	10 mg in 1 mL ampoule. 4 mg tablet.
Administration	Intravenous (IV), Intramuscular (IM) and Orally (PO).  (CPG: 4/5/6.4.15, 4/5/6.7.31).
Indications	Anaphylaxis or allergic reaction.
Contra-Indications	Known severe adverse reaction / Pre-coma states.
Usual Dosages	<p><b>Adult:</b>  <i>Allergic reaction</i>  Mild: - 4 mg PO (EMT / P / AP).  Moderate: - 4 mg PO or 10 mg IM (EMT / P) or 10 mg IV (AP).  Severe/Anaphylaxis: - 10 mg IM (EMT / P) or 10 mg IV (AP).</p> <p><b>Paediatric:</b>  <i>Allergic reaction:</i>  Mild: 6 to 11 years – 2 mg PO (EMT / P / AP).  ≥ 12 years – 4 mg PO (EMT / P / AP).</p> <p>Moderate: &lt; 1 year – 0.25 mg/Kg IM (EMT / P) or 0.25 mg/Kg IV (AP).  1 to 5 years – 2.5 mg IM (EMT / P) or 2.5 mg IV (AP).  6 to 11 years – 2 mg PO or 5 mg IM (EMT / P) or 5 mg IV (AP).  ≥ 12 years – 4 mg PO or 10 mg IM (EMT / P) or 10 mg IV (AP).</p> <p>Severe / Anaphylaxis: &lt; 1 year – 0.25 mg/Kg IM (EMT / P) or 0.25 mg/Kg IV (AP).  1 to 5 years – 2.5 mg IM (EMT / P) or 2.5 mg IV (AP).  6 to 11 years – 5 mg IM (EMT / P) or 5 mg IV (AP).  ≥ 12 years – 10 mg IM (EMT / P) or 10 mg IV (AP).</p>
Pharmacology / Action	Chlorphenamine is a potent antihistamine (H <sub>1</sub> -receptor antagonist). Antihistamines diminish or abolish the action of histamine in the body by competitive reversible blockade of histamine 1 receptor sites on tissues. Chlorphenamine also has anticholinergic activity.
Side effects	Causes drowsiness and patients receiving it should not drive or operate machinery.
Additional information	Use with caution in epilepsy / Prostatic hypertrophy / Glaucoma / Hepatic disease / Bronchitis / Bronchiectasis / Thyrotoxicosis / Raised intra-ocular pressure / Severe hypertension / Cardiovascular disease / Bronchial asthma.  For IV route, administer over 1 minute.  If small dose required, dilute with NaCl 0.9%.

## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Clopidogrel
<b>Class</b>	Platelet aggregation inhibitor.
<b>Descriptions</b>	An inhibitor of platelet function.
<b>Presentation</b>	300 mg tablet. 75 mg tablet.
<b>Administration</b>	Orally (PO). ( <b>CPG:</b> 5/6.4.10).
<b>Indications</b>	ST elevation myocardial infarction (STEMI) if the patient is not for PPCI.
<b>Contra-Indications</b>	Known severe adverse reaction / Active pathological bleeding / Severe liver impairment.
<b>Usual Dosages</b>	<b>Adult:</b> 300 mg PO. (≥ 75 years: 75 mg PO). <b>Paediatric:</b> Not indicated.
<b>Pharmacology / Action</b>	Clopidogrel selectively inhibits the binding of adenosine diphosphate (ADP) to its platelet receptor, and the subsequent ADP-mediated activation of the GPIIb/IIIa complex, thereby inhibiting platelet aggregation.  Biotransformation of Clopidogrel is necessary to produce inhibition of platelet aggregation. Clopidogrel acts by irreversibly modifying the platelet ADP receptor.
<b>Side effects</b>	Abdominal pain / Dyspepsia / Diarrhoea.
<b>Additional information</b>	If a patient has been loaded with an anti-platelet medication (other than Aspirin), prior to the arrival of the practitioner, the patient should not have Clopidogrel administered.

## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Cyclizine
<b>Class</b>	Antiemetic.
<b>Descriptions</b>	Used in management of nausea & vomiting.
<b>Presentation</b>	Ampoule 50 mg in 1 mL.
<b>Administration</b>	Intravenous (IV). Intraosseous (IO). Intramuscular (IM). Subcutaneous (SC). Oral (PO). ( <b>CPG:</b> 5/6.4.26, 5/6.8.7).
<b>Indications</b>	Management, prevention and treatment of nausea and vomiting.
<b>Contra-Indications</b>	Known severe adverse reaction.
<b>Usual Dosages</b>	<b>Adult:</b> 50 mg slow IV/IO or IM.  <b>Palliative Care:</b> 50 mg SC/PO. (Repeat x 1 prn - AP).  <b>Paediatric:</b> Not indicated.
<b>Pharmacology / Action</b>	Anti-emetic.
<b>Side effects</b>	Tachycardia / Dry Mouth / Sedation.
<b>Additional information</b>	IM route should only be utilised where IV or IO access is not available.



## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Dextrose 10% Solution
Class	Carbohydrate.
Descriptions	Dextrose is used to describe the six-carbon sugar d-glucose, which is the principal form of carbohydrate used by the body. D <sub>10</sub> W is a hypertonic solution.
Presentation	Soft pack for infusion 250 mL and 500 mL.
Administration	Intravenous (IV) Infusion/bolus. Intraosseous (IO). <b>Paramedic:</b> Maintain infusion once commenced. (CPG: 5/6.4.19, 4/5/6.7.32).
Indications	Hypoglycaemic Emergency. Blood glucose level < 4 mmol/L.
Contra-Indications	Known severe adverse reaction.
Usual Dosages	<b>Adult:</b> 250 mL IV/IO infusion (repeat x 1 prn). <b>Paediatric:</b> 5 mL/Kg IV/IO (repeat x 1 prn).
Pharmacology / Action	Hypertonic glucose solution. Dextrose is a readily utilisable energy source.
Side effects	Necrosis of tissue around IV access.
Additional information	Also called Glucose. Cannula patency will reduce the effect of tissue necrosis. Advanced paramedics should use as large a vein as possible.

## APPENDIX 1 – Medication Formulary

Clinical level:



<b>Medication</b>	<b>DEXTROSE 5% SOLUTION</b>
<b>Class</b>	Carbohydrate.
<b>Descriptions</b>	Dextrose is used to describe the six-carbon sugar d-glucose, which is the principal form of carbohydrate used by the body. D <sub>5</sub> W is a hypertonic solution and is used as an infusion medium for Amiodarone.
<b>Presentation</b>	Soft pack for infusion 100 mL and 500 mL.
<b>Administration</b>	Intravenous (IV) infusion. Intraosseous (IO) infusion. <b>Paramedic:</b> Maintain infusion once commenced. ( <b>CPG:</b> May be used for medication dilution on CPGs).
<b>Indications</b>	Use as a dilutant for Amiodarone infusion.
<b>Contra-Indications</b>	Known severe adverse reaction.
<b>Usual Dosages</b>	<b>Adult:</b> Dilute appropriate dose of Amiodarone in 100 mL or 500 mL. <b>Paediatric:</b> Not indicated.
<b>Pharmacology / Action</b>	Dextrose 5% (D <sub>5</sub> W) is used as an infusion medium for the administration of Amiodarone.
<b>Side effects</b>	Necrosis of tissue around IV access.
<b>Additional information</b>	

## APPENDIX 1 – Medication Formulary

Clinical level:

AP

Medication	<b>Diazepam injection</b>
Class	Benzodiazepine.
Descriptions	It is a Benzodiazepine that is used to terminate seizures.
Presentation	Ampoule 10 mg in 2 mL.
Administration	Intravenous (IV). Intraosseous (IO). ( <b>CPG:</b> 5/6.4.23, 5/6.7.33).
Indications	Seizure.
Contra-Indications	Known severe adverse reaction / Respiratory depression / Shock / Depressed vital signs or alcohol-related altered level of consciousness
Usual Dosages	<b>Adult:</b> 5 mg IV/IO. <b>Paediatric:</b> 0.1 mg/Kg IV/IO. Maximum 4 doses of Benzodiazepine for adult and paediatric patients regardless of route.
Pharmacology / Action	<b>Benzodiazepine sedative:</b> Inhibits the firing of hyper excitable neurones through enhancement of the action of the inhibitory transmitter, GABA. This results in CNS depressant, anticonvulsant, sedative and skeletal muscle relaxant effects.
Side effects	Hypotension / Respiratory depression / Drowsiness and light-headedness (the next day).
Long term side effects	Confusion and ataxia (especially in the elderly) / Amnesia / Dependence / Paradoxical increase in aggression and muscle weakness.
Additional information	Diazepam IV should be titrated to effect. Can cause injection site reactions/thrombophlebitis, ensure large vein is used. Administer slowly (5 mg/1 mL over 1 minute). The maximum dose of Diazepam includes that administered by carer prior to arrival of practitioner. If a patient recommences seizing regard it as a new event, administer one dose of Benzodiazepine then consult medical advice.

## APPENDIX 1 – Medication Formulary

Clinical level:

**AP**

Medication	<b>Diazepam Rectal Solution</b>
<b>Class</b>	Benzodiazepine.
<b>Descriptions</b>	It is a Benzodiazepine that is used to terminate seizures.
<b>Presentation</b>	<b>Rectal tube:</b>  <i>Available as:</i> 2.5 mg / 1.25 mL (2 mg/mL). 5 mg / 2.5 mL (2 mg/mL). 10 mg / 2.5 mL (4 mg/mL).
<b>Administration</b>	Per Rectum (PR).  ( <i>CPG:</i> 5/6.4.23, 5/6.7.33).
<b>Indications</b>	Seizure.
<b>Contra-Indications</b>	Known severe adverse reaction / Respiratory depression / Shock / Depressed vital signs or alcohol related altered level of consciousness.
<b>Usual Dosages</b>	<b>Adult:</b> 10 mg (PR).  <b>Paediatric:</b>  < 3 years: 2.5 mg (PR). 3 to 7 years: 5 mg (PR). ≥ 8 years: 10 mg (PR).  Maximum 4 doses of Benzodiazepine for adult and paediatric patients regardless of route.
<b>Pharmacology / Action</b>	<b>Benzodiazepine sedative:</b> Inhibits the firing of hyper excitable neurones through enhancement of the action of the inhibitory transmitter, GABA. This results in CNS depressant, anticonvulsant, sedative and skeletal muscle relaxant effects.
<b>Side effects</b> <b>Long term side effects</b>	Hypotension / Respiratory depression / Drowsiness and light-headedness (the next day). Confusion and ataxia (especially in the elderly) / Amnesia / Dependence / Paradoxical increase in aggression and muscle weakness.
<b>Additional information</b>	Be aware of modesty of patient. Should be administered in the presence of a 2 <sup>nd</sup> person. Egg and soya proteins are used in the manufacture of Diazepam Rectal Solution; allergies to these proteins may be encountered. The maximum dose of Diazepam includes that administered by carer prior to arrival of practitioner. If a patient recommences seizing regard it as a new event, administer one dose of Benzodiazepine then consult medical advice.

## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Enoxaparin Sodium Solution
Class	Anticoagulant.
Descriptions	Enoxaparin is a Low Molecular Weight Heparin used in conjunction with a thrombolytic agent for the treatment of STEMI.
Presentation	Pre-filled Syringes (100 mg/mL).
Administration	Intravenous (IV). (CPG: 5/6.4.10).
Indications	Acute ST-segment elevation myocardial infarction (STEMI) immediately following the administration of a thrombolytic agent.
Contra-Indications	Active major bleeding disorders and conditions with a high risk of uncontrolled haemorrhage, including recent haemorrhagic stroke or subdural haematoma; In jaundice / Active gastric or duodenal ulceration / Hiatal ulceration / Threatened abortion / Retinopathy. Hypersensitivity to Enoxaparin or other Low Molecular Weight Heparins. Known severe adverse reaction. Patient on oral anticoagulant as (Warfarin or new oral anticoagulant NOAC) thrombolytic contra-indicated.
Usual Dosages	<b>Adult:</b> 30 mg IV bolus. (> 75 years: 0.75 mg/Kg SC). <b>Paediatric:</b> Not indicated.
Pharmacology / Action	It binds to the natural inhibitor of coagulation, antithrombin III and makes certain clotting factors inactive. This results in an increase in the clotting time.
Side effects	Pain, haematoma and mild local irritation may follow the subcutaneous injection (do not rub injection site).
Additional information	Do not store above 25°C. Do not refrigerate or freeze. <b>Medical Practitioners:</b> Due to the significant increased risk of intra-cerebral bleed for patients aged > 75 years <b><u>Do Not</u></b> administer IV Enoxaparin. <b>Enoxaparin 0.75 mg/Kg SC:</b> (Max 75 mg SC) is the recommended dose and route.

## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	<b>Epinephrine (1:10,000)</b>
Class	Sympathetic agonist.
Descriptions	Naturally occurring catecholamine. It is a potent alpha and beta adrenergic stimulant; however, its effect on beta receptors is more profound.
Presentation	Pre-filled syringe. 1 mg/10 mL (1:10,000) as 0.1 mg/mL.
Administration	Intravenous (IV). Intraosseous (IO). ( <b>CPG:</b> 4/5/6.4.3, 5/6.4.4, 4/5/6.4.6, 5/6.5.2, 4/5/6.7.22, 4/5/6.7.23, 4/5/6.7.24).
Indications	Cardiac arrest / Paediatric bradycardia unresponsive to other measures.
Contra-Indications	Known severe adverse reaction.
Usual Dosages	<b>Adult:</b> <b>Cardiac arrest:</b> 1 mg (1:10,000) IV/IO. (Repeat every 3-5 mins). <b>Paediatric:</b> <b>Cardiac arrest:</b> 0.01 mg/Kg (10 mcg/Kg) (0.1 mL/Kg of 1:10,000) IV/IO. (Repeat every 3-5 mins). <b>Bradycardia:</b> 0.01 mg/Kg (10 mcg/Kg) (0.1 mL/Kg of 1:10,000) IV/IO (Repeat every 3-5 mins).
Pharmacology / Action	<b>Alpha and beta adrenergic stimulant:</b> Increases heart rate – Chronotropic effect. Increases myocardial contractions – Inotropic effect. Increases BP. Increases electrical activity in the myocardium. Increases cerebral and coronary blood flow. Dilation of bronchioles.
Side effects	<b>In non-cardiac arrest patients:</b> Palpitations / Tachyarrhythmias / Hypertension.
Additional Information	<b>N.B.</b> Double check concentrations on pack before use.

## APPENDIX 1 – Medication Formulary

Clinical level:    

<b>Medication</b>	<b>Epinephrine (1:1,000)</b>
<b>Class</b>	Sympathetic agonist.
<b>Descriptions</b>	Naturally occurring catecholamine. It is a potent alpha and beta adrenergic stimulant; however, its effect on beta receptors is more profound.
<b>Presentation</b>	Pre-filled syringe, ampoule or Auto injector (for EMT use). 1 mg/1 mL (1:1,000).
<b>Administration</b>	Intramuscular (IM), Intravenous (IV) and nebulisation (Neb). ( <b>CPG:</b> 2/3.4.15, 2/3.7.31, 5/6.4.7, 4/5/6.4.11, 4/5/6.4.15, 4/5/6.7.13, 4/5/6.7.31).
<b>Indications</b>	Severe anaphylaxis, Stridor, Symptomatic Bradycardia and Cardiogenic shock.
<b>Contra-Indications</b>	None known.
<b>Usual Dosages</b>	<p><b>Anaphylaxis Adult:</b> 0.5 mg (500 mcg) IM (0.5 mL of 1:1,000). <b>EFR</b> assist patient - 0.3 mg (Auto injector) (Repeat every 5 minutes prn).</p> <p><b>Anaphylaxis Paediatric:</b>                      &lt; 6 months: - 0.05 mg (50 mcg) IM (0.05 mL of 1:1,000)                      6 months to 5 years: - 0.125 mg (125 mcg) IM (0.13 mL of 1:1,000)                      6 to 8 years: - 0.25 mg (250 mcg) IM (0.25 mL of 1:1,000)                      &gt; 8 years: - 0.5 mg (500 mcg) IM (0.5 mL of 1:1,000)</p> <p><b>EFR</b> assist patient -                      6 Months &lt; 10 years: 0.15 mg (Auto injector) (repeat every 5 minutes prn).                      ≥ 10 years: 0.3 mg (Auto injector) (repeat every 5 minutes prn).</p> <p><b>Stridor (AP):</b>                      &lt; 1 Year: 2.5 mg NEB                      ≥ 1 year: 5 mg NEB                      (repeat after 30 minutes prn) (AP).</p> <p><b>Adult (AP): Symptomatic Bradycardia/Cardiogenic shock:</b> 0.01 mg IV/IO repeat prn.                      (Dilute 1 mg Epinephrine in 100 mL NaCl and draw up in 1 mL syringe, administer the dose over 1 minute).</p>
<b>Pharmacology / Action</b>	<p><b>Alpha and beta adrenergic stimulant:</b>                      Reversal of laryngeal oedema and bronchospasm in anaphylaxis.                      Antagonises the effects of histamine.</p>
<b>Side effects</b>	Palpitations / Tachyarrhythmias / Hypertension / Angina-like symptoms.
<b>Additional information</b>	<b>N.B.</b> Double check the concentration on pack before use.

## APPENDIX 1 – Medication Formulary

Clinical level:

AP

Medication	Fentanyl
Class	Narcotic analgesic.
Descriptions	Synthetic narcotic analgesic with a rapid onset and short duration of action. It has a half-life of 6.5 minutes when IN route is used.
Presentation	Ampoule 100 micrograms in 2 mL (0.1 mg in 2 mL).
Administration	Intranasal (IN). Intravenous (IV). (CPG: 4/5/6.2.6, 4/5/6.7.5).
Indications	Acute severe pain.
Contra-Indications	< 1-year-old / Known Fentanyl hypersensitivity / ALoC / Bilateral occluded nasal passage / Nasal trauma / Epistaxis / Hypovolaemia.
Usual Dosages	<b>Adult:</b> 0.1 mg (100 mcg) IN (Repeat by one at not < 10 minutes if severe pain persists). 0.05 mg (50 mcg) IV  <b>Paediatric:</b> 0.0015 mg/Kg (1.5 mcg/Kg) IN. (Repeat by one at not < 10 minutes if severe pain persists).
Pharmacology / Action	Fentanyl provides some of the effects typical of other opioids through its agonism of the opioid receptors. Its strong potency in relation to that of Morphine is largely due to its high lipophilicity. Because of this, it can more easily penetrate the CNS. Fentanyl binds to $\mu$ -opioid G-protein-coupled receptors, which inhibit pain neurotransmitter release by decreasing intracellular $Ca^{2+}$ levels.
Side effects	Sedation / Nausea.
Long term side effects	Vomiting / Respiratory depression.
Additional information	<b>Caution if patient has transdermal Fentanyl patch:</b> Include an additional 0.1 mL, to allow for dead space in the mucosal atomisation device (MAD), in the calculated volume required. Administer 50% volume in each nostril if more than 1 mL. Following Fentanyl IN, the next dose may be either Fentanyl or Morphine IV, but not both. (Adults) In the absence of acquiring IV access, a second dose of IN Fentanyl may be administered. Controlled under Schedule 2 of the Misuse of Drugs Regulations 1988 (S.I. No. 328 of 1988).



## APPENDIX 1 – Medication Formulary

Clinical level:

**AP**

Medication	<b>Furosemide injection</b>
<b>Class</b>	Diuretic.
<b>Descriptions</b>	A loop diuretic.
<b>Presentation</b>	Ampoule 10 mg per mL. 2 mL, 5 mL and 25 mL per ampoule.
<b>Administration</b>	Intravenous (IV). ( <i>CPG</i> : 5/6.3.5).
<b>Indications</b>	Pulmonary oedema.
<b>Contra-Indications</b>	Pregnancy / Known Hypokalaemia Known severe adverse reaction.
<b>Usual Dosages</b>	<b>Adult:</b> 40 mg slow IV.  <b>Paediatric:</b> Not indicated.
<b>Pharmacology / Action</b>	Acts on the ascending loop of Henle by inhibiting the reabsorption of chloride and sodium ions into the interstitial fluid. This results in a relative hypertonic state. Water is therefore retained in the loop and eliminated via the bladder. It also causes venodilation which reduces venous return to the heart.
<b>Side effects</b>	Headache / Dizziness / Hypotension / Arrhythmias / Transient deafness / Diarrhoea / Nausea and Vomiting.
<b>Long term side effects</b>	Hyperuricaemia / Gout / Hypokalaemia / Hyperglycaemia.
<b>Additional information</b>	Furosemide should be protected from light. SPC recommends administration at 4 mg/min IV.

## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Glucagon
Class	Hormone and Antihypoglycaemic.
Descriptions	Glucagon is a protein secreted by the alpha cells of the Islets of Langerhans in the pancreas. It is used to increase the blood glucose level in cases of hypoglycaemia in which an IV cannot be immediately placed.
Presentation	1 mg vial powder and solution for reconstitution (1 mL).
Administration	Intramuscular (IM). ( <i>CPG</i> : 4/5/6.4.19, 4/5/6.7.32).
Indications	Hypoglycaemia in patients unable to take oral glucose or unable to gain IV access, with a blood glucose level < 4 mmol/L.
Contra-Indications	Known severe adverse reaction / Pheochromocytoma.
Usual Dosages	<b>Adult:</b> 1 mg IM.  <b>Paediatric:</b> ≤ 8 years - 0.5 mg (500 mcg) IM. > 8 years - 1 mg IM.
Pharmacology / Action	<b>Glycogenolysis:</b> Increases plasma glucose by mobilising glycogen stored in the liver.
Side effects	Rare, may cause Hypotension / Dizziness / Headache / Nausea and Vomiting.
Additional information	May be ineffective in patients with low stored glycogen e.g. prior use in previous 24 hours, alcohol dependent patients with liver disease. Store in refrigerator. Protect from light. Hypoglycaemic paediatric patients who are not diagnosed as diabetic should not be administered Glucagon (this does not preclude the administration of Glucose gel or Dextrose to treat hypoglycaemia).

## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Glucose gel
<b>Class</b>	Antihypoglycaemic.
<b>Descriptions</b>	Synthetic glucose paste.
<b>Presentation</b>	Glucose gel in a tube or sachet.
<b>Administration</b>	Buccal administration: Administer gel to the inside of the patient's cheek and gently massage the outside of the cheek. ( <b>CPG:</b> 2/3.4.19, 4/5/6.4.19, 4/5/6.7.32).
<b>Indications</b>	Hypoglycaemia. Blood glucose < 4 mmol/L. <b>EFR</b> - Known diabetic with confusion or altered levels of consciousness.
<b>Contra-Indications</b>	Known severe adverse reaction.
<b>Usual Dosages</b>	<b>Adult:</b> 10 – 20 g buccal (repeat prn).  <b>Paediatric:</b> ≤ 8 years: 5 – 10 g buccal (repeat prn). > 8 years: 10 – 20 g buccal (repeat prn).
<b>Pharmacology / Action</b>	Increases blood glucose levels.
<b>Side effects</b>	May cause vomiting in patients under the age of 5 years if administered too quickly.
<b>Additional information</b>	Glucose gel will maintain glucose levels once raised but should be used secondary to Dextrose to reverse hypoglycaemia. <b>Proceed with caution:</b> Patients with airway compromise. Altered level of consciousness.

## APPENDIX 1 – Medication Formulary

Clinical level:    

Medication	<b>Glyceryl trinitrate (GTN)</b>
Class	Nitrate.
Descriptions	Special preparation of Glyceryl trinitrate in an aerosol form that delivers precisely 0.4 mg of Glyceryl trinitrate per spray.
Presentation	<b>Aerosol spray:</b> Metered dose of 0.4 mg (400 mcg).
Administration	<p><b>Sublingual:</b></p> <p>Hold the pump spray vertically with the valve head uppermost.</p> <p>Place as close to the mouth as possible and spray under the tongue.</p> <p>The mouth should be closed after each dose.</p> <p>(<b>CPG:</b> 5/6.3.5, 5/6.4.10, 4.4.10, 1/2/3.4.10).</p>
Indications	<p>Angina / suspected myocardial infarction (MI).</p> <p><b>EMT:</b> Angina / suspected myocardial infarction (MI) with systolic BP <math>\geq</math> 110 mmHg.</p> <p><b>EFR:</b> may assist with administration.</p> <p><b>Advanced Paramedics and Paramedics</b> - Pulmonary oedema.</p>
Contra-Indications	SBP < 90 mmHg / Viagra or other phosphodiesterase type 5 inhibitors (Sildenafil, Tadalafil and Vardenafil) used within previous 24 hours / Severe mitral stenosis / Known severe adverse reaction.
Usual Dosages	<p><b>Adult:</b></p> <p><b>Angina or MI:</b> 0.4 mg (400 mcg) sublingual.</p> <p>(Repeat at 3-5 min intervals, Max: 1.2 mg).</p> <p><b>EFR:</b> assist administration - 0.4 mg sublingual max.</p> <p><b>Pulmonary oedema:</b> 0.8 mg (800 mcg) sublingual (repeat x 1 prn) (P &amp; AP).</p> <p><b>Paediatric:</b> Not indicated.</p>
Pharmacology / Action	<p><b>Vasodilator:</b></p> <p>Releases nitric oxide which acts as a vasodilator. Dilates coronary arteries particularly if in spasm increasing blood flow to myocardium.</p> <p>Dilates systemic veins reducing venous return to the heart (pre-load) and thus reduces the heart's workload.</p> <p>Reduces BP.</p>
Side effects	Headache / Transient Hypotension / Flushing / Dizziness.
Additional information	<p>Caution with inferior wall MI with right ventricular involvement as this may lead to profound hypotension.</p> <p>If the pump is new or it has not been used for a week or more the first spray should be released into the air.</p>

## APPENDIX 1 - Medication Formulary

Clinical level:

**AP**

Medication	<b>Glycopyrronium Bromide</b>
Class	Antimuscarinics.
Descriptions	Glycopyrronium Bromide is a quaternary ammonium antimuscarinic with peripheral effects similar to those of Atropine.
Presentation	Ampule 200 mcg/mL.
Administration	Subcutaneous (SC). ( <i>CPG</i> : 5/6.8.7).
Indications	Palliative care with excessive oropharyngeal secretions.
Contra-Indications	Known severe adverse reaction.
Usual Dosages	<b>Adult:</b> 0.4 mg (400 mcg) SC. <b>Paediatric:</b> Not applicable.
Pharmacology / Action	It inhibits the action of acetylcholine on structures innervated by postganglionic cholinergic nerves and on smooth muscles that respond to acetylcholine but lack cholinergic innervation.
Side effects	Transient bradycardia / Pupil dilation / Photophobia / Flushing.
Additional information	For patients receiving palliative care administer their doctor's prescribed dose if known.

## APPENDIX 1 – Medication Formulary

Clinical level:

AP

<b>Medication</b>	<b>Haloperidol</b>
<b>Class</b>	Antipsychotic.
<b>Descriptions</b>	A class of antipsychotic medication used especially in the treatment of schizophrenia.
<b>Presentation</b>	Ampule 5 mg/mL. Capsule 0.5 mg (PO).
<b>Administration</b>	Subcutaneous (SC). Oral (PO). ( <b>CPG:</b> 5/6.8.7).
<b>Indications</b>	Palliative care with nausea and vomiting or agitation/delirium.
<b>Contra-Indications</b>	Known severe adverse reaction.
<b>Usual Dosages</b>	<b>Adult:</b> 1 – 2 mg SC/PO.  <b>Paediatric:</b> Not applicable.
<b>Pharmacology / Action</b>	Haloperidol is metabolised by several routes, including glucuroniation and cytochrome P450 enzyme system (particularly CYP 3A4 or CYP 2D6). As a direct consequence of the central dopamine blocking effect, Haloperidol has an incisive activity on delusion and hallucinations and an activity on the basal ganglia.
<b>Side effects</b>	Insomnia / Agitation / Hyperkinesia / Headache.
<b>Additional information</b>	For agitation/delirium, consider Midazolam in addition only if severe agitation. For patients receiving palliative care administer their doctor's prescribed dose if known.

## APPENDIX 1 – Medication Formulary

Clinical level:  

Medication	Hartmann's Solution
<b>Class</b>	Isotonic crystalloid solution.
<b>Descriptions</b>	Hartmann's Solution is an isotonic crystalloid solution containing Sodium Chloride 0.6%, Sodium Lactate 0.25%, Potassium Chloride 0.04%, Calcium Chloride 0.027%.
<b>Presentation</b>	Soft pack for infusion 500 mL & 1000 mL.
<b>Administration</b>	Intravenous (IV) infusion. Intraosseous (IO) infusion.  <b>Paramedic:</b> Maintain infusion once commenced.
<b>Indications</b>	When NaCl is unavailable it may be substituted with Hartmann's Solution IV/IO, except for crush injuries, burns, renal failure and hyperglycaemia.
<b>Contra-Indications</b>	Known severe adverse reaction. Do not use with Ceftriaxone.
<b>Usual Dosages</b>	<b>Adult:</b> See NaCl.  <b>Paediatric:</b> See NaCl.
<b>Pharmacology / Action</b>	Increases extracellular volume.
<b>Side effects</b>	If administered in large amounts may cause oedema.
<b>Additional information</b>	Observe caution with patients with history of heart failure. <b>Also called:</b> Sodium Lactate Intravenous Solution or Compound Ringer Lactate Solution for injection. Warm fluids prior to administration if possible.

## APPENDIX 1 - Medication Formulary

Clinical level:



Medication	Hydrocortisone
Class	Corticosteroid and anti-inflammatory.
Descriptions	Hydrocortisone is a potent corticosteroid with anti-inflammatory properties.
Presentation	Powder and solvent for solution for injection or infusion. Vial containing off-white powder and vial containing water for injections. Prepare the solution aseptically by adding not more than 2 mL of sterile water for injections to the contents of one 100 mg vial, shake and withdraw for use.
Administration	Intravenous (IV infusion). Intramuscular (IM). The preferred route for initial emergency use is intravenous. (CPG: 4/5/6.3.3, 4/5/6.3.4, 5/6.4.13, 4/5/6.4.15, 4/5/6.7.12, 5/6.7.30, 4/5/6.7.31).
Indications	Severe or recurrent anaphylactic reactions. Asthma refractory to Salbutamol and Ipratropium Bromide. Exacerbation of COPD (AP). Adrenal insufficiency (P).
Contra-Indications	No major contraindications in acute management of anaphylaxis.
Usual Dosages	<b>Adult:</b> <b>Anaphylactic reaction:</b> (AP) 200 mg IV (infusion in 100 mL NaCl) or IM injection (P/AP). <b>Exacerbation of COPD:</b> 200 mg IV (infusion in 100 mL NaCl) or IM (AP). <b>Asthma:</b> 100 mg slow IV (infusion in 100 mL NaCl) (AP). <b>Adrenal insufficiency:</b> (AP) 100 mg IV (infusion in 100 mL NaCl) or IM (P/AP). <b>Paediatric:</b> <b>Anaphylactic reaction:</b> < 1 year: (AP) - 25 mg IV (infusion in 100 mL NaCl) or IM (P/AP). 1 to 5 years: (AP) - 50 mg IV (infusion in 100 mL NaCl) or IM (P/AP). > 5 years: (AP) - 100 mg IV (infusion in 100 mL NaCl) or IM (P/AP). <b>Asthma:</b> (AP) < 1 year: 25 mg IV / 1 to 5 years: 50 mg IV / > 5 years: 100 mg IV - (infusion in 100 mL NaCl). <b>Adrenal insufficiency:</b> 6 months to ≤ 5 years: (AP) 50 mg IV (infusion in 100 mL NaCl) or IM injection (P/AP). > 5 years: (AP) 100 mg IV (infusion in 100 mL NaCl) or IM injection (P/AP).
Pharmacology / Action	Potent anti-inflammatory properties and inhibits many substances that cause inflammation.
Side effects	CCF / Hypertension / Abdominal distension / Vertigo / Headache / Nausea / Malaise and hiccups.
Long term side effects	Adrenal cortical atrophy develops during prolonged therapy and may persist for months after stopping treatment.
Additional information	Intramuscular injection should avoid the deltoid area because of the possibility of tissue atrophy. Dose should not be less than 25 mg. IV is the preferred route for adrenal crisis.



## APPENDIX 1 – Medication Formulary

Clinical level:

**AP**

Medication	Hyoscine Butylbromide
Class	Antimuscarinics.
Descriptions	Hyoscine Butylbromide is an antispasmodic agent.
Presentation	Ampule 20 mg/mL.
Administration	Subcutaneous (SC). (CPG: 5/6.8.7).
Indications	Palliative care with excessive oropharyngeal secretions.
Contra-Indications	Known severe adverse reaction.
Usual Dosages	<b>Adult:</b> 10 – 20 mg SC. <b>Paediatric:</b> Not applicable.
Pharmacology / Action	It is believed to act predominantly on the intramural parasympathetic ganglia of the abdominal and pelvic cavity organs.
Side effects	Transient bradycardia / Pupil dilation / Photophobia / Flushing.
Additional information	For patients receiving palliative care administer their doctor's prescribed dose if known.

## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Ibuprofen
Class	Non-Steroidal Anti-Inflammatory Drugs (NSAIDs).
Descriptions	It is an anti-inflammatory analgesic.
Presentation	Suspension 100 mg in 5 mL and 200 mg in 5 mL. 200 mg, 400 mg tablets.
Administration	Orally (PO). ( <b>CPG:</b> 4/5/6.2.6, 4/5/6.7.5).
Indications	Mild to moderate pain.
Contra-Indications	Not suitable for children under 3 months / Patient with history of asthma exacerbated by Aspirin / Pregnancy / Peptic ulcer disease / Known renal failure / Known severe liver failure / Known severe heart failure / Concurrent NSAID use (e.g. Diclofenac, Naproxen) / Known severe adverse reaction.
Usual Dosages	<b>Adult:</b> 400 mg PO (Mild pain). 600 mg PO (Moderate pain).  <b>Paediatric:</b> 10 mg/Kg PO.
Pharmacology / Action	Suppresses prostaglandins, which cause pain via the inhibition of cyclooxygenase (COX). Prostaglandins are released by cell damage and inflammation.
Side effects	Skin rashes / Gastrointestinal intolerance and bleeding.
Long term side effects	Occasional gastrointestinal bleeding and ulceration can occur. May also cause acute renal failure / Interstitial nephritis / NSAID-associated nephropathy.
Additional information	If Ibuprofen administered in previous 6 hours, adjust the dose downward by the amount given by other sources resulting in a maximum of 10 mg/Kg. Caution with significant burns or poor perfusion due to risk of kidney failure. Caution if on oral anticoagulant (e.g. Warfarin, Rivaroxaban, Apixaban, Edoxaban) due to increased bleeding risk. Ibuprofen may be combined with Paracetamol for synergic effect.

## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	<b>Ipratropium Bromide</b>
Class	Anticholinergic.
Descriptions	It is a parasympatholytic bronchodilator that is chemically related to Atropine.
Presentation	Nebuliser Solution 0.25 mg (250 mcg) in 1 mL.
Administration	Nebulised (NEB) mixed with age specific dose of Salbutamol. ( <b>CPG:</b> 4/5/6.3.3, 4/5/6.3.4, 4/5/6.7.12).
Indications	Acute moderate asthma or exacerbation of COPD not responding to initial Salbutamol dose.
Contra-Indications	Known severe adverse reaction.
Usual Dosages	<b>Adult:</b> 0.5 mg (500 mcg) NEB.  <b>Paediatric:</b> < 12 years: 0.25 mg (250 mcg) NEB. ≥ 12 years: 0.5 mg (500 mcg) NEB.
Pharmacology / Action	It blocks muscarinic receptors associated with parasympathetic stimulation of the bronchial air passageways. This results in bronchial dilation and reduced bronchial secretions.
Side effects	Transient dry mouth / Blurred vision / Tachycardia / Headache.

## APPENDIX 1 – Medication Formulary

Clinical level:

**AP**

Medication	Ketamine
<b>Class</b>	Ketamine is a dissociative anaesthetic agent with analgesic properties.
<b>Descriptions</b>	Ketamine acts as an <i>N</i> -methyl-D-aspartate (NMDA) receptor noncompetitive antagonist. Combined with Morphine, Ketamine demonstrates beneficial effects in trauma patients with severe acute pain.
<b>Presentation</b>	White crystalline powder or clear liquid. Ampoule 200 mg in 20 mL (draw up 1 mL and dilute in 9 mL of NaCl).
<b>Administration</b>	Intravenous (IV). ( <i>CPG</i> : 4/5/6.2.6, 4/5/6.7.5).
<b>Indications</b>	<b>Adult:</b> Severe pain.  <b>Paediatric:</b> Severe pain.
<b>Contra-Indications</b>	Acute porphyrias / Pre-eclampsia / Eclampsia / Head trauma / Hypertension / Raised intracranial pressure / Severe cardiac disease / Stroke.
<b>Usual Dosages</b>	<b>Adult:</b> 0.1 mg/Kg IV (repeat once only at not < 10 minutes prn).  <b>Paediatric:</b> 0.1 mg/Kg IV (repeat once only at not < 10 minutes prn).
<b>Pharmacology / Action</b>	Induces sedation, immobility amnesia, and marked analgesia.
<b>Side effects</b>	Diplopia / Hallucinations / Hypertension / Nausea and Vomiting / Tachycardia / Transient psychotic effects.  <b>Uncommon:</b> Arrhythmias / Bradycardia / Hypotension / Laryngospasm / Respiratory depression.
<b>Additional information</b>	Incidents of hallucinations, nightmares, and other psychotic effects can be reduced by a Benzodiazepine such as Diazepam or Midazolam. Reduces Morphine requirements. Has low frequency of serious side effects in doses used for analgesia. Allows patients to maintain their pharyngeal reflexes and maintain their own airway. Controlled under Schedule 3 to the Misuse of Drugs Regulations 1988 (S.I. No. 328 of 1988).

## APPENDIX 1 – Medication Formulary

Clinical level:

AP

Medication	Lidocaine
Class	Antiarrhythmic.
Descriptions	Ventricular antiarrhythmic agent.
Presentation	Lidocaine injection Mini jet 1% w/v 100 mg per 10 mL.
Administration	Intravenous (IV). Intraosseous (IO). ( <b>CPG:</b> 5/6.4.3, 4/5/6.7.22).
Indications	When Amiodarone is unavailable it may be substituted with Lidocaine for VF/pVT arrests - ( <i>Special authorisation required</i> ).
Contra-Indications	No contraindications for cardiac arrest.
Usual Dosages	<b>Adult:</b> 100 mg IV. <b>Paediatric:</b> 1-1.5 mg/Kg IV.
Pharmacology / Action	Reduces automaticity by decreasing the rate of diastolic depolarisation. Stabilises the neuronal membrane and prevents the initiation and transmission of nerve impulses, action is rapid and blockade may last up to 2 hours.
Side effects	Drowsiness / Dizziness / Twitching / Paraesthesia / Convulsions / Bradycardia / Respiratory depression.
Additional information	Lidocaine may not be administered if Amiodarone has been administered.

## APPENDIX 1 - Medication Formulary

Clinical level:

**AP**

Medication	<b>Lorazepam</b>
<b>Class</b>	Benzodiazepine.
<b>Descriptions</b>	It is an anxiolytic used as a sedative.
<b>Presentation</b>	1 mg tablet.
<b>Administration</b>	Orally (PO).  ( <i>CPG</i> : 4/5/6.4.30).
<b>Indications</b>	Combative with hallucinations or paranoia and risk to self or others.
<b>Contra-Indications</b>	History of sensitivity to Benzodiazepines / Severe hepatic or pulmonary insufficiency / Suspected significant alcohol and/or sedatives ingested / Known severe adverse reaction.
<b>Usual Dosages</b>	<b>Adults:</b> 2 mg PO (repeat x 1prn).  <b>Paediatric:</b> Not indicated.
<b>Pharmacology / Action</b>	Acts on CNS receptors to potentiate the inhibitory action of GABA.
<b>Side effects</b>	Drowsiness / Confusion / Headache / Dizziness / Blurred vision / Nausea and Vomiting.  <b>On rare occasions:</b> Hypotension / Hypertension.

## APPENDIX 1 – Medication Formulary

Clinical level:

**AP**

Medication	<b>Magnesium Sulphate injection</b>
Class	Electrolyte and Tocolytic agent.
Descriptions	It is a salt that is an essential element in numerous biochemical reactions that occur within the body.
Presentation	Ampoule 5 g in 10 mL.
Administration	Intravenous (IV). Intraosseous (IO). ( <i>CPG</i> : 4/5/6.3.4, 5/6.4.12, 5/6.4.23).
Indications	Life-threatening Asthma / Torsades de pointes / Persistent bronchospasm / Seizure associated with eclampsia.
Contra-Indications	None in cardiac arrest. Known severe adverse reaction.
Usual Dosages	<p><b>Adults:</b></p> <p><b>Life-threatening Asthma:</b></p> <p>2 g IV (infusion in 100 mL NaCl) given over 20 minutes.</p> <p><b>Tachycardia – Irregular: Torsades de pointes with a pulse:</b></p> <p>2 g IV (infusion in 100mL NaCl) given over 10 - 15 minutes.</p> <p><b>Persistent bronchospasm:</b></p> <p>2 g IV (infusion in 100 mL NaCl) given over 20 minutes.</p> <p><b>Seizure associated with pre-eclampsia:</b></p> <p>4 g IV (infusion in 100 mL NaCl) given over 15 minutes.</p> <p><b>Paediatric:</b></p> <p>Not indicated.</p>
Pharmacology / Action	It acts as a physiological calcium channel blocker and blocks neuromuscular transmission.
Side effects	Bradycardia can occur during administration; this can be minimised by slowing the rate of infusion.  Arrhythmias / Coma / Confusion / Drowsiness / Flushing of skin / Hypotension / Decreased deep tendon reflexes / Muscle weakness / Nausea / Respiratory depression / Thirst / Vomiting.
Additional Information	5 g in 10 mL is equivalent to 20 mmol/mg.

## APPENDIX 1 – Medication Formulary

Clinical Level:



Medication	<b>Methoxyflurane</b>
<b>Class</b>	Volatile anaesthetic agent.
<b>Descriptions</b>	Clear, almost colourless, volatile liquid, with a characteristic fruity odour that becomes a vapour or gas when used with the single use inhaler.
<b>Presentation</b>	3 mL vial with a tear off tamper-evident seal.
<b>Administration</b>	Inhaled (INH) through an activated Carbon Chamber (self-administered). ( <i>CPG</i> : 4/5/6.2.6, 4/5/6.7.5).
<b>Indications</b>	<b>Adult:</b> Moderate to severe pain. <b>Paediatric:</b> Moderate to severe pain.
<b>Contra-Indications</b>	< 5 years old Altered LOC due to head injury, drugs or alcohol. Cardiovascular instability / Respiratory depression. Known severe adverse reaction.
<b>Usual Dosages</b>	<b>Adult:</b> 3 mL (INH) (repeat x 1 only prn). <b>Paediatric:</b> 3 mL (INH) (repeat x 1 only prn).
<b>Pharmacology / Action</b>	Methoxyflurane vapour provides analgesia when inhaled at low concentrations. Methoxyflurane perturbs membrane fluidity and alters the activity of many ion channels and receptors required for cell-cell signalling across gap junctions and which underlie the action potential.
<b>Side effects</b>	Amnesia / Anxiety / Depression / Dizziness / Dysarthria / Dysgeusia / Euphoria / Headache / Sensory neuropathy / Somnolence / Hypotension / Coughing / Dry mouth / Nausea / Feeling drunk / Sweating. <b>Uncommon:</b> Tingling or numbness to hands and feet / Tiredness / Mouth discomfort.
<b>Additional information</b>	Patients with pain due to acute coronary syndrome (ACS) or migraine may not be suitable for Methoxyflurane. Methoxyflurane crosses the placenta. Consider the risk of central nervous system (CNS) and respiratory depression in an already compromised foetus. <b>Do not</b> use in patients with renal impairment or renal failure. Contains butylated hydroxytoluene (E321) as a stabiliser. Methoxyflurane has a mildly pungent odour. If used in a confined space request the patient to inhale and exhale through the inhaler tube while ensuring that the activated Carbon Chamber is attached.



## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Midazolam Solution
Class	Benzodiazepine.
Descriptions	It is a potent sedative agent. Clinical experience has shown Midazolam to be 3 to 4 times more potent per mg as Diazepam.
Presentation	<p><b>Ampoule:</b> 10 mg in 2 mL or 10 mg in 5 mL.</p> <p><b>Pre-filled syringe:</b> 2.5 mg in 0.5 mL / 5 mg in 1 mL / 7.5 mg in 1.5 mL / 10 mg in 1 mL / 10 mg in 2 mL.</p> <p><b>Buccal liquid:</b> 50 mg in 5 mL.</p>
Administration	<p>Buccal / IN / IM / IV / IO.</p> <p>Intranasal (IN) (50% in each nostril).</p> <p>(<b>CPG:</b> 5/6.4.23, 4/5/6.4.30, 5/6.7.33, 5/6.8.7).</p>
Indications	Seizures / Combative with hallucinations or paranoia and risk to self or others / Sedation (following medical advice).
Contra-Indications	Shock / Respiratory depression / KSAR / Depressed vital signs or alcohol-related altered level of consciousness.
Usual Dosages	<p><b>Adult:</b></p> <p><b>Seizure:</b> 10 mg buccal, 5 mg IN or 5 mg IM (P/AP) 2.5 mg IV/IO (AP)</p> <p><b>Palliative Care:</b> 2.5 mg SC (AP) <i>Alternatively</i> 2.5 - 5 mg buccal (P/AP) repeat x 1 prn.</p> <p><b>Paediatric:</b></p> <p><b>Seizure:</b> &lt; 1 year: - 2.5 mg buccal 1 year to &lt; 5 years: - 5 mg buccal 5 years to &lt; 10 years: - 7.5 mg buccal ≥ 10 years: - 10 mg buccal Or 0.2 mg/Kg intranasal (P &amp; AP) or 0.1 mg/Kg IV/IO (AP)</p> <p>Maximum 4 doses of Benzodiazepine for adult and paediatric seizing patients regardless of route.</p> <p><b>Behavioural Emergency:</b> AP - Seek medical advice regarding sedation.</p> <p><b>Adults:</b> 5 mg IN/IM - (repeat x 2 prn) (AP).</p> <p><b>Paediatric:</b> 0.1 mg/Kg IN - (repeat x 2 prn) (AP).</p>
Pharmacology / Action	It affects the activity of a chemical that transmits impulses across nerve synapses called Gamma-AminoButyric Acid (GABA). GABA is an inhibitory neurotransmitter. Midazolam works by increasing the effects of GABA at these receptors.
Side effects	Respiratory depression / Headache / Hypotension / Drowsiness.
Additional information	<p>Midazolam IV should be titrated to effect.</p> <p>Ensure Oxygen and resuscitation equipment are available prior to administration.</p> <p>Practitioners should take into account the dose administered by carers prior to arrival of practitioner.</p> <p>Contraindications, other than KSAR, refer to non-seizing patients.</p> <p>If patient recommences seizing regard it as a new event, administer additional dose then consider medical advice (AP).</p>

## APPENDIX 1 - Medication Formulary

Clinical level:

**AP**

Medication	Morphine Sulphate
<b>Class</b>	Narcotic analgesic.
<b>Descriptions</b>	CNS depressant and a potent analgesic with haemodynamic properties that make it extremely useful in emergency medicine.
<b>Presentation</b>	Ampoule 10 mg in 1 mL (dilute in 9 mL of NaCl). Oral Suspension 10 mg in 5 mL.
<b>Administration</b>	IV / IO / PO / IM. ( <i>CPG</i> : 4/5/6.2.6, 4/5/6.7.5, 5/6.8.7).
<b>Indications</b>	<b>Adult:</b> Severe pain. <b>Paediatric:</b> Severe pain.
<b>Contra-Indications</b>	PO < 1-year-old / Labour pains / Acute respiratory depression / Acute intoxication / Systolic BP < 90 mmHg / Known severe adverse reaction.
<b>Usual Dosages</b>	<b>Adult:</b> 4 mg IV - initial dose. Repeat Morphine 2 mg at not < 2 min intervals prn (Max 16 mg). For musculoskeletal pain Max 20 mg. Up to 10 mg IM (if no cardiac chest pain and no IV access). <b>Palliative Care:</b> 2.5 - 5 mg SC (repeat x 1 prn) <i>Alternatively</i> 5 - 10 mg PO (repeat x 1 prn). <b>Paediatric:</b> 0.3 mg/Kg (300 mcg/Kg) PO (Max 10 mg). 0.05 mg/Kg (50 mcg/Kg) IV/IO. Repeat at not < 2 min prn to Max of 0.1 mg/Kg IV/IO.
<b>Pharmacology / Action</b>	<b>Opiate Analgesic:</b> Acts on Central Nervous System to reduce pain and anxiety. Vasodilatation resulting in reduced pre-load to myocardium.
<b>Side effects</b>	Respiratory depression / Drowsiness / Nausea and vomiting / Constipation.
<b>Long term side effects</b>	Long term use may lead to dependence.
<b>Additional information</b>	Use with extreme caution particularly with elderly/young. Caution with acute respiratory distress. Caution with reduced GCS. Not recommended for headache. <b>N.B.</b> Controlled under Schedule 2 of the Misuse of Drugs Regulations 1988 (SI. no 328).

## APPENDIX 1 – Medication Formulary

Clinical Level:   

Medication	Naloxone
Class	Narcotic antagonist.
Descriptions	Effective in management and reversal of overdoses caused by narcotics or synthetic narcotic agents.
Presentation	Ampoules 0.4 mg in 1 mL (400 mcg /1 mL) or pre-loaded syringe.
Administration	IV / IO / IM / SC / IN.  ( <b>CPG:</b> 5/6.4.7, 4/5.4.22, 6.4.22, 5/6.5.2, 4/5/6.7.11).
Indications	Inadequate respiration and/or ALoC following known or suspected narcotic overdose.
Contra-Indications	Known severe adverse reaction.
Usual Dosages	<b>Adult:</b> 0.4 mg (400 mcg) IV/IO (AP) (repeat after 3 min prn to a Max dose of 2 mg). 0.4 mg (400 mcg) IM/SC (P) (repeat after 3 min prn to a Max dose of 2 mg). 0.8 mg (800 mcg) IN (EMT) (repeat x 1 after 3 min prn).  <b>Paediatric:</b> 0.01 mg/Kg (10 mcg/Kg) IV/IO (AP). 0.01 mg/Kg (10 mcg/Kg) IM/SC (P). 0.02 mg/Kg (20 mcg/Kg) IN (EMT). (Repeat dose prn to maintain opioid reversal to Max 0.1 mg/Kg or 2 mg).
Pharmacology / Action	<b>Narcotic antagonist:</b> Reverse the respiratory depression and analgesic effect of narcotics.
Side effects	Acute reversal of narcotic effect ranging from nausea and vomiting to agitation and seizures.
Additional information	Use with caution in pregnancy. Administer with caution to patients who have taken large dose of narcotics or are physically dependent. Rapid reversal will precipitate acute withdrawal syndrome. Prepare to deal with aggressive patients.

## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Nifedipine
Class	Tocolytic agent and calcium channel blocker.
Descriptions	Dihydropyridine calcium channel blocker.
Presentation	20 mg tablet.
Administration	PO. ( <b>CPG</b> : 4/5/6.5.5).
Indications	Prolapsed cord.
Contra-Indications	Hypotension. Known severe adverse reaction.
Usual Dosages	<b>Adults:</b> 20 mg PO.  <b>Paediatric:</b> Not indicated.
Pharmacology / Action	Inhibits muscle contraction by interfering with the movement of calcium ions through the slow channels of active cell membrane.
Side effects	Asthenia / Hypotension / Headache / Dizziness / Palpitation / Vasodilatation / Lethargy / Nausea and Vomiting
Additional information	Close monitoring of maternal pulse & BP is required and continuous foetal monitoring should be carried out if possible.

## APPENDIX 1 – Medication Formulary

Clinical Level:



Medication	Nitrous Oxide 50% and Oxygen 50% (Entonox®)
Class	Analgesic.
Descriptions	Potent analgesic gas contains a mixture of both Nitrous Oxide and Oxygen.
Presentation	Cylinder, coloured blue with white and blue triangles on cylinder shoulders. <b>Medical gas:</b> 50% Nitrous Oxide & 50% Oxygen.
Administration	Self-administered. Inhalation by demand valve with face-mask or mouthpiece. ( <b>CPG:</b> 4/5/6.2.6, 5/6.5.1, 5/6.5.6, 4/5/6.7.5).
Indications	Moderate to severe pain.
Contra-Indications	Altered level of consciousness / Chest Injury / Pneumothorax / Shock / Recent scuba dive / Decompression sickness / Intestinal obstruction / Inhalation Injury / Carbon monoxide (CO) poisoning / Known severe adverse reaction.
Usual Dosages	<b>Adult:</b> Self-administered until pain tolerable. <b>Paediatric:</b> Self-administered until pain tolerable.
Pharmacology / Action	<b>Analgesic agent gas:</b> CNS depressant. Pain relief.
Side effects	Disinhibition / Decreased level of consciousness / Light headedness.
Additional information	Do not use if patient unable to understand instructions. In cold temperatures warm cylinder and invert to ensure mix of gases. Advanced paramedics may use discretion with minor chest injuries. <b>Brand name:</b> Entonox®. Has an addictive property. Caution when using Entonox® for greater than one hour for sickle cell crisis.

## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Ondansetron
Class	Antiemetic.
Descriptions	Used in management of nausea and vomiting. Potent, highly selective 5 HT3 receptor-antagonist.
Presentation	Ampoule 2 mL (4 mg in 2 mL).
Administration	IM/IV. ( <b>CPG:</b> 5/6.4.26, 4/5/6.7.5).
Indications	Management, prevention and treatment of significant nausea and vomiting.
Contra-Indications	Known severe adverse reaction.
Usual Dosages	<b>Adult:</b> 4 mg slow IV or IM (AP/P).  <b>Paediatric:</b> 0.1 mg/Kg 0.1 mg/Kg slow IV or IM to a Max of 4 mg (AP).
Pharmacology / Action	Precise mode of action in the control of nausea and vomiting is not known.
Side effects	<b>General:</b> Flushing / Headache / Sensation of warmth/ Injection site reactions (rash, urticaria, itching).  <b>Uncommon:</b> Arrhythmias / Bradycardia / Hiccups / Hypotension / Seizures.
Additional information	Caution in patients with a known history or family history of cardiac conduction intervals (QT prolongation) or if patient has history of arrhythmias or electrolyte imbalance.

## APPENDIX 1 – Medication Formulary

Clinical Level:    

Medication	Oxygen
Class	Gas.
Descriptions	Odourless / Tasteless / Colourless gas necessary for life.
Presentation	<b>Medical gas:</b> D, E or F cylinders, coloured black with white shoulders. <b>CD cylinder:</b> White cylinder.
Administration	<b>Inhalation via:</b> High concentration reservoir (non-rebreather) mask / Simple face mask / Venturi mask / Tracheostomy mask / Nasal cannulae / CPAP device / Bag Valve Mask. <b>(CPG: Oxygen is used extensively throughout the CPGs).</b>
Indications	Absent / Inadequate ventilation following an acute medical or traumatic event. SpO <sub>2</sub> < 94% adults and < 96% paediatrics. SpO <sub>2</sub> < 92% for patients with acute exacerbation of COPD. SpO <sub>2</sub> < 90% for patients with acute onset of Pulmonary Oedema.
Contra-Indications	Bleomycin lung injury.
Usual Dosages	<b>Adult:</b> Cardiac and respiratory arrest or sickle cell crisis; 100%. Life threats identified during primary survey; 100% until a reliable SpO <sub>2</sub> measurement obtained then titrate O <sub>2</sub> to achieve SpO <sub>2</sub> of 94% - 98%. For patients with acute exacerbation of COPD, administer O <sub>2</sub> titrate to achieve SpO <sub>2</sub> 92% or as specified on COPD Oxygen Alert Card. All other acute medical and trauma titrate O <sub>2</sub> to achieve SpO <sub>2</sub> 94% - 98%. <b>Paediatric:</b> Cardiac and respiratory arrest or sickle cell crisis; 100%. Life threats identified during primary survey; 100% until a reliable SpO <sub>2</sub> measurement obtained then titrate O <sub>2</sub> to achieve SpO <sub>2</sub> of 96% - 98%. Neonatal resuscitation (< 4 weeks) consider supplemental O <sub>2</sub> (≤ 30%). All other acute medical and trauma titrate O <sub>2</sub> to achieve SpO <sub>2</sub> of 96% - 98%.
Pharmacology / Action	Oxygenation of tissue/organs.
Side effects	Prolonged use of O <sub>2</sub> with chronic COPD patients may lead to reduction in ventilation stimulus.
Additional information	A written record must be made of what oxygen therapy is given to every patient. Documentation recording oximetry measurements should state whether the patient is breathing air or a specified dose of supplemental Oxygen. Consider humidifier if oxygen therapy for paediatric patients is > 30 minutes duration. Caution with paraquat poisoning, administer Oxygen if SpO <sub>2</sub> < 92%. Avoid naked flames, powerful oxidising agent.

## APPENDIX 1 – Medication Formulary

Clinical Level:



Medication	<b>Oxytocin</b>
<b>Class</b>	Synthetic hormone.
<b>Descriptions</b>	Synthetic Oxytocin 5 international units per mL.
<b>Presentation</b>	5 international units in 1 mL ampoule.
<b>Administration</b>	IM. ( <b>CPG:</b> 4/5/6.5.4).
<b>Indications</b>	Control of post-partum haemorrhage.
<b>Contra-Indications</b>	Severe cardiac dysfunction / Known severe adverse reaction.
<b>Usual Dosages</b>	<b>Adult:</b> 5 international units IM.  <b>Paediatric:</b> Not indicated.
<b>Pharmacology / Action</b>	Causes rhythmic contraction of uterine smooth muscle, thereby constricting uterine blood vessels. It acts rapidly with a latency period of 2 to 4 minutes following IM injection. The oxytocic response lasts for 30 to 60 minutes.
<b>Side effects</b>	Cardiac arrhythmias / Headache / Nausea and vomiting / Hypotension / Abdominal pain / Dizziness.
<b>Additional information</b>	Ensure that a second foetus is not in the uterus prior to administration. Avoid rapid intravenous injection (may transiently reduce blood pressure). Store at 2 – 8°C, shelf life un-refrigerated; 3 months.




## APPENDIX 1 – Medication Formulary

Clinical Level:



Medication	Paracetamol												
Class	Analgesic and antipyretic.												
Descriptions	Paracetamol is used to reduce pain and body temperature.												
Presentation	Rectal suppository 1 g, 500 mg, 250 mg, 180 mg, 125 mg, 80 mg.  Suspension 120 mg in 5 mL or 250 mg in 5 mL.  500 mg tablet.  Glass vial, 1 g of Paracetamol in 100 mL solution for infusion.												
Administration	Per Rectum (PR). Orally (PO). IV infusion.  (CPG: 4/5/6.2.6, 4/5/6.4.24, 4/5/6.7.5, 5/6.7.34, 4/5/6.7.35, 5/6.8.7).												
Indications	<b>Adult:</b> Pyrexia - Temperature > 38.3°C / Minor to moderate pain.  <b>Paediatric:</b> Pyrexia - Temperature > 38.5°C / Minor to moderate pain.												
Contra-Indications	< 1 month old / Known severe adverse reaction / Chronic liver disease.												
Usual Dosages	<b>Adult:</b>  1 g PO (EMT, P/AP).  1 g IV infusion (AP), if estimated weight < 50 Kg, 15 mg/Kg.  <b>Palliative Care:</b> 1 g PO (Repeat x 1 prn).  <b>Paediatric:</b> <table><tr><td><b>PO</b> (EMT, P/AP)</td><td><b>PR</b> (AP)</td><td><b>IV Infusion</b> (AP)</td></tr><tr><td>20 mg/Kg PO</td><td>&gt;1 month &lt; 1 year - 90 mg PR</td><td>&lt; 1 year – 7.5 mg/Kg IV</td></tr><tr><td></td><td>1-3 years - 180 mg PR</td><td>≥ 1 year – 15 mg/Kg IV</td></tr><tr><td></td><td>4-8 years - 360 mg PR</td><td></td></tr></table>	<b>PO</b> (EMT, P/AP)	<b>PR</b> (AP)	<b>IV Infusion</b> (AP)	20 mg/Kg PO	>1 month < 1 year - 90 mg PR	< 1 year – 7.5 mg/Kg IV		1-3 years - 180 mg PR	≥ 1 year – 15 mg/Kg IV		4-8 years - 360 mg PR	
<b>PO</b> (EMT, P/AP)	<b>PR</b> (AP)	<b>IV Infusion</b> (AP)											
20 mg/Kg PO	>1 month < 1 year - 90 mg PR	< 1 year – 7.5 mg/Kg IV											
	1-3 years - 180 mg PR	≥ 1 year – 15 mg/Kg IV											
	4-8 years - 360 mg PR												
Pharmacology / Action	Analgesic – central prostaglandin inhibitor.  Antipyretic – prevents the hypothalamus from synthesising prostaglandin E, inhibiting the body temperature from rising further.												
Side effects	None.												
Long term side effects	Long term use at high dosage or over dosage can cause liver damage and less frequently renal damage.												
Additional information	<b>Note:</b>  Paracetamol is contained in Paracetamol suspension and other over the counter drugs. Consult with parent / guardian in relation to medication administration prior to arrival on scene.  For PR use be aware of the modesty of the patient, should be administered in the presence of a 2 <sup>nd</sup> person.  If Paracetamol administered in the previous 4 hours, adjust the dose downward by the amount given by other sources resulting in a maximum of 20 mg/Kg.												

## APPENDIX 1 – Medication Formulary

Clinical Level:    

Medication	Salbutamol
Class	Sympathetic agonist.
Descriptions	Sympathomimetic that is selective for beta-2 adrenergic receptors.
Presentation	Nebule 2.5 mg in 2.5 mL. Nebule 5 mg in 2.5 mL. <i>Aerosol inhaler</i> : Metered dose 0.1 mg (100 mcg).
Administration	NEB. Inhalation via aerosol inhaler. ( <b>CPG</b> : 4/5/6.3.3, 3.3.4, 4/5/6.3.4, 2/3.4.15, 4/5/6.4.15, 4/5/6.6.10, 4/5/6.7.12, 2/3.7.31, 4/5/6.7.31).
Indications	Bronchospasm / Exacerbation of COPD / Respiratory distress following submersion incident.
Contra-Indications	Known severe adverse reaction.
Usual Dosages	<b>Adult:</b> 5 mg NEB or 0.1 mg metered aerosol spray (repeat aerosol x 11) Repeat at 5 minute intervals prn <b>EFR</b> assist patient with Asthma/ Anaphylaxis. - 0.1 mg metered aerosol spray (repeat aerosol x 11 prn)  <b>Paediatric:</b> < 5 yrs - 2.5 mg NEB or 0.1 mg metered aerosol spray (repeat aerosol x 5). ≥ 5 yrs - 5 mg NEB or 0.1 mg metered aerosol spray (repeat aerosol x 11). (Repeat at 5 minute intervals prn).  <b>EFR</b> : assist patient with Asthma/ Anaphylaxis – < 5 yrs - 0.1 mg metered aerosol spray (repeat aerosol x 5 prn). ≥ 5 yrs - 0.1 mg metered aerosol spray (repeat aerosol x 11 prn).
Pharmacology / Action	Beta-2 agonist / Bronchodilation / Relaxation of smooth muscle.
Side effects	Tachycardia / Tremors / Tachyarrhythmias / High doses may cause Hypokalaemia.
Additional information	It is more efficient to use a volumiser in conjunction with an aerosol inhaler when administering Salbutamol. If an oxygen driven nebuliser is used to administer Salbutamol for a patient with acute exacerbation of COPD it should be limited to 6 minutes maximum.

## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Sodium Bicarbonate injection BP
<b>Class</b>	Alkalinizing agent.
<b>Descriptions</b>	A salt that is an alkalinizing agent and electrolyte supplement.
<b>Presentation</b>	Glass vial 8.4% in 100 mL.
<b>Administration</b>	IV/IO. ( <b>CPG:</b> 4/5/6.4.3, 5/6.4.4, 4/5/6.4.6, 6.4.22, 4/5/6.6.4).
<b>Indications</b>	Wide complex QRS arrhythmias and / or seizures following Tricyclic antidepressant (TCA) overdose. Cardiac arrest following Tricyclic overdose. Cardiac arrest following harness induced suspension trauma.
<b>Contra-Indications</b>	Known severe adverse reaction.
<b>Usual Dosages</b>	<b>Adult:</b> 1 mEq/Kg (1 mL/Kg 8.4% solution). Max 50 mEq (50 mL 8.4%).  <b>Paediatric:</b> Not indicated.
<b>Pharmacology / Action</b>	TCA excretion from the body is enhanced by making the urine more alkaline (raising the pH).
<b>Side effects</b>	Nil when used for emergencies.
<b>Additional Information</b>	Sodium Bicarbonate 8.4% is a 1 mmol/mL solution.

## APPENDIX 1 – Medication Formulary

Clinical Level:



Medication	<b>Sodium Chloride 0.9% (NaCl)</b>
Class	Isotonic crystalloid solution.
Descriptions	Solution of Sodium and Chloride, also known as normal saline (NaCl).
Presentation	Soft pack for infusion 100 mL, 500 mL and 1,000 mL. Ampoules 10 mL / pre-filled syringe 10 mL.
Administration	IV infusion / IV flush / IO. <b>Paramedic:</b> maintain infusion once commenced. ( <b>CPG: Sodium Chloride 0.9% is used extensively throughout the CPGs.</b> )
Indications	IV/IO fluid for pre-hospital emergency care.
Contra-Indications	Known severe adverse reaction.
Usual Dosages	<p><b>Adult:</b> Keep vein open (KVO) or medication flush for cardiac arrest prn.</p> <p><b>Asystole / PEA</b> - Consider fluid challenge 1 L IV/IO (repeat prn).</p> <p><b>Crush injury</b> - 20 mL/Kg IV/IO infusion.</p> <p><b>Suspension Trauma</b> - 2 L IV (Maintain systolic BP &gt; 90 mmHg).</p> <p><b>Hypothermia:</b> 250 mL IV/IO infusion (warmed to 40°C approx.) (Repeat to max 1 L).</p> <p><b># Neck of femur / Sepsis / Symptomatic bradycardia / Tachycardia</b> -Torsades de pointes: 250 mL IV infusion.</p> <p><b>Decompression illness / Sepsis with poor perfusion:</b> 500 mL IV/IO infusion.</p> <p><b>Shock from blood loss:</b> 500 mL IV/IO infusion. Repeat in aliquots of 250 mL IV/IO to maintain SBP of 90-100 mmHg. For associated <b>Head injury</b> with GCS ≤ 8 maintain SBP of 120 mmHg.</p> <p><b>Burns:</b> &gt; 25% TBSA and / or 1 hour from time of injury to ED, 1000 mL IV/IO infusion. &gt; 10% TBSA consider 500 mL IV/IO infusion.</p> <p><b>Adrenal insufficiency / Glycaemic Emergency / Heat Related Emergency / Sickle Cell Crisis:</b> 1,000 mL IV/IO infusion.</p> <p><b>Anaphylaxis and Postpartum Haemorrhage:</b> 1,000 mL IV/IO infusion (repeat x 1 prn).</p> <p><b>Post-resuscitation care:</b> 250 mL IV/IO infusion, if persistent hypotension to maintain SBP &gt; 100 mmHg or MAP &gt; 70 mmHg.</p> <p><b>Paediatric:</b></p> <p><b>Glycaemic Emergency / Neonatal Resuscitation / Sickle Cell Crisis:</b> 10 mL/Kg IV/IO infusion.</p> <p><b>Hypothermia:</b> 10 mL/Kg IV/IO infusion (warmed to 40°C approx.) (repeat x 1 prn).</p> <p><b>Haemorrhagic shock:</b> 10 mL/Kg IV/IO repeat prn if signs of inadequate perfusion.</p> <p><b>Anaphylaxis:</b> 20 mL/Kg IV/IO infusion (repeat x 1 prn).</p> <p><b>Adrenal insufficiency / Crush injury / Septic shock / Suspension Trauma / Symptomatic Bradycardia / Suspension Trauma:</b> 20 mL/Kg IV/IO infusion.</p> <p><b>Asystole / PEA</b> – Consider fluid challenge 20 mL/Kg IV/IO.</p> <p><b>Post-resuscitation care:</b> 20 mL/Kg IV/IO infusion if persistent poor perfusion or &lt; 5<sup>th</sup> percentile SBP.</p> <p><b>Burns:</b> &gt; 10% TBSA and / or &gt; 1 hour from time of injury to ED:</p> <ul style="list-style-type: none"> <li>• <b>5 – 10 years:</b> 250 mL IV/IO /</li> <li>• <b>&gt; 10 years:</b> 500 mL IV/IO.</li> </ul>
Pharmacology / Action	Isotonic crystalloid solution / Fluid replacement.
Side effects	Excessive volume replacement may lead to heart failure.
Additional information	Sodium Chloride 0.9% (NaCl) is the IV/IO fluid of choice for pre-hospital emergency care. For KVO use 500 mL pack only. Medication flush used in adult and paediatric cardiac arrest.

## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Tenecteplase Powder for injection																								
Class	Thrombolytic agent.																								
Descriptions	A recombinant fibrin-specific plasminogen activator.																								
Presentation	Powder and solvent for solution. 1 vial contains 10,000 units (50 mg) tenecteplase. 1 pre-filled syringe contains 10 mL water for injections. The reconstituted solution contains 1,000 units (5 mg) tenecteplase per mL.																								
Administration	IV. ( <i>CPG</i> : 5/6.4.10).																								
Indications	Confirmed STEMI and patient conscious, coherent and understands therapy / Patient consent obtained / Patient not suitable for PPCI from a time or clinical perspective.																								
Contra-Indications	Haemorrhagic stroke or stroke of unknown origin at any time / Ischaemic stroke in previous 6 months / Central nervous system damage or neoplasms / Recent major trauma - surgery - head injury (within 3 weeks) / Gastro-intestinal bleeding within the last month / Active peptic ulcer / Known bleeding disorder / Oral anticoagulant therapy / Aortic dissection / Transient ischaemic attack in preceding 6 months / Pregnancy and within one week post-partum / Non-compressible punctures / Traumatic resuscitation / Refractory hypertension (Sys BP > 180 mmHg) / Advanced liver disease / Infective endocarditis.																								
Usual Dosages	<b>Adult:</b> <table><thead><tr><th>Kg</th><th>Units</th><th>mg</th><th>mL</th></tr></thead><tbody><tr><td>&lt; 60</td><td>6,000</td><td>30</td><td>6</td></tr><tr><td>≥ 60 &lt; 70</td><td>7,000</td><td>35</td><td>7</td></tr><tr><td>≥ 70 &lt; 80</td><td>8,000</td><td>40</td><td>8</td></tr><tr><td>≥ 80 &lt; 90</td><td>9,000</td><td>45</td><td>9</td></tr><tr><td>≥ 90</td><td>10,000</td><td>50</td><td>10</td></tr></tbody></table> <b>Paediatric:</b> Not indicated.	Kg	Units	mg	mL	< 60	6,000	30	6	≥ 60 < 70	7,000	35	7	≥ 70 < 80	8,000	40	8	≥ 80 < 90	9,000	45	9	≥ 90	10,000	50	10
Kg	Units	mg	mL																						
< 60	6,000	30	6																						
≥ 60 < 70	7,000	35	7																						
≥ 70 < 80	8,000	40	8																						
≥ 80 < 90	9,000	45	9																						
≥ 90	10,000	50	10																						
Pharmacology / Action	Tenecteplase is a recombinant fibrin-specific plasminogen activator that is derived from native t-PA by modifications at three sites of the protein structure. It binds to the fibrin component of the thrombus (blood clot) and selectively converts thrombus-bound plasminogen to plasmin, which degrades the fibrin matrix of the thrombus.																								
Side effects	Haemorrhage predominantly superficial at the injection site. Ecchymoses are observed commonly but usually do not require any specific action. Stroke (including intracranial bleeding) and other serious bleeding episodes.																								
Additional information	Enoxaparin should be used as antithrombotic adjunctive therapy.																								

## APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Ticagrelor
<b>Class</b>	Platelet aggregation inhibitor.
<b>Descriptions</b>	An inhibitor of platelet function.
<b>Presentation</b>	90 mg tablets.
<b>Administration</b>	PO. ( <i>CPG</i> : 5/6.4.10).
<b>Indications</b>	Identification of ST elevation myocardial infarction (STEMI) if transporting to PPCI centre.
<b>Contra-Indications</b>	Hypersensitivity to the active substance (Ticagrelor) or to any of the excipients / Active pathological bleeding / History of intracranial haemorrhage / Moderate to severe hepatic impairment.
<b>Usual Dosages</b>	<b>Adult:</b> Loading dose 180 mg PO. <b>Paediatric:</b> Not indicated.
<b>Pharmacology / Action</b>	Ticagrelor is a selective adenosine diphosphate (ADP) receptor antagonist acting on the P2Y12 ADP-receptor that can prevent ADP-mediated platelet activation and aggregation. Ticagrelor is orally active, and reversibly interacts with the platelet P2Y12 ADP-receptor. Ticagrelor does not interact with the ADP binding site itself, but interacts with platelet P2Y12 ADP-receptor to prevent signal transduction.
<b>Side effects</b>	<b>Common:</b> Dyspnoea / Epistaxis / Gastrointestinal haemorrhage / Subcutaneous or dermal bleeding / Bruising and Procedural site haemorrhage. <b>Other undesirable effects include:</b> Intracranial bleeding / Elevations of serum creatinine and uric acid levels. Consult SmPC for a full list of undesirable effects.
<b>Additional information</b>	<b>Special authorisation:</b> Advanced paramedics and paramedics are authorised to administer Ticagrelor 180 mg PO following identification of STEMI and medical practitioner instruction. If a patient has been loaded with an anti-platelet medication (other than Aspirin), prior to the arrival of the practitioner, the patient should not have Ticagrelor administered.

## APPENDIX 1 – Medication Formulary

Clinical level:

AP

Medication	<b>Tranexamic Acid</b>
<b>Class</b>	Anti-fibrinolytic.
<b>Descriptions</b>	An anti-fibrinolytic which reduces the breakdown of blood clots.
<b>Presentation</b>	Ampoule 500 mg in 5 mL.
<b>Administration</b>	Intravenous injection (IV). Intraosseous (IO). ( <i>CPG</i> : 5/6.6.8, 4/5/6.5.4).
<b>Indications</b>	Suspected significant internal or external haemorrhage associated with trauma Postpartum Haemorrhage.
<b>Contra-Indications</b>	Hypersensitivity to the active substance or to any of the excipients / Acute venous or arterial thrombosis / History of convulsions / Known severe renal impairment.
<b>Usual Dosages</b>	<b>Adult:</b> 1 g IV/IO (infusion in 100 mL NaCl).  <b>Paediatric:</b> Not indicated.
<b>Pharmacology / Action</b>	Tranexamic acid exerts an anti-haemorrhagic activity by inhibiting the activation of plasminogen to plasmin, by binding to specific sites of plasminogen and plasmin, a molecule responsible for the degradation of fibrin, a protein that forms the framework of blood clots.
<b>Side effects</b>	<b>Common:</b> Diarrhoea / Nausea / Vomiting.  <b>Other undesirable effects include:</b> Visual disturbance / Impaired coloured vision / Dizziness / Headache.
<b>Additional information</b>	Caution with head injury.

## APPENDIX 2 – Medications & Skills Matrix

### New Medications and Skills for 2017

CLINICAL LEVEL	CFR-C	CFR-A	FAR/OFA	EFR	EMT	P	AP
Active Spinal Motion Restriction				✓	✓	✓	✓
Epinephrine (1:1,000) IM					✓		
Chest auscultation					✓		
Wound closure clips					BTEC	✓	✓
Methoxyflurane INH					✓	✓	✓
Chlorphenamine PO IM					✓	✓	✓
Passive Spinal Motion Restriction						✓	✓
Lateral dislocation of patella – reduction						✓	
Cyclizine IM						✓	
Ondansetron IM						✓	
Oxytocin IM						✓	
Management of presenting umbilical cord (finger control)						✓	
Adenosine IV							✓
Chlorphenamine IV							✓
Ceftriaxone IV/IO/IM							✓
Glycopyrronium Bromide SC							✓
Hyoscine Butylbromide SC							✓
Haloperidol SC PO							✓
Paracetamol IV							✓
Ketamine IV							✓

Care management including the administration of medications as per level of training and division on the PHECC Register and Responder levels.

Pre-Hospital Responders and Practitioners shall only provide care management including medication administration for which they have received specific training. Practitioners must be privileged by a licensed CPG provider to administer specific medications and perform specific clinical interventions.

#### Key:

- ✓ = Authorised under PHECC CPGs
- URMPIO = Authorised under PHECC CPGs under registered medical practitioner's instructions only
- APO = Authorised under PHECC CPGs to assist practitioners only (when applied to EMT, to assist Paramedic or higher clinical levels)
- ✓SA = Authorised subject to special authorisation as per CPG
- BTEC = Authorised subject to Basic Tactical Emergency Care rules

#### Paramedic authorisation for IV continuation

Practitioners should note that PHECC registered paramedics are authorised to continue an established IV infusion in the absence of an advanced paramedic or doctor during transportation.



## APPENDIX 2 – Medications & Skills Matrix

### MEDICATIONS

CLINICAL LEVEL	CFR-C	CFR-A	FAR/OFA	EFR	EMT	P	AP
Aspirin PO	✓	✓	✓	✓	✓	✓	✓
Oxygen		✓		✓	✓	✓	✓
Glucose gel Buccal				✓	✓	✓	✓
GTN SL				✓SA	✓	✓	✓
Epinephrine (1:1,000) auto injector				✓SA	✓	✓	✓
Salbutamol Aerosol				✓SA	✓	✓	✓
Chlorphenamine PO IM					✓	✓	✓
Epinephrine (1:1,000) IM					✓	✓	✓
Glucagon IM					✓	✓	✓
Ibuprofen PO					✓	✓	✓
Methoxyflurane INH					✓	✓	✓
Naloxone IN					✓	✓	✓
Nitrous Oxide & Oxygen (Entonox®)					✓	✓	✓
Paracetamol PO					✓	✓	✓
Salbutamol nebule					✓	✓	✓
Clopidogrel PO						✓	✓
Cyclizine IM						✓	✓
Hydrocortisone IM						✓	✓
Ipratropium Bromide nebule						✓	✓
Midazolam IM/Buccal/IN						✓	✓
Naloxone IM/SC						✓	✓
Ondansetron IM						✓	✓
Oxytocin IM						✓	✓
Ticagrelor						✓	✓
Sodium Chloride 0.9% IV/IO						✓SA	✓
Adenosine IV							✓
Amiodarone IV/IO							✓
Atropine IV/IO							✓
Ceftriaxone IV/IO/IM							✓
Chlorphenamine IV							✓
Cyclizine IV							✓
Dextrose 10% IV							✓
Dextrose 5% IV							✓
Diazepam IV/PR							✓
Epinephrine (1:10,000) IV/IO							✓
Fentanyl IN/IV							✓
Furosemide IV/IM							✓
Glycopyrronium Bromide SC							✓
Haloperidol SC PO							✓
Hartmann's Solution IV/IO							✓
Hydrocortisone IV							✓

## APPENDIX 2 – Medications & Skills Matrix

Hyoscine Butylbromide SC							✓
Ketamine IV							✓
Lorazepam PO							✓
Magnesium Sulphate IV							✓
Midazolam IV							✓
Morphine IV/PO/IM							✓
Naloxone IV/IO							✓
Nifedipine PO							✓
Ondansetron IV							✓
Paracetamol IV/PR							✓
Sodium Bicarbonate IV/IO							✓
Tranexamic Acid							✓
Enoxaparin IV/SC							✓ SA
Lidocaine IV							✓ SA
Tenecteplase IV							✓ SA

## AIRWAY & BREATHING MANAGEMENT

CLINICAL LEVEL	CFR-C	CFR-A	FAR/OFA	EFR	EMT	P	AP
FBAO management	✓	✓	✓	✓	✓	✓	✓
Head tilt chin lift	✓	✓	✓	✓	✓	✓	✓
Pocket mask	✓	✓	✓	✓	✓	✓	✓
Recovery position	✓	✓	✓	✓	✓	✓	✓
Non rebreather mask		✓		✓	✓	✓	✓
OPA		✓		✓	✓	✓	✓
Suctioning		✓		✓ SA	✓	✓	✓
Venturi mask		✓		✓	✓	✓	✓
BVM		✓		✓	✓	✓	✓
SpO <sub>2</sub> monitoring				✓	✓	✓	✓
Jaw thrust				✓	✓	✓	✓
Nasal cannula		✓		✓	✓	✓	✓
Oxygen humidification				✓	✓	✓	✓
NPA				BTEC	BTEC	✓	✓
Supraglottic airway adult (uncuffed)		✓			✓	✓	✓
Supraglottic airway adult (cuffed)					✓ SA	✓	✓
CPAP / BiPAP						✓	✓
Non-invasive ventilation device						✓	✓
Peak Expiratory Flow						✓	✓

## APPENDIX 2 – Medications & Skills Matrix

### AIRWAY & BREATHING MANAGEMENT (contd.)

CLINICAL LEVEL	CFR-C	CFR-A	FAR/OFA	EFR	EMT	P	AP
End Tidal CO <sub>2</sub> monitoring						✓	✓
Supraglottic airway paediatric						✓	✓
Endotracheal intubation							✓
Laryngoscopy and Magill forceps							✓
Needle cricothyrotomy							✓
Needle thoracocentesis							✓

### CARDIAC

CLINICAL LEVEL	CFR-C	CFR-A	FAR/OFA	EFR	EMT	P	AP
AED adult & paediatric	✓	✓	✓	✓	✓	✓	✓
CPR adult, child & infant	✓	✓	✓	✓	✓	✓	✓
Recognise death and resuscitation not indicated	✓	✓	✓	✓	✓	✓	✓
Neonate resuscitation					✓	✓	✓
ECG monitoring (lead II)					✓	✓	✓
Mechanical assist CPR device					✓	✓	✓
Cease resuscitation - adult					✓ SA	✓	✓
12 lead ECG						✓	✓
Manual defibrillation						✓	✓
Right sided ECG in ACS						✓	✓

### HAEMORRHAGE CONTROL

CLINICAL LEVEL	CFR-C	CFR-A	FAR/OFA	EFR	EMT	P	AP
Direct pressure			✓	✓	✓	✓	✓
Nose bleed			✓	✓	✓	✓	✓
Haemostatic agent				BTEC	✓	✓	✓
Tourniquet use				BTEC	BTEC	✓	✓
Wound closure clips					BTEC	✓	✓
Nasal pack						✓	✓
Pressure points						✓	✓

## APPENDIX 2 – Medications & Skills Matrix

### MEDICATION ADMINISTRATION

CLINICAL LEVEL	CFR-C	CFR-A	FAR/OFA	EFR	EMT	P	AP
Oral	✓	✓	✓	✓	✓	✓	✓
Buccal route				✓	✓	✓	✓
Per aerosol (inhaler) + spacer				✓SA	✓	✓	✓
Sublingual				✓SA	✓	✓	✓
Intramuscular injection					✓	✓	✓
Intranasal					✓	✓	✓
Per nebuliser					✓	✓	✓
Subcutaneous injection					✓	✓	✓
IV & IO Infusion maintenance						✓	✓
Infusion calculations							✓
Intraosseous injection/infusion							✓
Intravenous injection/infusion							✓
Per rectum							✓

### TRAUMA

CLINICAL LEVEL	CFR-C	CFR-A	FAR/OFA	EFR	EMT	P	AP
Burns care			✓	✓	✓	✓	✓
Application of a sling			✓	✓	✓	✓	✓
Soft tissue injury			✓	✓	✓	✓	✓
Active Spinal Motion Restriction			✓	✓	✓	✓	✓
Hot packs for active rewarming (hypothermia)			✓	✓	✓	✓	✓
Cervical collar application				✓	✓	✓	✓
Helmet stabilisation/removal				✓	✓	✓	✓
Splinting device application to upper limb				✓	✓	✓	✓
Splinting device application to lower limb				✓	✓	✓	✓
Log roll				APO	✓	✓	✓
Move patient with a carrying sheet				APO	✓	✓	✓
Extrication using a long board				✓SA	✓	✓	✓
Rapid Extrication				✓SA	✓	✓	✓
Secure and move a patient with an extrication device				✓SA	✓	✓	✓
Move a patient with a split device (Orthopaedic stretcher)				✓SA	✓	✓	✓
Passive Spinal Motion Restriction						✓	✓

## APPENDIX 2 – Medications & Skills Matrix

### TRAUMA (contd.)

CLINICAL LEVEL	CFR-C	CFR-A	FAR/OFA	EFR	EMT	P	AP
Pelvic Splinting device				BTEC	✓	✓	✓
Move and secure patient into a vacuum mattress				BTEC	✓	✓	✓
Move and secure a patient to a paediatric board					✓	✓	✓
Traction splint application					APO	✓	✓
Lateral dislocation of patella – reduction						✓	✓
Taser gun barb removal						✓	✓

### OTHER

CLINICAL LEVEL	CFR-C	CFR-A	FAR/OFA	EFR	EMT	P	AP
Use of Red Card	✓	✓	✓	✓	✓	✓	✓
Assist in the normal delivery of a baby				APO	✓	✓	✓
De-escalation and breakaway skills					✓	✓	✓
ASHICE radio report					✓	✓	✓
IMIST-AMBO handover					✓	✓	✓
External massage of uterus						✓	✓
Broselow tape						✓	✓
Management of presenting umbilical cord (finger control)						✓	✓
Verification of Death						✓	✓
Intraosseous cannulation							✓
Intravenous cannulation							✓
Urinary catheterisation							✓

### PATIENT ASSESSMENT

CLINICAL LEVEL	CFR-C	CFR-A	FAR/OFA	EFR	EMT	P	AP
Assess responsiveness	✓	✓	✓	✓	✓	✓	✓
Check breathing	✓	✓	✓	✓	✓	✓	✓
FAST assessment	✓	✓	✓	✓	✓	✓	✓
Capillary refill			✓	✓	✓	✓	✓
AVPU			✓	✓	✓	✓	✓
Pulse check			✓	✓	✓	✓	✓
Breathing & pulse rate		✓ SA	✓	✓	✓	✓	✓

## APPENDIX 2 – Medications & Skills Matrix

### PATIENT ASSESSMENT (contd.)

CLINICAL LEVEL	CFR-C	CFR-A	FAR/OFA	EFR	EMT	P	AP
Primary survey			✓	✓	✓	✓	✓
SAMPLE history			✓	✓	✓	✓	✓
Secondary survey			✓	✓	✓	✓	✓
CSM assessment				✓	✓	✓	✓
Rule of Nines				✓	✓	✓	✓
Assess pupils				✓	✓	✓	✓
Blood pressure				✓ SA	✓	✓	✓
Capacity evaluation					✓	✓	✓
Chest auscultation					✓	✓	✓
Glucometry					✓	✓	✓
Paediatric Assessment Triangle					✓	✓	✓
Pain assessment					✓	✓	✓
Patient Clinical Status					✓	✓	✓
Temperature °C					✓	✓	✓
Triage sieve					✓	✓	✓
Glasgow Coma Scale (GCS)						✓	✓
Pre-hospital Early Warning Score						✓	✓
Treat and referral						✓	✓
Triage sort						✓	✓

## APPENDIX 3 – Critical Incident Stress Management

### Your Psychological Well-Being

It is extremely important for your psychological well-being that you do not expect to save every critically ill or injured patient that you treat. For a patient who is not in hospital, whether they survive a cardiac arrest or multiple traumas depends on a number of factors including any other medical condition the patient has. Your aim should be to perform your interventions well and to administer the appropriate medications within your scope of practice. However, sometimes you may encounter a situation which is highly stressful for you, giving rise to Critical Incident Stress (CIS). A critical incident is an incident or event which may overwhelm or threaten to overwhelm our normal coping responses. As a result of this we can experience CIS.

#### How do I know when I am adversely affected by a critical incident(s)?

Listed below are some common ways in which people react to incidents like this:

- Feeling of distress
- Feeling of sadness
- Strong feeling of anger
- Feeling of disillusionment
- Feeling of guilt
- Feeling of apprehension/anxiety/fear of:
  - losing control/breaking down or
  - something similar happening again
  - not having done all I think I could have done
- Avoidance of the scene of incident/trauma or of anything that reminds you of it
- Bad dreams or nightmares
- Distressing memories or 'flashbacks' of the incident
- Feeling 'on edge', irritable, angry, under threat/pressure
- Feeling emotionally fragile – unable to experience your normal range of emotions
- Feeling cut off from your family or close friends – "I can't talk to them" or "I don't want to upset them"

#### SOME DOS AND DON'TS

- DO** express your emotions
- DO** talk about what has happened as often as you need to
- DO** find opportunities to review the experience
- DO** discuss what happened with colleagues
- DO** look to friends and colleagues for support
- DO** listen sympathetically if a colleague wants to speak with you, unless it is too distressing
- DO** advise colleagues who need more help where they can get appropriate help
- DO** try to keep your life as normal as possible
- DO** keep to daily routines
- DO** drive more carefully
- DO** be more careful around the home
- DON'T** use alcohol, nicotine or other drugs to hide your feelings
- DON'T** simply stay away from work – seek help and support
- DON'T** allow anger and irritability to mask your feelings
- DON'T** bottle up feelings
- DON'T** be afraid to ask for help
- DON'T** think your feelings are signs of weakness

Everyone may have these feelings. Experience has shown that they may vary in intensity according to circumstance. Nature heals through allowing these feelings to come out. This will not lead to loss of control, but stopping these feelings may lead to other and possibly more complicated problems.

#### WHEN TO FIND HELP

1. If you feel you cannot cope with your reactions or feelings.
2. If your stress reactions do not lessen in the two or three weeks following the event.
3. If you continue to have nightmares and poor sleep.
4. If you have no-one with whom to share your feelings when you want to do so.
5. If your relationships seem to be suffering badly, or sexual problems develop.
6. If you become clumsy or accident prone.
7. If, in order to cope after the event, you smoke, drink or take more medication, or other drugs.
8. If your work performance suffers.
9. If you are tired all the time.
10. If things get on top of you and you feel like giving up.
11. If you take it out on your family.
12. If your health deteriorates.

## APPENDIX 3 – Critical Incident Stress Management

### Experiencing signs of excessive stress?

If the range of physical, emotional and behavioural signs and symptoms already mentioned do not reduce over time (for example after two weeks), it is important that you seek support and help.

#### Where to find help?

Your own licensed CPGs provider will have a CISM support network or system.

We recommend that you contact them for help and advice (i.e. your peer support worker/coordinator/staff support officer).

- For a self-help guide, please go to [www.cismnetworkireland.ie](http://www.cismnetworkireland.ie)
- The NAS CISM and CISM Network published a booklet called 'Critical Incident Stress Management for Emergency Personnel'.

It can be purchased by emailing:  
[info@cismnetworkireland.ie](mailto:info@cismnetworkireland.ie)

- Consult your own GP or see a health professional who specialises in traumatic stress.
- The NAS CISM Committee in partnership with PHECC developed an eLearning CISM Stress Awareness Training (SAT) module. It can be accessed by the following personnel:
  - PHECC registered practitioners at all levels
  - National Ambulance Service-linked community first responders
  - NAS non-PHECC registered personnel
- SAT modules in development for CISM Network member organisations.



## APPENDIX 4 – CPG Updates for Advanced Paramedics

### New AP CPGs in 2017 Edition

To support upskilling of the 2017 CPGs new CPGs are identified below.

New CPGs	The new skills and medications incorporated into the CPGs are:
CPG 4/5/6.8.6 Team Resuscitation	This CPG outlines the team approach to resuscitation and defines specific roles for team members.
CPG 5/6.8.7 Palliative Care – Adult	This CPG outlines the care of a patient with a known life-limiting illness, who is currently receiving palliative care services under the direction of a GP.
CPG 5/6.8.8 Verification of Death	This CPG outlines the procedure for verification of death following ceasing of resuscitation or recognition of death.

### Deleted AP CPG in 2017 Edition

CPG Deleted	
CPG 5/6.7.52 Spinal Immobilisation – Paediatric	This CPG has been deleted. Both Adult and Paediatric Spinal Injury Management CPGs have been incorporated into one Spinal Injury Management CPG 5/6.6.9.

## APPENDIX 4 – CPG Updates for Advanced Paramedics

### Updated AP CPGs from the 2014 version

To support upskilling of the 2017 CPGs, the changes are outlined below.

**Practitioners should also be advised that there are updated care principles in this edition.**

#### Paramedic authorisation for IV infusion continuation

In an attempt to reduce unnecessary content on CPGs, the authorisation for PHECC registered paramedics to continue an established IV infusion in the absence of an advanced paramedic or doctor during transportation, has been specified in the medication formulary and deleted from the CPGs. Similarly, the list of equipment has been deleted from all CPGs.

CPGs	The principal differences are:
CPG 4/5/6.2.6 Pain Management – Adult	<p>The CPG layout has been changed significantly</p> <p><b>Deleted</b></p> <p>‘And/or’ - for Paracetamol and Ibuprofen for moderate pain</p> <p>Scores depicting severe, moderate and mild pain</p> <p><b>Added</b></p> <p>‘Consider medical advice’</p> <p>Pathway to nausea &amp; vomiting CPG</p> <p>Management of severe pain classified into 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> line administration of analgesia</p> <p>Methoxyflurane 3 mL INH for moderate pain</p> <p>Paracetamol 1 g IV for severe pain (2<sup>nd</sup> line)</p> <p>Ketamine 0.1 mg/Kg IV for severe pain (3<sup>rd</sup> line)</p> <p><b>Medication updates</b></p> <p>Ibuprofen for mild pain</p> <p>Ibuprofen dose increased to 600 mg PO for moderate pain in conjunction with Paracetamol 1 g PO</p> <p>Morphine initial dose increased to 4 mg IV</p> <p>Morphine maximum dose increased to 16 mg and 20 mg for musculoskeletal pain</p> <p>Fentanyl 0.05 mg IV for severe pain</p> <p>Following an initial Fentanyl IN dose, the next dose may be Fentanyl IV OR Morphine IV but not both; if unable to acquire IV access, a second dose of Fentanyl IN may be administered</p> <p>Option to administer Fentanyl 0.05 mg IV OR Morphine 4 mg IV AND/OR Paracetamol 1 g IV for 2<sup>nd</sup> line management of severe pain</p>
CPG 5/6.3.1 Advanced Airway Management – Adult	<p><b>Deleted</b></p> <p>Information box regarding CPR hands-off time</p> <p><b>Updated</b></p> <p>Capnography now mandatory with ETT insertion, with waveform capnography the preferred option</p>

## APPENDIX 4 – CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
CPG 4/5/6.3.4 Asthma – Adult	<p><b>Added</b> Consider CO<sub>2</sub> monitoring 'Consider PEFR prior to Salbutamol administration' – advice box</p> <p><b>Medication update</b> Salbutamol aerosol 0.1 mg repeat increased from 5 to 11 times</p>
CPG 4/5/6.4.1 Basic Life Support – Adult	<p><b>Deleted</b> 'Commence CPR while defibrillator is being prepared only if 2<sup>nd</sup> person available' Chest compression depth: at least 5 cm</p> <p><b>Added</b> 'Commence continuous chest compressions (or CPR) while defibrillator is being prepared' 1 practitioner on site = continuous chest compressions 2 or more practitioners / responders on site = CPR Chest compression depth: 5 to 6 cm Oxygen therapy de-emphasised during initial resuscitation to minimise chest compression delay</p>
CPG 4/5/6.4.3 VF or pVT – Adult	<p>Renamed from 'VF or Pulseless VT – Adult' to 'VF or pVT – Adult'</p> <p><b>Deleted</b> Driving graphic and information box regarding mechanical CPR device Amiodarone weight-based dose</p> <p><b>Added</b> Defibrillate – (escalating energy)</p> <p><b>Medication updates</b> Epinephrine every 2<sup>nd</sup> cycle If refractory VF/pVT administer Amiodarone post Epinephrine and 3<sup>rd</sup> shock, second dose after 5<sup>th</sup> shock Lidocaine dose changed from 1 – 1.5 mg/Kg to 100 mg IV</p>
CPG 5/6.4.4 Asystole – Adult	<p><b>Deleted</b> Information box regarding CPR hands-off time Consider waveform capnography</p> <p><b>Medication updates</b> 1<sup>st</sup> dose of Epinephrine instruction Epinephrine every 2<sup>nd</sup> cycle Fluid challenge changed from 20 mL/Kg to 1 L NaCl</p>
CPG 4/5/6.4.6 Pulseless Electrical Activity – Adult	<p><b>Deleted</b> Driving graphic and information box regarding mechanical CPR device Information box regarding CPR hands-off time Consider waveform capnography</p>

## APPENDIX 4 – CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
CPG 4/5/6.4.6 Pulseless Electrical Activity – Adult (Contd.)	<b>Medication updates</b> 1 <sup>st</sup> dose of Epinephrine instruction Epinephrine every 2 <sup>nd</sup> cycle Fluid challenge changed from 20 mL/Kg to 1 L NaCl
CPG 5/6.4.7 Post-Resuscitation Care – Adult	<b>Deleted</b> ‘Positive pressure ventilations’ mandatory box Titrate O <sub>2</sub> to 94% - 98% Avoid hyperthermia and commence cooling (target 32°C to 34°C) NaCl (4°C approx.) 1 L IV/IO Amiodarone for ventricular tachycardia - replaced by direction to Tachycardia CPG Atropine for Bradycardia - replaced by direction to Bradycardia CPG  <b>Added</b> ‘Airway’ to first decision box ‘Consider advanced airway and positive pressure ventilations’ ‘ETCO <sub>2</sub> ’ added to ECG and SpO <sub>2</sub> monitoring Special instruction box added for STEMI identification, contact Primary PCI facility for direction (follow ACS CPG) ‘Avoid warming’ Epinephrine 0.01 mg, for suspected cardiogenic shock Naloxone, for suspected opioid OD  <b>Medication updates</b> Amend persistent hypotension to ‘consider NaCl (0.9%) 250 mL IV/IO to maintain Sys BP > 100 mmHg and/or MAP > 70 mmHg’
CPG 5/6.4.10 Acute Coronary Syndrome	<b>Deleted</b> ST elevation in two or more contiguous leads (2 mm in leads V2 and V3, or 1 mm in any other leads) or LBBB with clinical symptoms of AMI  <b>Added</b> ST elevation ≥ 1 mm in ≥ 2 adjacent limb leads and/or ≥ 2 mm in ≥ 2 adjacent chest leads OR (presumably) new LBBB with clinical symptoms of AMI Assess for right ventricular infarction in suspected inferior MI  <b>Medication updates</b> Oxygen therapy has been changed to ‘consider oxygen therapy’ Medical practitioner criteria for thrombolysis time of onset of symptoms changed from ‘between 20 minutes and 6 hours’ to ‘onset of symptoms ≤ 2 hours’
CPG 4/5/6.4.11 Symptomatic Bradycardia – Adult	12 Lead ECG now performed before the administration of Atropine  <b>Added</b> Epinephrine 0.01 mg IV, for suspected cardiogenic shock ‘Non-symptomatic’ - titrating Atropine to effect (HR > 60)

## APPENDIX 4 – CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
CPG 5/6.4.12 Tachycardia – Adult	<p>The algorithm flow through the CPG has been modified extensively</p> <p><b>Deleted</b></p> <p>Symptomatic – decision diamond</p> <p><b>Added</b></p> <p>‘non-sinus tachycardia’ – new entry point to CPG  ‘Adverse signs’ decision diamond (replacing ‘symptomatic’)  ‘If unsuccessful escalate energy by 50 J’ - synchronised cardioversion</p> <p><b>New Medications</b></p> <p>Adenosine 6 mg IV  NaCl 500 mL IV</p>
CPG 4/5/6.4.15 Allergic Reaction/Anaphylaxis – Adult	<p><b>Deleted</b></p> <p>‘Angio-oedema’ from mild allergic signs  ‘No improvement’ from re-occurs decision diamond  ‘Asthma’ replaced with ‘bronchospasm’</p> <p><b>Added</b></p> <p>EMT level – all three practitioner levels now combined  ‘Effective’ to pre-arrival Epinephrine decision diamond  ‘Poor improvement’ into re-occurs decision diamond (replacing ‘no improvement’)  Bradycardia decision diamond  ‘Bronchospasm’ replacing ‘asthma’  ‘Angio-oedema’ to moderate allergic signs  ‘ABC compromise’ to severe allergic reaction/anaphylaxis signs and symptoms  Epinephrine auto injector (1:1,000) 0.3 mg IM</p> <p><b>New Medications</b></p> <p>Hydrocortisone IM for paramedic use  Chlorphenamine PO/IM/IV</p>
CPG 4/5/6.4.19 Glycaemic Emergency – Adult	<p>The algorithm flow through the CPG has been modified</p> <p><b>Added</b></p> <p>EMT level – all three practitioner levels now combined  ‘Conscious/able to swallow’ decision diamond for hypoglycaemia  Yes - Glucose gel 10 - 20 g buccal, sweetened drink  No - Dextrose or Glucagon 1 mg IM  ‘Advise a carbohydrate meal (sandwich)’</p>
CPG 5/6.4.23 Seizure/Convulsion – Adult	<p><b>Deleted</b></p> <p>IV access (yes/no) – decision diamond</p>

## APPENDIX 4 – CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
CPG 5/6.4.23 Seizure/Convulsion – Adult (Contd.)	<b>Medication updates</b> Benzodiazepine - maximum 4 doses regardless of route Consider medical advice if more than 4 doses indicated
CPG 4/5/6.4.24 Sepsis – Adult	<b>Deleted</b> Benzylpenicillin Commence with 100% O <sub>2</sub>  <b>Added</b> ‘advise triage nurse if SIRS + infection’ ‘On immune-suppressant medication’ – Could this be severe infection? ‘BP monitoring’ O <sub>2</sub> titrate to sats > 94% Risk stratifier instruction box Penicillin allergy instruction box Pre-alert ED updated with criteria; severe sepsis, septic shock, meningitis suspected or at risk of neutropenia Indications for antibiotic; severe sepsis, septic shock, meningitis suspected or at risk of neutropenia Signs of shock/poor perfusion updated to include; heart rate > 130, RR > 30, altered mental status and oligo or anuria  <b>Medication updates</b> 38.3°C new temperature for consideration for Paracetamol NaCl 0.9% 500 mL IV/IO prior to antibiotic NaCl 0.9% 500 mL IV/IO repeat x 3 prn  <b>New Medications</b> Ceftriaxone 2 g IV/IO/IM Paracetamol 1 g IV
CPG 5/6.4.26 Significant Nausea & Vomiting – Adult	<b>Deleted</b> ‘Post-narcotic administration for pain relief’ decision diamond  <b>Added</b> Paramedic level Check blood glucose Investigate and treat underlying cause  <b>Medication updates</b> Cyclizine 50 mg IM Ondansetron 4 mg IM
CPG 5/6.4.28 Stroke	<b>Deleted</b> Notifying ED prior to arrival following negative FAST assessment Oxygen therapy advice box

## APPENDIX 4 – CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
CPG 5/6.4.28 Stroke (Contd.)	<p><b>Added</b></p> <p>'T' in FAST changed to 'time of onset' from 'time to transport'</p>
CPG 6.4.29 Mental Health Emergency	<p>The wording of the CPG entry point updated to read; 'abnormal behaviour with a history of psychiatric illness'</p> <p><b>Deleted</b></p> <p>Midazolam IM or IV Lorazepam PO</p> <p><b>Added</b></p> <p>Consider consulting with medical advice if clinical judgement is that sedation may be required for a combative patient</p> <p>Capacity assessment updated to reflect Assisted Decision Making (Capacity) Act 2015 requirements</p>
CPG 4/5/6.4.30 Behavioural Emergency	<p>The algorithm flow through the CPG has been modified extensively</p> <p><b>Deleted</b></p> <p>'Saloon of ambulance' to reflect other modes of transport when considering two or more people accompanying the patient</p> <p><b>Added</b></p> <p>Capacity assessment updated to reflect Assisted Decision Making (Capacity) Act 2015 requirements</p> <p>Three potential causes of behavioural emergency; mental health, medical or traumatic causation and intoxication or withdrawal</p> <p>Decision diamond for patients 'aggressive/violent and/or risk to self or others and uncooperative with practitioner'</p> <p>For patients who are aggressive/violent and/or risk to self or others and uncooperative with practitioner;</p> <ul style="list-style-type: none"> <li>• ensure practitioner safety (await Garda if any doubt)</li> <li>• request ALS</li> <li>• consider verbal de-escalation</li> <li>• hand-over to Garda care if the patient has capacity and declines care</li> <li>• hand-over to registered medical practitioner/Garda care if the patient has capacity and is ill</li> <li>• consider treating reversible causes with Garda assistance</li> <li>• AP to seek medical advice regarding sedation and document shared decision, if aggression continuing</li> </ul> <p><b>New Medications</b></p> <p>Midazolam 5 mg IN/IM – Adult Midazolam 0.1 mg/Kg IN – Paediatric Lorazepam 2 mg PO – Adult</p>

## APPENDIX 4 – CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
CPG 5/6.5.1 Pre-Hospital Emergency Childbirth	<p><b>Deleted</b> Gestation period &lt; 28 weeks – decision diamond</p> <p><b>Added</b> Gestation period &lt; 32 weeks – decision diamond Preference for skin to skin (when wrapping baby and presenting to mother)</p>
CPG 5/6.5.2 Basic & Advanced Life Support – Neonate (< 4 weeks)	<p><b>Deleted</b> Gestation period &lt; 28 weeks – decision diamond Give supplementary O<sub>2</sub></p> <p><b>Added</b> Gestation period &lt; 32 weeks – decision diamond Record time of birth Following birth, all elements up to the 'provision of 5 positive pressure ventilations' to be completed within 60 seconds ECG monitor to assess heart rate 'Gasping breaths' added to 'apnoeic or HR &lt; 100' '(room air)' - Provide 5 positive pressure ventilations 30 second PPV (40 - 60 breaths per minute) - until breathing well, HR &gt; 100 Consider supplemental O<sub>2</sub> (≤ 30%) 'Monitor heart rate' decision diamond changed from 'assess heart rate' 'Pulse oximetry' changed to mandatory from consider</p>
CPG 4/5/6.5.3 PV Haemorrhage in Pregnancy	<p>Renamed from 'Haemorrhage in Pregnancy Prior to Delivery' to 'PV Haemorrhage in Pregnancy'.</p> <p><b>Deleted</b> 'Query' from entry point</p> <p><b>Added</b> EMT level ECG &amp; SPO<sub>2</sub> monitoring</p>
CPG 4/5/6.5.4 Postpartum Haemorrhage	<p><b>Deleted;</b> Syntometrine 1 mL IM Go to Shock CPG</p> <p><b>Added</b> EMT level External massage of the uterus - for paramedic level</p> <p><b>New Medications</b> Tranexamic Acid 1 g IV Oxytocin 5 international units IM NaCl 1 L IV</p>



## APPENDIX 4 – CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
CPG 4/5/6.5.5 Umbilical Cord Complications	<p><b>Deleted</b></p> <p>'Knee chest position'</p> <p>'Clamp the cord in two places and cut between both clamps'</p> <p><b>Added</b></p> <p>EMT level</p> <p>'Head down left lateral position' new terminology replacing 'knee chest position'</p> <p>'Hold presenting part off the cord using fingers' introduced for paramedic level</p> <p>'as shoulders are delivered' added to 'Ease the cord from around the neck'</p>
CPG 5/6.5.6 Breech Birth	<p><b>Deleted</b></p> <p>'Oxygen therapy'</p> <p>The restriction on paramedic assisting directly with breech birth</p> <p><b>Added</b></p> <p>'Consider Oxygen therapy'</p>
CPG 4/5/6.6.3 External Haemorrhage – Adult	<p><b>Added</b></p> <p>'Consider wound closure clips for temporary closure if still bleeding' – AP, P &amp; EMT-BTEC level</p>
CPG 4/5/6.6.4 Harness Induced Suspension Trauma	<p><b>Medication update</b></p> <p>NaCl (0.9%) 2 L IV maintain Sys BP &gt; 90 mmHg</p>
CPG 4/5/6.6.6 Heat Related Emergency – Adult	<p><b>Deleted</b></p> <p>'Exercise related dehydration should be treated with oral fluids (caution with over-hydration with water)'</p>
CPG 4/5/6.6.7 Limb Injury – Adult	<p><b>Deleted</b></p> <p>'Consider paramedic'</p> <p><b>Added</b></p> <p>'Request ALS' – following mid shaft femur fracture</p> <p>Reduction of isolated lateral dislocation of patella – paramedic level</p>
CPG 5/6.6.8 Actual/Potential Shock from Blood Loss (trauma) – Adult	<p>Renamed from 'Shock from Blood Loss (trauma) – Adult' to 'Actual/Potential Shock from Blood Loss (trauma) – Adult'</p> <p><b>Added</b></p> <p>Second entry route to CPG (mechanism suggestive of significant risk of haemorrhage)</p> <p>'Prioritise transport' - for non-trapped patients</p> <p>'Clinical signs of shock' - decision diamond</p> <p>Clinical pathway for transport of patients where there is no suspected significant internal/external haemorrhage</p>

## APPENDIX 4 – CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
CPG 5/6.6.9 Spinal Injury Management	<p>Renamed from 'Spinal Immobilisation – Adult' to 'Spinal Injury Management' incorporating both Adult and Paediatric patients</p> <p>This CPG has had significant alterations with a change in philosophy from 'spinal rule out' to 'spinal rule in'</p> <p><b>Practitioners are referred to Appendix 6 – Spinal Injury Management Recommendations for supporting information</b></p> <p><b>Full PHECC policy statement available at <a href="http://www.phecc.ie">www.phecc.ie</a></b></p>
CPG 4/5/6.7.4 Secondary Survey – Paediatric (≤ 15 years)	<p><b>Deleted</b></p> <p>'Check for normal patterns of feeding, toilet, sleeping, interaction with guardian'</p> <p>Head-to-toe examination list</p> <p><b>Added</b></p> <p>Take SAMPLE history</p> <p>Irish Children's Triage System normal range of vital signs</p>
CPG 4/5/6.7.5 Pain Management – Paediatric (≤ 15 years)	<p>The CPG layout has been changed significantly</p> <p><b>Deleted</b></p> <p>'And/or' - for Paracetamol and Ibuprofen for moderate pain</p> <p>Scores depicting severe, moderate and mild pain</p> <p><b>Added</b></p> <p>'Consider medical support'</p> <p>Pathway to nausea &amp; vomiting CPG</p> <p>Management of severe pain classified into 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> line administration of analgesia</p> <p>Request ALS if pain management is not resolved</p> <p>Methoxyflurane 3 mL INH for moderate pain (≥ 5 year olds)</p> <p>Paracetamol 1 g IV (≤ 1 year 7.5 mg/Kg IV, &gt; 1 year 15 mg/Kg IV) for severe pain</p> <p>Ketamine 0.1 mg/Kg IV for severe pain</p> <p><b>Medication updates</b></p> <p>Ibuprofen 10 mg/Kg PO for mild pain</p> <p>Ibuprofen 10 mg/Kg PO in conjunction with Paracetamol 20 mg/Kg PO for moderate pain</p> <p>Ondansetron IM (AP)</p> <p>Following initial Fentanyl IN the next dose can be either Fentanyl IN or Morphine IV but not both</p>
CPG 6.7.10 Advanced Airway Management – Paediatric (≤ 15 years)	<p><b>Deleted</b></p> <p>'Prolonged CPR' - entry point</p> <p>'Adequate ventilation &amp; oxygenation' - information box</p> <p>'Minimum interruption of chest compressions' - information box</p>

## APPENDIX 4 – CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
CPG 6.7.10 Advanced Airway Management – Paediatric (≤ 15 years) (Contd.)	<p><b>Added</b></p> <p>'Apnoea or special clinical considerations' - entry point</p> <p>'Capnography mandatory with ETT insertion (waveform capnography is preferred)'</p> <p>'Maximum two attempts at ETT and maximum two attempts at supraglottic airway insertion (either as primary device or rescue from failed ETT)' - instruction box</p>
CPG 4/5/6.7.12 Asthma – Paediatric (≤ 15 years)	<p><b>Added</b></p> <p>'Consider PEFR prior to Salbutamol administration' – advice box</p>
CPG 4/5/6.7.13 Stridor – Paediatric (≤ 15 years)	<p>'Humidified O<sub>2</sub>' and 'Do not distress' moved to earlier in the treatment algorithm</p> <p><b>Added</b></p> <p>'Request ALS'</p> <p>Epinephrine nebulised (&lt; 1 year 2.5 mg &amp; &gt; 1 year of age 5 mg)</p> <p>'Check temperature and if &gt; 38.5°C - go to Sepsis CPG'</p>
CPG 4/5/6.7.20 Basic Life Support – Paediatric (≤ 15 years)	<p><b>Deleted</b></p> <p>'Minimum interruption of chest compressions' - information box</p> <p>'Continue CPR while defibrillator is charging' - information box</p> <p>'Minimal interruptions of chest compressions and maximum hands-off time 10 seconds' - information box</p> <p><b>Added</b></p> <p>'Chest compression depth of 5 cm for a child and 4 cm for a small child or infant' - information box</p> <p>'4 J/Kg' - Shockable rhythms</p>
CPG 4/5/6.7.22 VF or pVT – Paediatric (≤ 15 years)	<p>Renamed from 'VF or Pulseless VT – Paediatric (≤ 15 years)' to 'VF or pVT – Paediatric (≤ 15 years)'</p> <p><b>Deleted</b></p> <p>'With CPR ongoing maximum hands-off chest 10 seconds and CPR during charging' - information box</p> <p>'Transport to ED if no change after 10 minutes resuscitation if no ALS available'</p> <p>Driving graphic</p> <p>'Mechanical CPR device' - information box</p> <p><b>Added</b></p> <p>'100% Oxygen'</p> <p>'Transport to ED if no change after 20 minutes resuscitation if no ALS available'</p> <p>Administration of Amiodarone amended to advise administration after third shock for refractory VF/VT post Epinephrine (5 mg/Kg IV/IO)</p> <p>Paramedic flag for advanced airway management</p> <p><b>Medication updates</b></p> <p>Epinephrine every 2<sup>nd</sup> cycle</p> <p>If refractory VF/pVT Amiodarone after Epinephrine and 3<sup>rd</sup> shock</p>

## APPENDIX 4 – CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
CPG 4/5/6.7.23 Asystole/PEA – Paediatric (≤ 15 years)	<p><b>Deleted</b></p> <p>‘With CPR ongoing maximum hands-off chest 10 seconds and CPR during charging’ - information box</p> <p>‘Transport to ED if no change after 10 minutes resuscitation if no ALS available’</p> <p>Driving graphic</p> <p>‘Mechanical CPR device’ - information box</p> <p><b>Added</b></p> <p>‘100% Oxygen’</p> <p>‘Transport to ED if no change after 20 minutes resuscitation if no ALS available’</p> <p>Paramedic flag for advanced airway management</p> <p><b>Medication update</b></p> <p>Initial Epinephrine as soon as practical</p>
CPG 4/5/6.7.24 Symptomatic Bradycardia – Paediatric (≤ 15 Years)	<p><b>Medication update</b></p> <p>Epinephrine every 2<sup>nd</sup> cycle</p>
CPG 5/6.7.25 Post-Resuscitation Care – Paediatric (≤ 15 years)	<p><b>Deleted</b></p> <p>‘Commence active cooling’</p> <p><b>Added</b></p> <p>‘Prevent warming’</p> <p>12 Lead ECG</p> <p>‘Consider ETCO<sub>2</sub> monitoring’</p> <p>‘5th percentile systolic BP = 70 mmHg + (2 x age)’ – information box</p> <p><b>Medication update</b></p> <p>NaCl - if &lt; 5th percentile systolic BP</p>
CPG 4/5/6.7.31 Allergic Reaction/Anaphylaxis – Paediatric (≤ 15 years)	<p><b>Deleted</b></p> <p>‘Angio-oedema’ from mild allergic signs</p> <p>‘No improvement’ from re-occurs decision diamond</p> <p>‘Asthma’ replaced by ‘bronchospasm’</p> <p><b>Added</b></p> <p>EMT level – all three practitioner levels now combined</p> <p>‘Effective’ to pre-arrival Epinephrine decision diamond</p> <p>‘Poor improvement’ into re-occurs decision diamond (replacing ‘no improvement’)</p> <p>Bradycardia - decision diamond</p> <p>‘Bronchospasm’ replacing ‘asthma’</p> <p>‘Angio-oedema’ to moderate allergic signs</p> <p>‘ABC compromise’ to severe allergic reaction/anaphylaxis signs and symptoms</p> <p>Epinephrine auto injector (1:1,000) (age specific dose) IM</p>

## APPENDIX 4 – CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
CPG 4/5/6.7.31 Allergic Reaction/Anaphylaxis – Paediatric ( $\leq 15$ years) (Contd.)	<b>New Medications</b> Hydrocortisone (age specific dose) IM for paramedic use Chlorphenamine PO/IM/IV
CPG 4/5/6.7.32 Glycaemic Emergency – Paediatric ( $\leq 15$ years)	The algorithm flow through the CPG has been modified  <b>Deleted</b> IV access – decision diamond  <b>Added</b> EMT level – all three practitioner levels now combined 'Conscious/able to swallow' decision diamond for hypoglycaemia Yes - Glucose gel (age specific dose) buccal, sweetened drink No - Dextrose 5 mL/Kg IV or Glucagon (age specific dose) IM 'Advise a carbohydrate meal (sandwich)'
CPG 5/6.7.33 Seizure/Convulsion – Paediatric ( $\leq 15$ years)	<b>Deleted</b> IV access (yes/no) – decision diamond  <b>Medication updates</b> Benzodiazepine - maximum 4 doses regardless of route Consider medical advice if more than 4 doses indicated
CPG 5/6.7.34 Septic Shock – Paediatric ( $\leq 15$ years)	<b>Deleted</b> Benzylpenicillin Commence with 100% O <sub>2</sub>  <b>Added</b> 'advise triage nurse if SIRS + infection' 'On immune-suppressant medication' – Could this be severe infection? 'BP monitoring' O <sub>2</sub> titrate to sats > 95% Penicillin allergy instruction box Pre-alert ED updated with criteria; severe sepsis, septic shock, meningitis suspected or at risk of neutropenia Indications for antibiotic; severe sepsis, septic shock, meningitis suspected or at risk of neutropenia  <b>Medication updates</b> 38.5°C new temperature for consideration for Paracetamol NaCl 0.9% 20 mL/Kg IV/IO repeat prn  <b>New Medications</b> Ceftriaxone (age specific dose) IV/IO/IM Paracetamol (age specific dose) PO/PR/IV

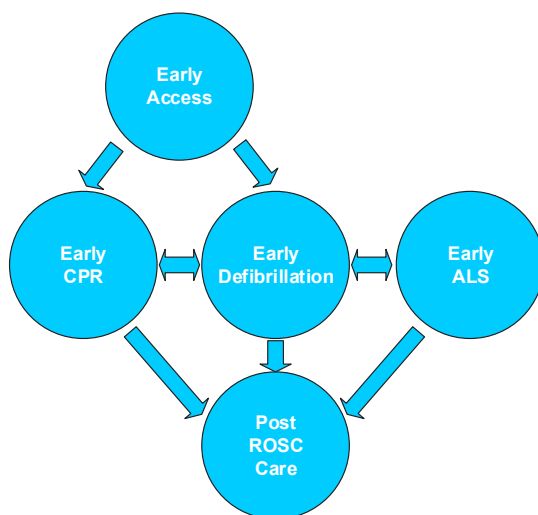
## APPENDIX 4 – CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
CPG 4/5/6.7.35 Pyrexia – Paediatric	<p><b>Deleted</b> Temperature <math>\geq 38^{\circ}\text{C}</math> – decision diamond</p> <p><b>Added</b> Temperature <math>&gt; 38.5^{\circ}\text{C}</math> – decision diamond</p>
CPG 4/5/6.7.50 External Haemorrhage – Paediatric ( $\leq 15$ years)	<p><b>Added</b> 'Consider wound closure clips for temporary closure if still bleeding' – AP, P &amp; EMT-BTEC level</p>

## APPENDIX 5 – Pre-Hospital Defibrillation Position Paper

Defibrillation is a lifesaving intervention for victims of sudden cardiac arrest (SCA). Defibrillation in isolation is unlikely to reverse SCA unless it is integrated into the chain of survival. The chain of survival should not be regarded as a linear process with each link as a separate entity but once commenced with 'early access' the other links, other than 'post-return of spontaneous circulation (ROSC) care', should be operated in parallel subject to the number of people and clinical skills available.

### Cardiac arrest management process



ILCOR guidelines 2015 identified that without ongoing CPR, survival with good neurological function from SCA is highly unlikely. Defibrillators in AED mode can take up to 30 seconds between analysing and charging during which time no CPR is typically being performed. The position below is outlined to ensure maximum resuscitation efficiency and safety.

### Position

#### 1. Defibrillation mode

- 1.1 Paramedics, advanced paramedics, and health care professionals whose scope of practice permits, should use defibrillators in manual mode for all age groups.
- 1.2 EMTs and responders shall use defibrillators in AED mode for all age groups.

#### 2. Hands-off time (time when chest compressions are stopped)

- 2.1 Minimise hands-off time, absolute maximum 10 seconds.
- 2.2 Rhythm and/or pulse checks in manual mode should take no more than 5 to 10 seconds and CPR should be recommenced immediately.
- 2.3 When defibrillators are charging CPR should be ongoing and only stopped for the time it takes to press the defibrillation button and recommenced immediately without reference to rhythm or pulse checks.
- 2.4 It is necessary to stop CPR to enable some AEDs to analyse the rhythm. Unfortunately this time frame is not standard with all AEDs. As soon as the analysing phase is completed and the charging phase has begun CPR should be recommenced.

## APPENDIX 5 – Pre-Hospital Defibrillation Position Paper

### 3. Energy

- 3.1 Biphasic defibrillation is the method of choice.
- 3.2 Biphasic truncated exponential (BTE) waveform energy commencing at 150 to 360 joules shall be used.
- 3.3 If unsuccessful, the energy on second and subsequent shocks shall be as per manufacturer of defibrillator instructions.
- 3.4 Monophasic defibrillators currently in use, although not as effective as biphasic defibrillators, may continue to be used until they reach the end of their lifespan.

### 4. Safety

- 4.1 For the short number of seconds while a patient is being defibrillated, no person should be in contact with the patient.
- 4.2 The person pressing the defibrillation button is responsible for defibrillation safety.
- 4.3 Defibrillation pads should be used as opposed to defibrillation paddles for pre-hospital defibrillation.

### 5. Defibrillation pad placement

- 5.1 The right defibrillation pad should be placed mid-clavicular directly under the right clavicle.
- 5.2 The left defibrillation pad should be placed mid-axillary with the top border directly under the left nipple. If the defibrillation pads are oblong the pad should be placed in the horizontal line of the body.
- 5.3 If a pacemaker or Implantable Cardioverter Defibrillator (ICD) is fitted, defibrillator pads should be placed at least 8 cm away from these devices. This may result in anterior and posterior pad placement which is acceptable.

### 6. Paediatric defibrillation

- 6.1 Paediatric defibrillation refers to patients less than 8 years of age.
- 6.2 Manual defibrillator energy shall commence and continue with 4 joules/Kg.
- 6.3 AEDs should use paediatric energy attenuator systems.
- 6.4 If a paediatric energy attenuator system is not available, an adult AED may be used.
- 6.5 It is extremely unlikely to ever have to defibrillate a child less than 1-year-old. Nevertheless, if this were to occur the approach would be the same as for a child over the age of 1. The only likely difference being, the need to place the defibrillation pads anterior and posterior, because of the infant's small size.

### 7. Implantable Cardioverter Defibrillator (ICD)

- 7.1 If an Implantable Cardioverter Defibrillator (ICD) is fitted in the patient, treat as per CPG. It is safe to touch a patient with an ICD fitted even if it is firing.

### 8. Cardioversion

- 8.1 Advanced Paramedics are authorised to use synchronised cardioversion for unresponsive patients with a tachyarrhythmia greater than 150.
- 8.2 For narrow complexes commence cardioversion at 50 joules.
- 8.3 For wide complexes commence cardioversion at 100 joules.
- 8.4 If unsuccessful with cardioversion escalate energy by 50 joules.



## APPENDIX 6 – Spinal Injury Management Recommendations

### Pre-Hospital Spinal Injury Management – PHECC standard

#### Introduction

The Pre-Hospital Emergency Care Council (PHECC) has a unique position internationally in pre-hospital emergency care as it sets not only practitioner standards but also responder standards. A seminar was hosted by PHECC in 2015 at which international and national speakers gave their perspective on pre-hospital spinal injury management. The Centre for Prehospital Research (C.P.R.) at the University of Limerick (UL) was tasked to complete a systematic literature review on pre-hospital spinal injury management, the results of which were presented at the seminar. The seminar was followed by surveys of PHECC Facilitators, Tutors, Assistant Tutors, Consultants in Emergency Medicine and Chief Fire Officers on pre-hospital spinal injury management. The information collated helped to inform the Medical Advisory Committee in making the recommendations on pre-hospital spinal injury management to Council.

The recommendations set out in this Appendix are for Paramedics and Advanced Paramedics. The full details are published in STN024 and are available on the PHECC website [www.phecc.ie](http://www.phecc.ie)

#### Recommendations

##### Practitioners at Paramedic and Advanced Paramedic level

##### Recommendation 1

Change terminology from 'spinal immobilisation' to 'spinal motion restriction' when referring to the management of pre-hospital spinal injuries.

The aim of this recommendation is to instigate a change of culture and allow practitioners to consider alternative methods of patient extrication and packaging.

##### Recommendation 2

Following trauma should any of the following factors be present:

- dangerous mechanism of injury
- fall from a height of greater than 1 metre or 5 steps
- axial load to the head or base of the spine – for example diving, high-speed motor vehicle collision, rollover motor accident, ejection from a motor vehicle, accident involving motorised recreational vehicle, bicycle collision, horse riding accident, pedestrian v vehicle
- impaired awareness (alcohol/drug intoxication, confused/uncooperative or ALoC)
- age 65 years or older, with any of the above
- age 2 years or younger, incapable of verbal communication, with any of the above the patient should be regarded as 'high risk' and have active spinal motion restriction applied until assessment is complete

There are two aims to this recommendation: the first is to ensure that 'high risk' patients minimise movement until a detailed assessment occurs: the second allows an informed decision about the most appropriate method of patient extrication and packaging, even though the patient has initially presented as 'high risk'.

## APPENDIX 6 – Spinal Injury Management Recommendations

### Recommendation 3

**Following trauma, if no 'high risk' factors are present, and where any two or more of the following factors are present:**

- involved in a minor rear-end motor vehicle collision
- comfortable in a sitting position
- ambulatory at any time since the injury
- no midline cervical spine tenderness
- no spinal column/midline pain

**and are able to actively rotate their neck 45 degrees to the left and right, the patient should be regarded as 'low risk' and have passive spinal motion restriction applied until assessment is complete.**

The aim of this recommendation is to ensure that practitioners are confident to permit 'low risk' patients to self-splint or have passive support until a detailed assessment enables an informed decision in relation to the most appropriate method of patient extrication and packaging.

### Recommendation 4

**Following a trauma assessment, should a patient present with any of the following 'spinal injury rule in' considerations:**

- any significant distracting injuries
- impaired awareness (alcohol/drug intoxication, confused/uncooperative or ALoC)
- immediate onset of spinal/midline back pain
- hand or foot weakness (motor issue)
- altered or absent sensation in the hands or feet (sensory issue)
- priapism
- history of spinal problems, including previous spinal surgery or conditions that predispose to instability of the spine
- unable to actively rotate their neck 45 degrees to the left and right (P & AP only)

**or an appropriate assessment cannot be completed, a 'spinal injury rule in' shall apply.**

**Active spinal motion restriction shall thereafter be implemented until arrival at ED.**

The aims of recommendation 4 are to identify the 'spinal injury rule in' considerations for active spinal motion restriction and to increase awareness that appropriate patient assessment may not be feasible in all circumstances when making the decision on spinal motion restriction.

### Recommendation 5

**Uncooperative patients shall not be forced into active spinal motion restriction as this is a greater risk to the patient.**

The aim of recommendation 5 is to ensure that additional unnecessary motion is not applied to a potentially unstable injury through forced spinal motion restriction.

## APPENDIX 6 – Spinal Injury Management Recommendations

### Recommendation 6

**There is no requirement to carry out or maintain active or passive spinal motion restriction following trauma if patients:**

- are deemed to have minimal risk factors
- do not present with any of the 'spinal injury rule in' considerations
- are pain free and are able to actively rotate their neck 45 degrees left and right

The aim of recommendation 6 is to enable practitioners be confident to exclude a potential spinal injury for patients with 'minimal risk' and without 'spinal injury rule in' considerations.

### Recommendation 7

**If a decision is made, after the primary survey is complete and significant injuries stabilised, to continue active spinal motion restriction, a rigid cervical collar may be considered at this point prior to lifting/moving the patient.**

The aim of recommendation 7 is to ensure that 'high risk' patients and 'low risk' patients with 'spinal injury rule in' considerations present have minimised cervical spine movement during initial assessment and that cervical collar application is a secondary process.

### Recommendation 8

**If mechanism of injury suggests a possible isolated lumbar or thoracic injury without cervical injury involved, cervical motion restriction is not indicated.**

The aim of recommendation 8 is to remove the requirement for practitioners to apply cervical motion restriction for isolated thoracic or lumbar trauma.

### Recommendation 9

**Patients with 'high' or 'low risk' factors and in the absence of 'spinal injury rule in' considerations may be requested to self-extricate from a vehicle and be instructed to lie down on a trolley stretcher in a position of comfort.**

**For patients not meeting these criteria, use active spinal motion restriction practice for extrication.**

The aim of recommendation 9 is to permit practitioners to implement self-extrication techniques for 'high risk' and 'low risk' patients who present without 'spinal injury rule in' considerations.

### Recommendation 10

**If a patient with a suspected spinal injury is ambulatory following trauma, request the patient lies down on the trolley stretcher if he/she is able to do so. If unable to comply, consider alternative methods.**

The aim of recommendation 10 is to remove 'standing take down' as the standard of care for ambulatory patients.

## APPENDIX 6 – Spinal Injury Management Recommendations

### Recommendation 11

**Supine patients with suspected spinal injuries, where active spinal motion restriction is being continued, should be lifted with a split device in preference to a log roll.**

The aim of recommendation 11 is to minimise unnecessary patient movement, particularly on multisystem trauma/pelvic injury patients to avoid clot disruption, for packaging.

### Recommendation 12

**A long board is primarily an extrication device and should be used primarily for this purpose.**

The aim of recommendation 12 is to minimise secondary injury and discomfort for patients by strongly discouraging the practice of transport on long board.

### Recommendation 13

**The preferred mode for the transport of a patient with active spinal motion restriction is on a vacuum mattress. It is acknowledged that other devices may be utilised.**

The aim of recommendation 13 is, following international evidence, to promote the use of vacuum mattress as the preferred option for transport of patients with query spinal injury.

### Recommendation 14

**Patients presenting with penetrating trauma and without neurological signs should not have spinal motion restriction applied. Rapid transport to ED is essential to reduce mortality.**

The aim of recommendation 14 is to minimise on-scene times for treatment and packaging of penetrating trauma patients.

### Recommendation 15

**For patients with non-standard spinal anatomy e.g. ankylosing spondylitis, permit them to find a position where they are comfortable with manual spinal motion restriction. Non-standard methods such as rolled blankets may be utilised to accomplish spinal motion restriction.**

The aim of recommendation 15 is to enable practitioners to use their judgement to package the patient appropriately for the patient's individual needs and particularly to reduce the incidence of inappropriate use of rigid cervical collars and other spinal injury devices on patients with non-standard spinal anatomy.

### Recommendation 16

**When possible, the highest PHECC registered practitioner level on-scene will determine if spinal motion restriction is to be used or discontinued i.e. cease active spinal motion restriction.**

The aim of recommendation 16 is to enable practitioners to use their clinical judgement to discontinue active spinal motion restriction initiated by another practitioner or responder.

## APPENDIX 6 – Spinal Injury Management Recommendations

### Recommendation 17

Paediatric patients following trauma should be assessed for spinal injury using the 'spinal injury rule in' considerations.

The aim of recommendation 17 is to enable the practitioner to assess and package the paediatric trauma patient using the adult criteria for spinal motion restriction. However, clinical judgement should err on the side of caution due to difficulties with assessment of paediatric trauma.

### Recommendation 18

The preferred mode for the transport of a paediatric patient with active spinal motion restriction is on a vacuum mattress or appropriately sized vacuum device. It is acknowledged that other options may be used.

Non-standard methods such as rolled blankets may be utilised to accomplish spinal motion restriction.

The aim of recommendation 18 is to enable vacuum mattress to be used as the primary option for spinal motion restriction for paediatric patients.

### Recommendation 19

Uncooperative paediatric patients shall not be forced into active spinal motion restriction as this is a greater risk to the patient.

The aim of recommendation 19 is to ensure that distressed or uncooperative paediatric patients are supported in a position of comfort and not have forced active spinal motion restriction applied.

### Recommendation 20

Very young conscious paediatric patients with suspected spinal injury may have spinal motion restriction applied using the child's own car seat if it is intact following a collision, however they should not be forced into this position.

The aim of recommendation 20 is to enable undamaged child car seats to be used for spinal motion restriction for appropriately aged paediatric patients.

Paramedic and Advanced Paramedic level	Mechanism of injury	
	High Risk	Low Risk
'Spinal injury rule in' considerations	Active SMR	Active SMR
No 'spinal injury rule in' considerations	Passive SMR	Passive SMR

# ADVANCED PARAMEDIC

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Published by:  
Pre-Hospital Emergency Care Council  
Abbey Moat House, Abbey Street,  
Naas, Co. Kildare, W91 NN9V, Ireland.

Phone: +353 (0)45 882042  
Fax: +353 (0)45 882089

Email: [info@phecc.ie](mailto:info@phecc.ie)  
Web: [www.phecc.ie](http://www.phecc.ie)