Clinical Practice Guidelines - 2017 Edition
(UPDATED FEBRUARY 2018)

ADVANCED PARAMEDIC

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.

PHECC Clinical Practice Guidelines

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CLINICAL PRACTICE GUIDELINES

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 Zelie 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.

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_2
Cardiopulmonary Resuscitation	CPR
Cervical Spine	C-spine
Chronic Obstructive Pulmonary Disease	COPD
Clinical Practice Guideline	CPG
Continuous Positive Airway Pressure	CPAP
Degree	^{o}
Degrees Centigrade	^{o}C
Dextrose 10% in water	$D_{10}W$
Dextrose 5% in water	D_5W
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+ ion concentration	pH
Orally (per os)	PO
Oropharyngeal airway	OPA
Oxygen	O_2
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_2
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.

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An extra special thanks to all the PHECC team who were involved in this project, especially Ms Margaret Bracken and Ms Deirdre Borland for their painstaking recording of details and organisational skills.

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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.

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

Feedback on the CPGs may be sent to 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

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 (≤) 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.

INDEX Advanced Paramedic CPGs

CLINICAL PRACTICE GUIDELINES for ADVANCED PARAMEDIC

(CODES EXPLANATION)

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

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

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

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

Sequence step — **A sequence (skill) to be performed**

Mandatory sequence step — **A mandatory sequence (skill) to be performed**

A decision process
The Practitioner must follow one route

Consider treatment options — Given the clinical presentation consider the treatment option specified

xyz — Finding following clinical assessment, leading to treatment modalities

Reassess — Reassess the patient following intervention

4/5/6.4.1
Version 2, 07/11

4/5/6.x.y
Version 2, mm/yy

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

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

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

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

Paramedic or lower clinical levels not permitted this route

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

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

Instructions — **An instruction box for information**

Special instructions — **Special instructions**
Which the Practitioner must follow

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

Consider Medical Support — Consider medical support

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

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

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

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

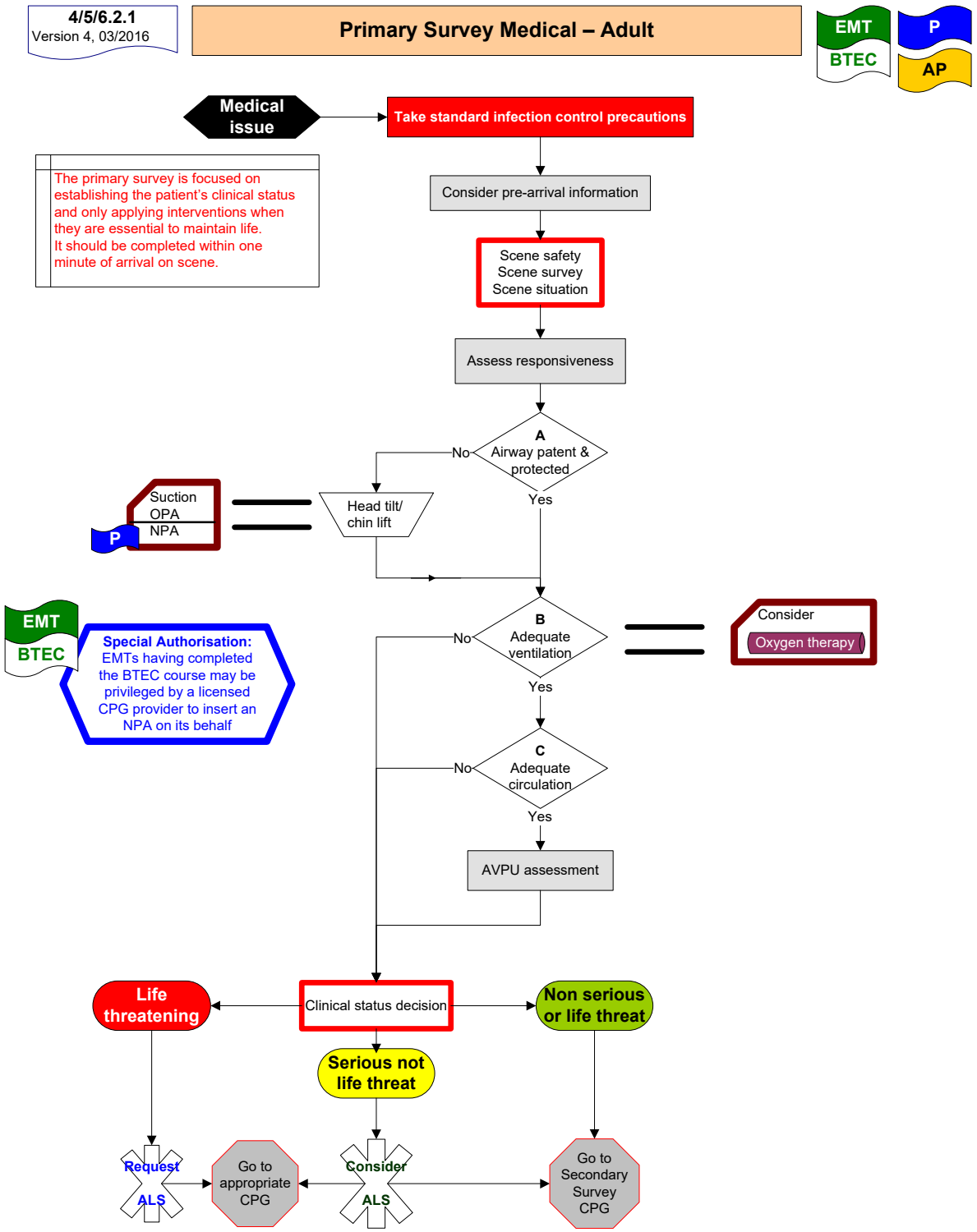
Start from — **A clinical condition that may precipitate entry into the specific CPG**

SECTION 1 - Care Principles (Practitioner)

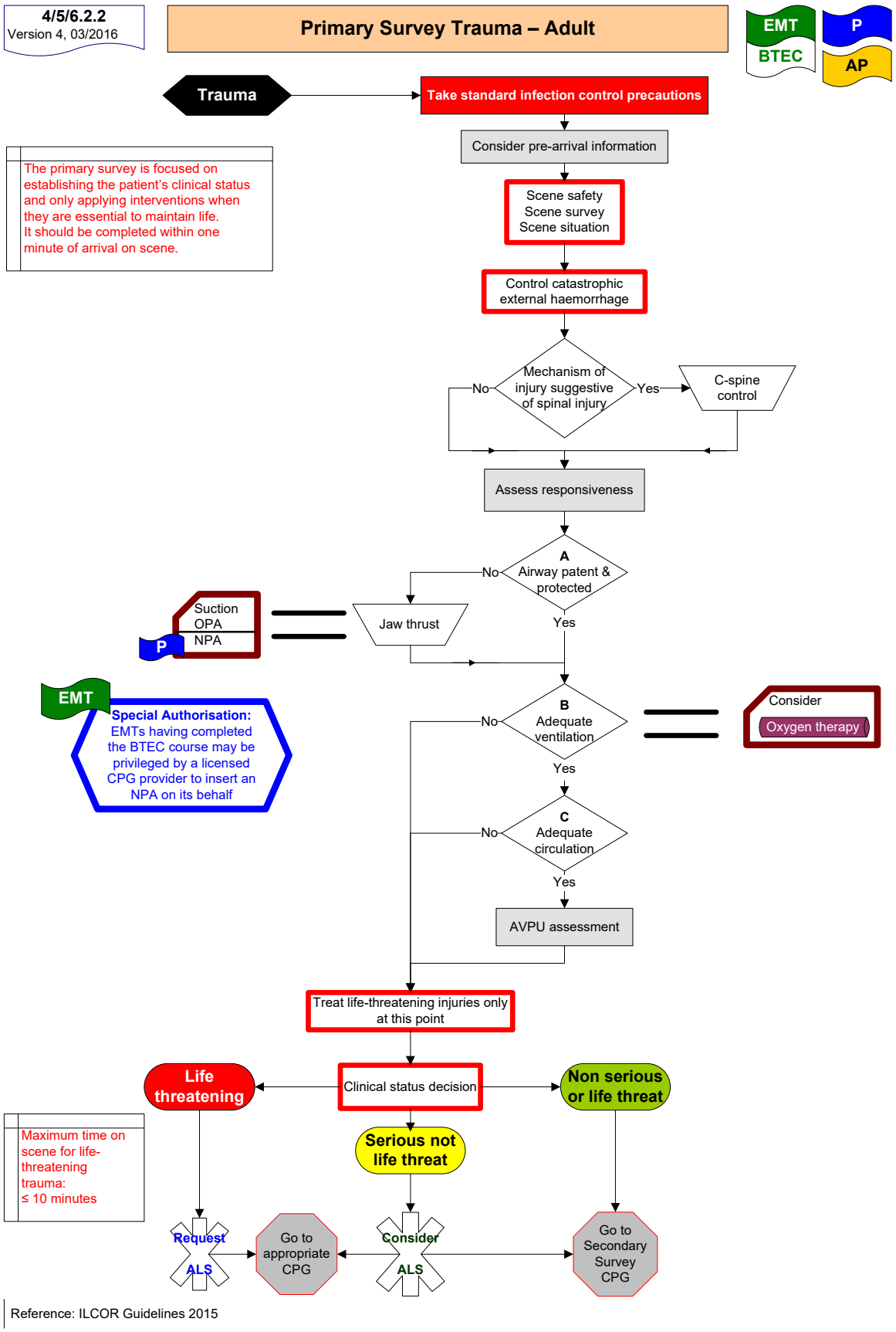
Care principles are goals of care that apply to all patients. Scene safety, standard precautions, patient assessment, primary and secondary surveys and the recording of interventions and medications on the Patient Care Report (PCR) or the Ambulatory Care Report (ACR), are consistent principles throughout 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.



Reference: ILCOR Guidelines 2015



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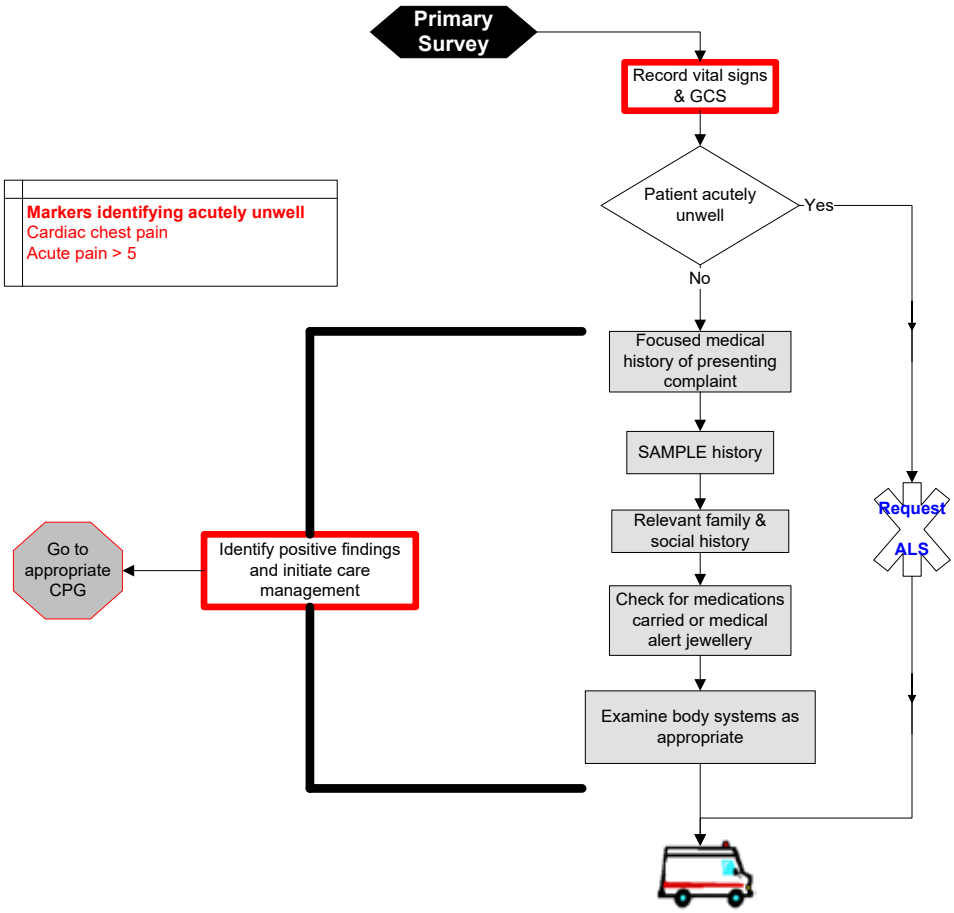
5/6.2.4
Version 2, 09/2011

Secondary Survey Medical – Adult

P AP

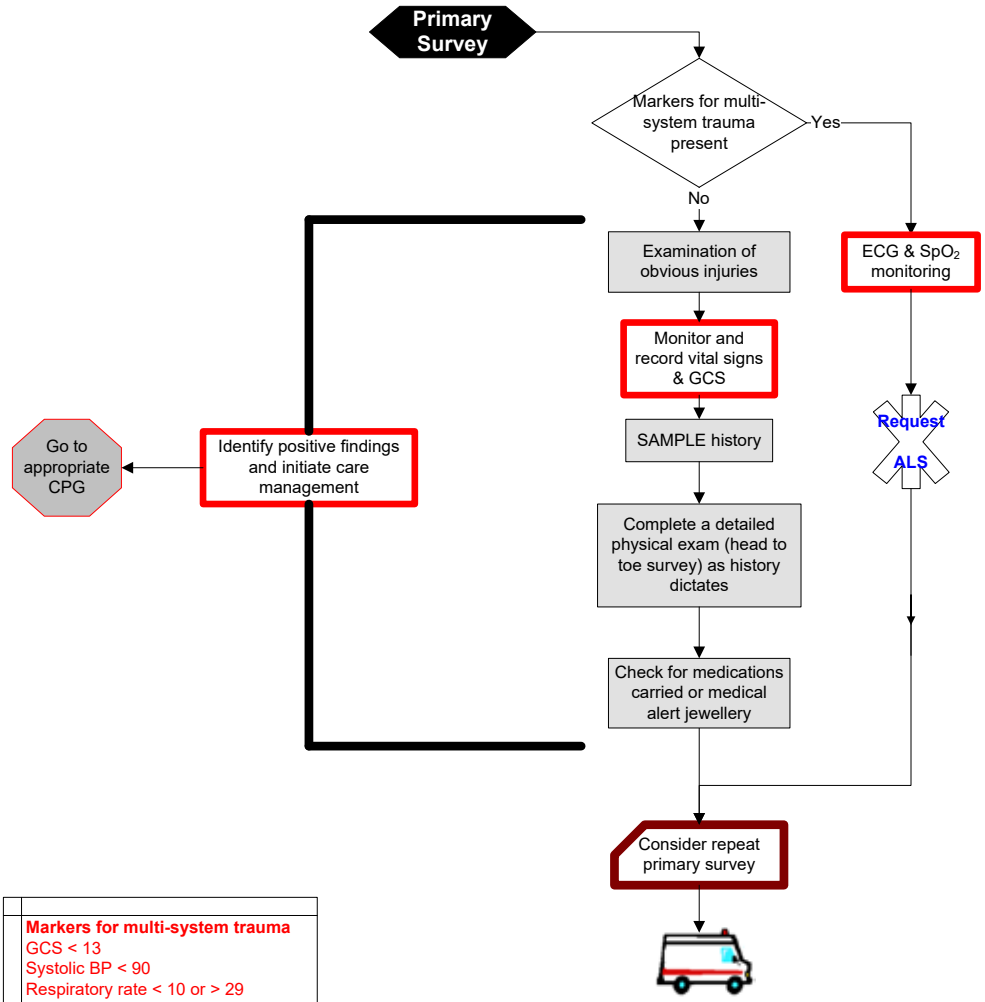


Reference: Sanders, M. 2001, Paramedic Textbook 2nd Edition, Mosby
Gleadle, J. 2003, History and Examination at a glance, Blackwell Science
Rees, JE, 2003, Early Warning Scores, World Anaesthesia Issue 17, Article 10

5/6.2.5
Version 2, 01/2013

Secondary Survey Trauma – Adult

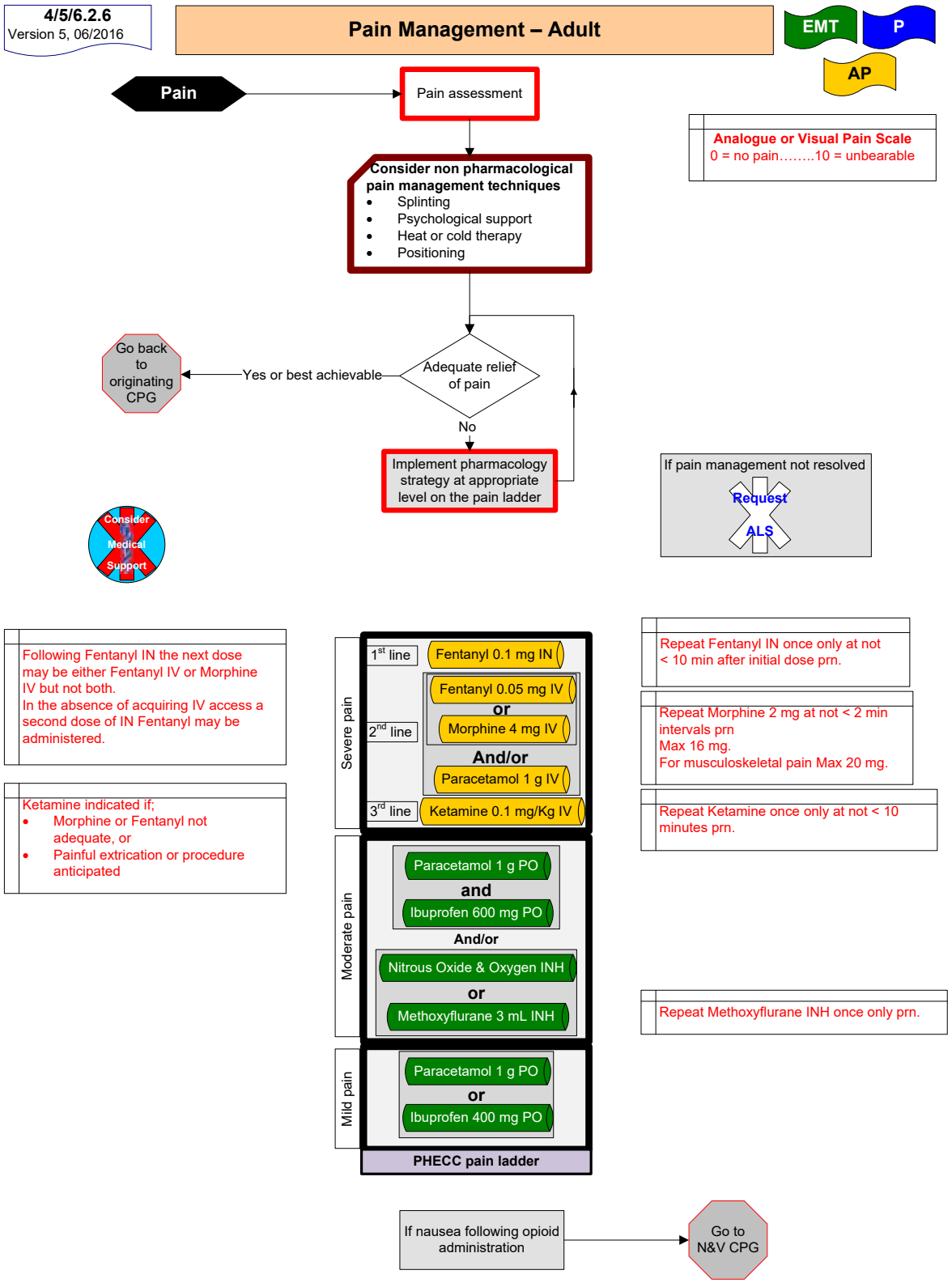
P AP



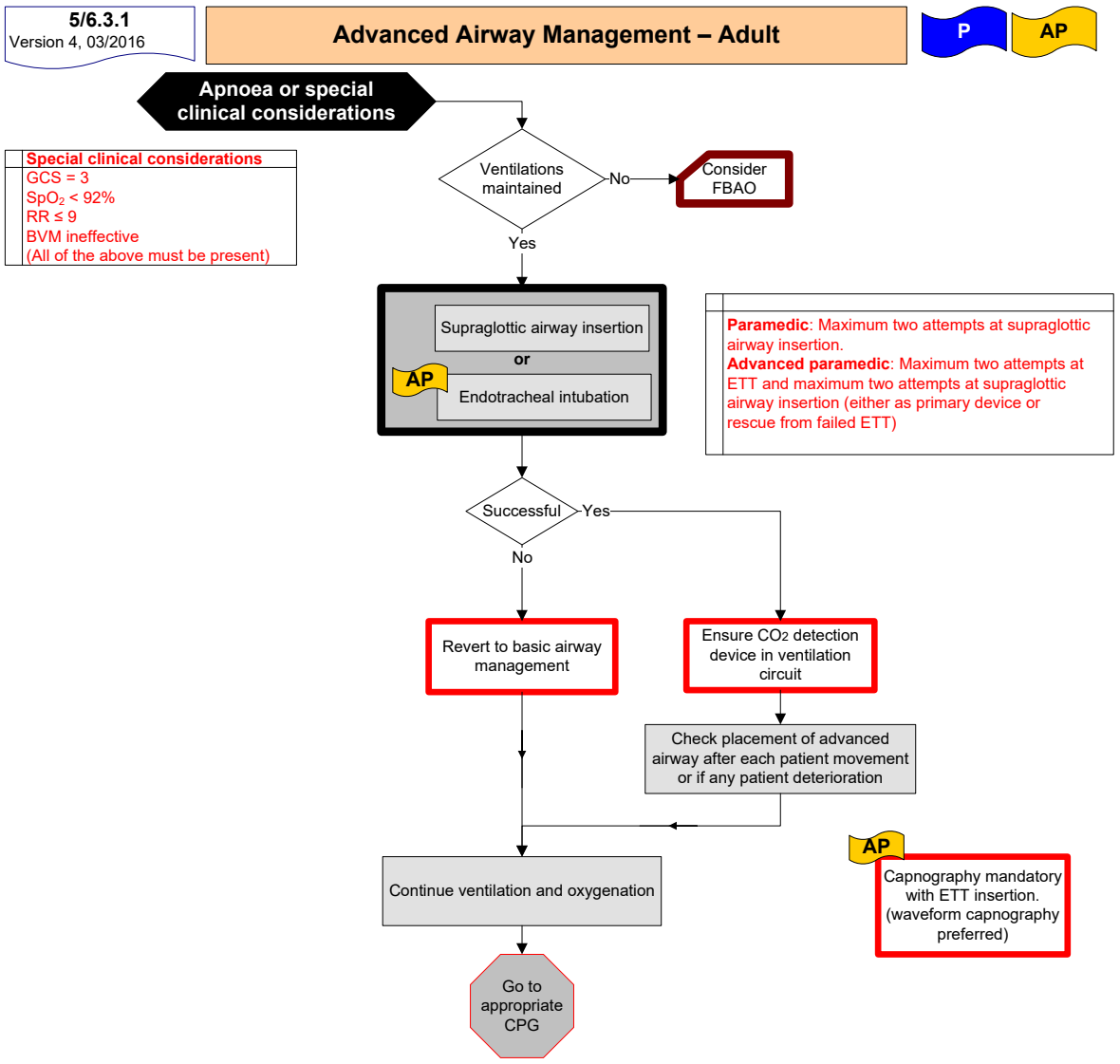
Markers for multi-system trauma
GCS < 13
Systolic BP < 90
Respiratory rate < 10 or > 29
Heart rate > 120
Revised Trauma Score < 12
Mechanism of Injury

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		

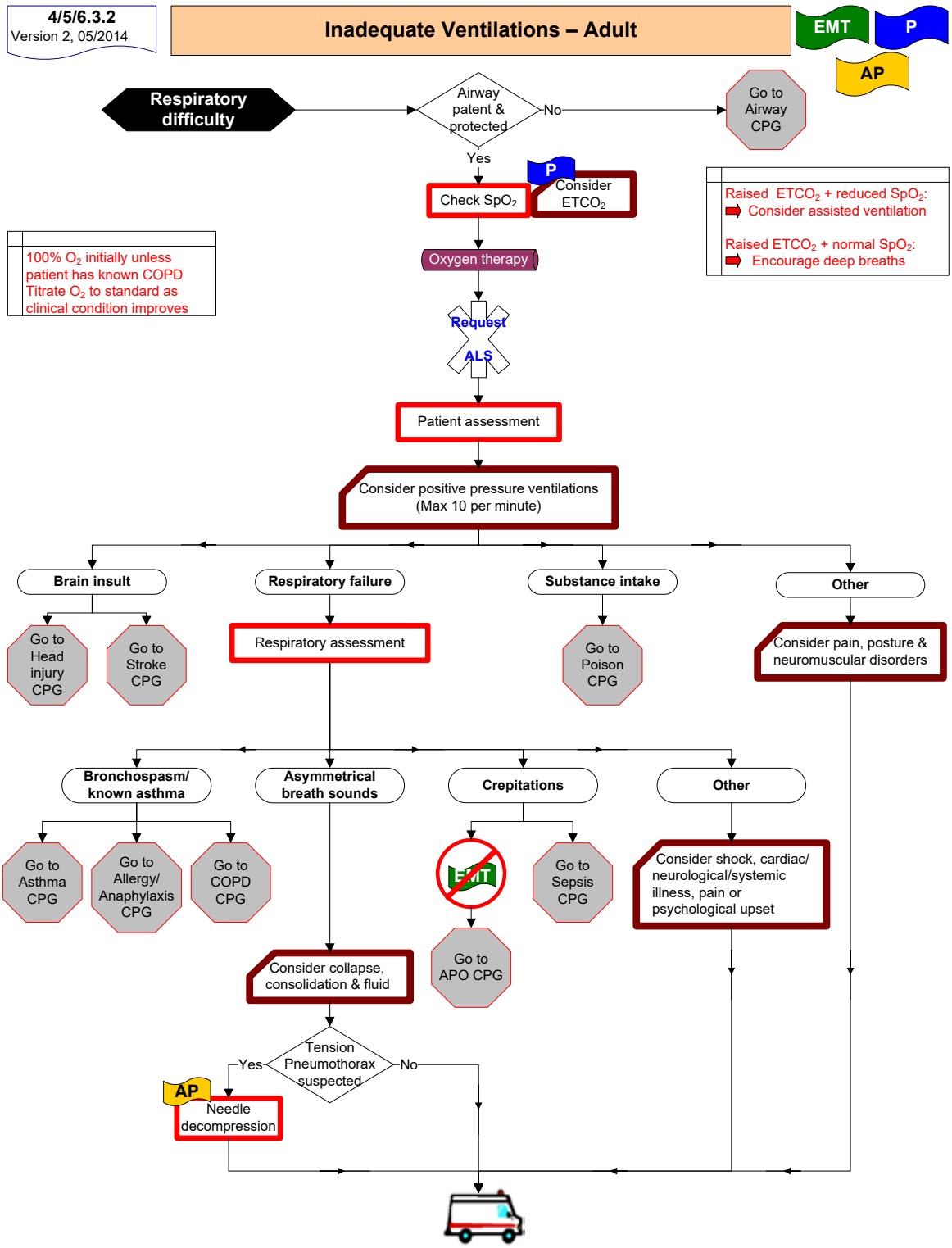
Reference: McSwain, N. et al, 2011, PHTLS Prehospital Trauma Life Support, 7th Edition, Mosby



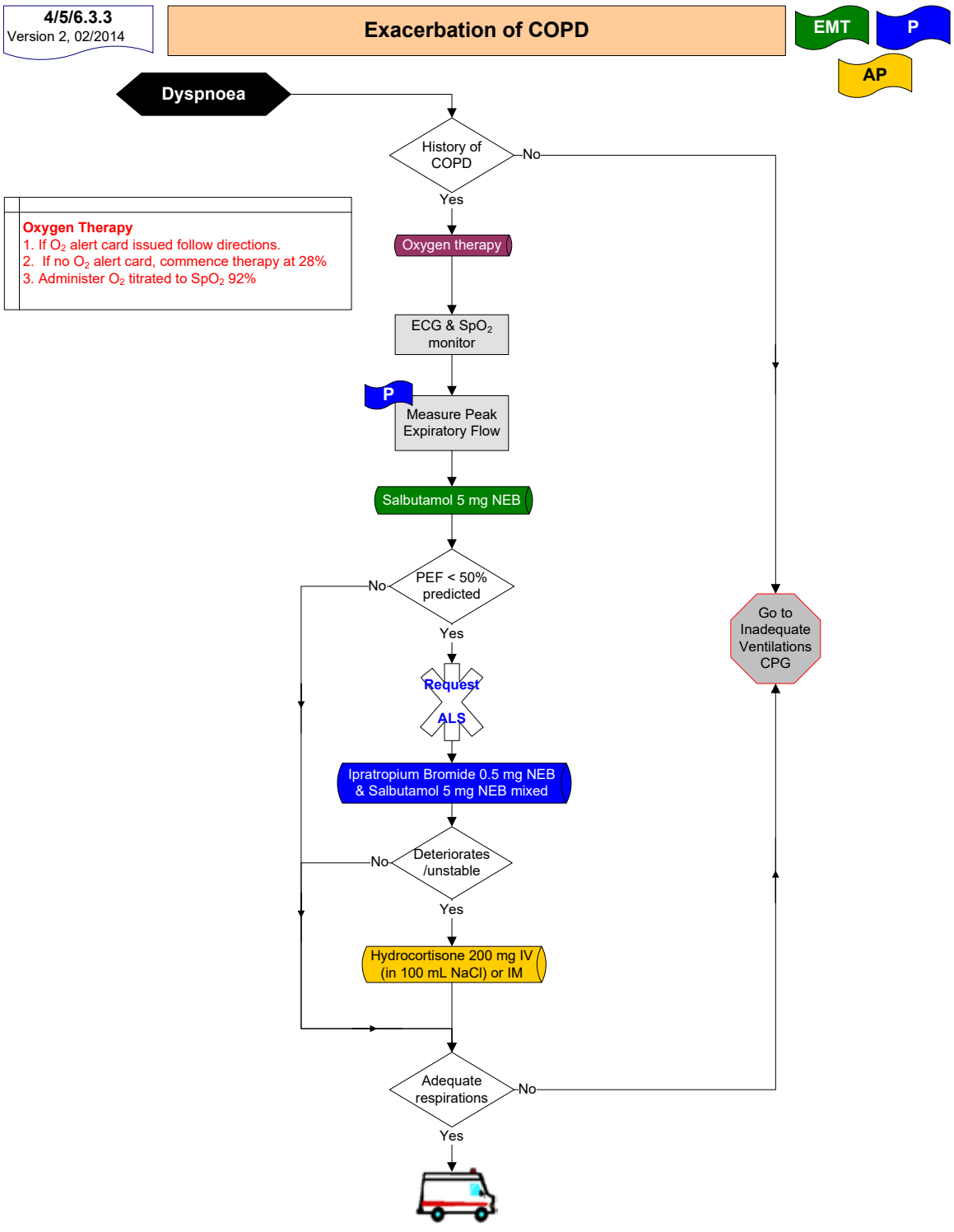
Reference: Coffey, F., et al. (2014). "STOP!: a randomised, double-blind, placebo-controlled study of the efficacy and safety of methoxyflurane for the treatment of acute pain." Emerg Med J **31**(8): 613-618
Jennings, P. A., et al. (2011). "Ketamine as an analgesic in the pre-hospital setting: a systematic 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



Reference: ILCOR Guidelines 2015



Pre-Hospital Emergency Care Council



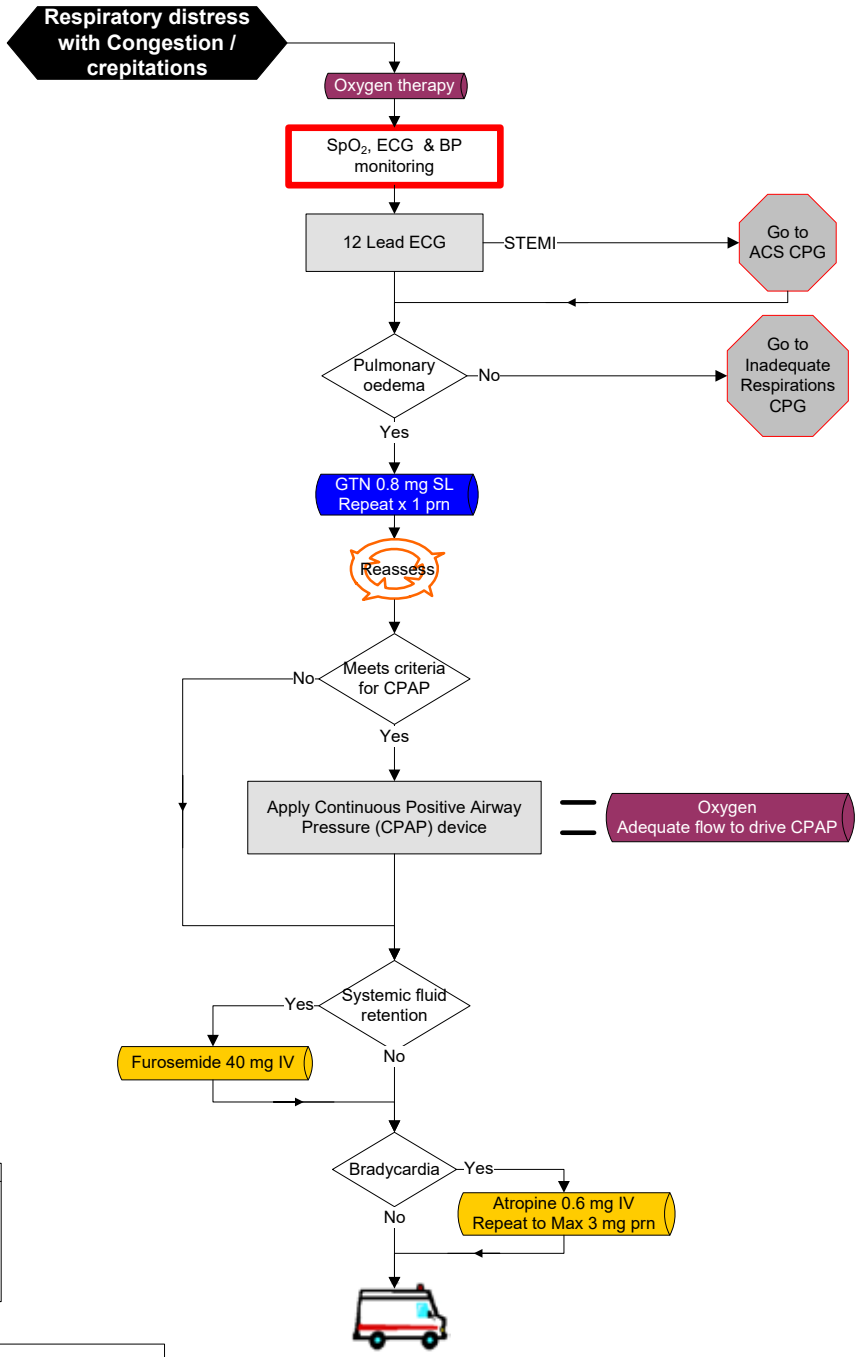
An exacerbation of COPD is defined as;
An event in the natural course of the disease characterised by a change in the patient's baseline dyspnoea, cough and/or sputum beyond day-to-day variability sufficient to warrant a change in management. (European Respiratory Society)

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

5/6.3.5
Version 1, 12/2013

Acute Pulmonary Oedema – Adult

P AP

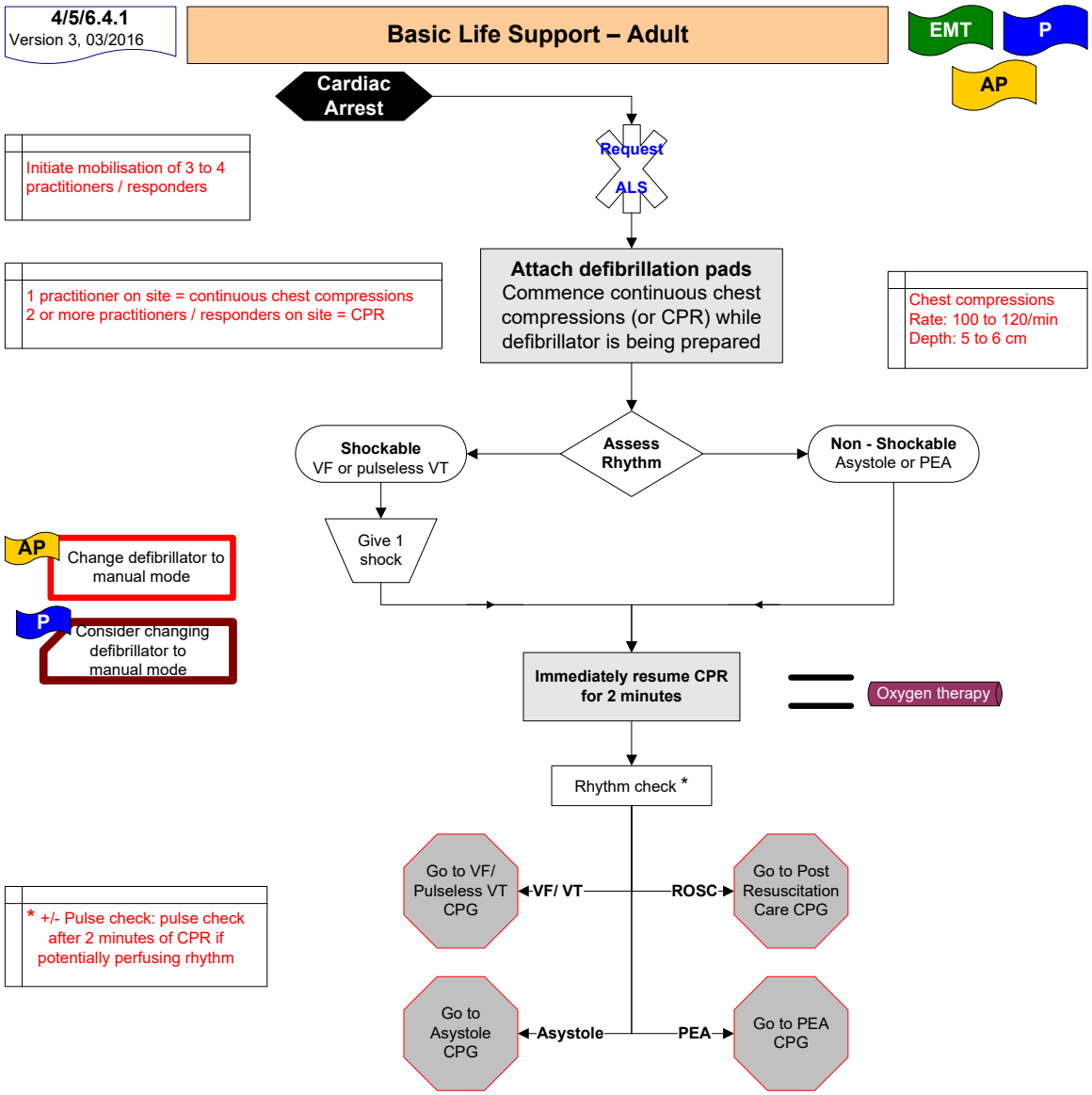


Criteria for CPAP
Clinical signs of APO
RR > 25 per min
SpO_2 < 90%

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

CPAP
Commence with 5 cm H_2O
Titrate up to 10 cm H_2O as tolerated
Monitor clinical response
Titrate O_2 to maintain SpO_2 > 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.



Ventilations
Volume: 500 to 600 mL

Minimum interruptions of chest compressions

Maximum hands off time 10 seconds

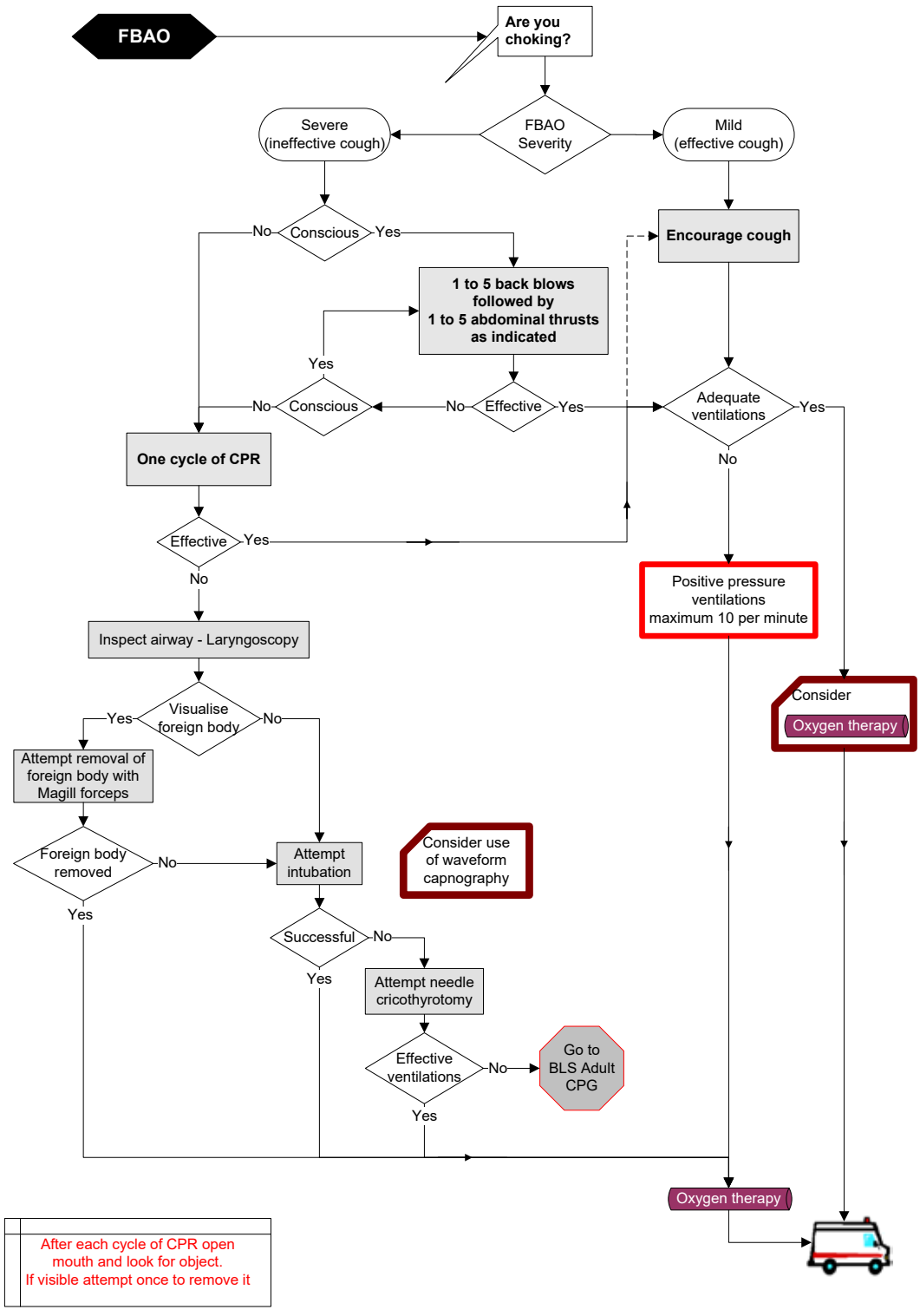
If an Implantable Cardioverter Defibrillator (ICD) is fitted in the patient treat as per CPG. It is safe to touch a patient with an ICD fitted even if it is firing

Reference: ILCOR Guidelines 2015

6.4.2
Version 3, 03/2016

Foreign Body Airway Obstruction – Adult

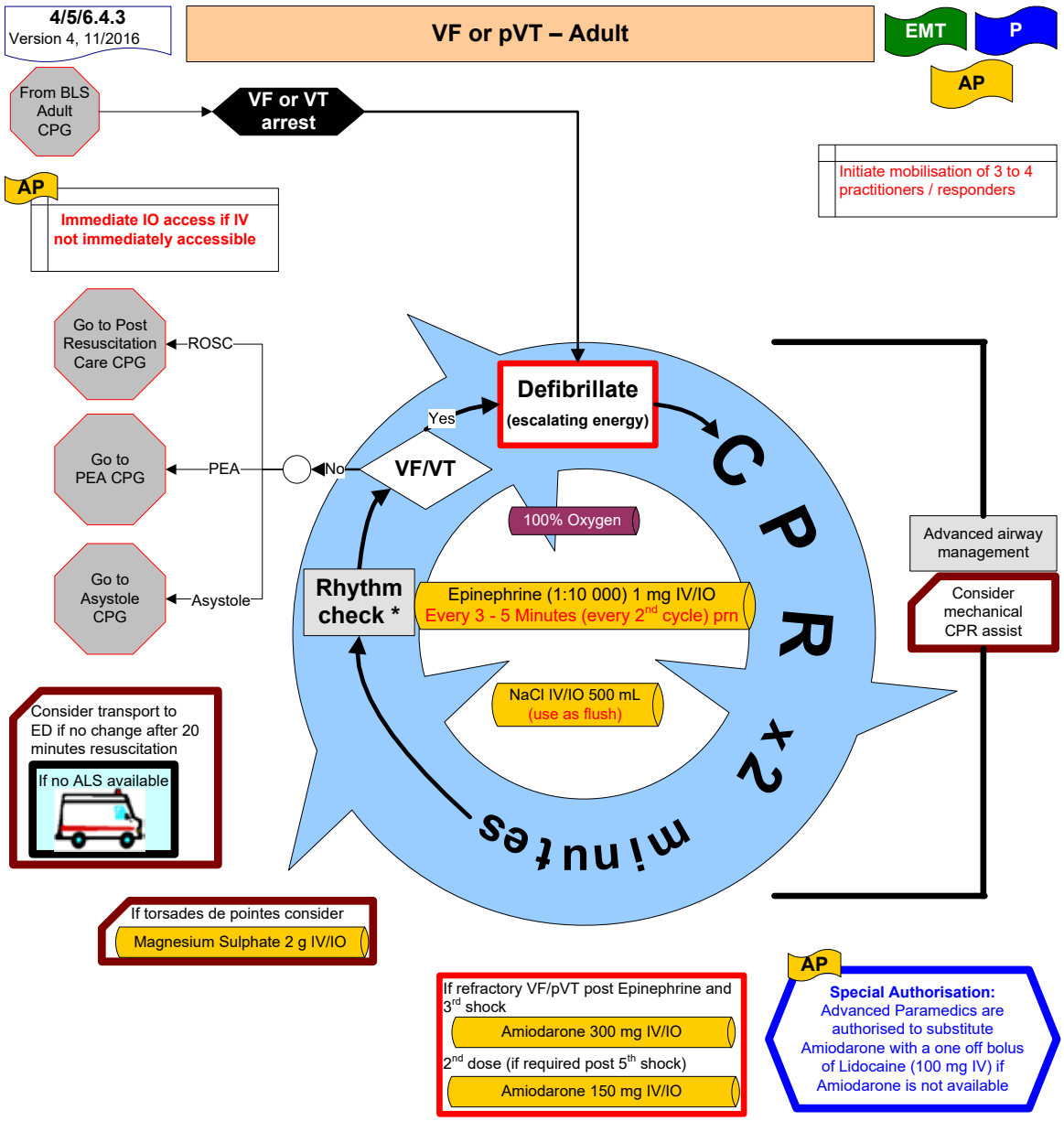
AP



After each cycle of CPR open mouth and look for object.
If visible attempt once to remove it

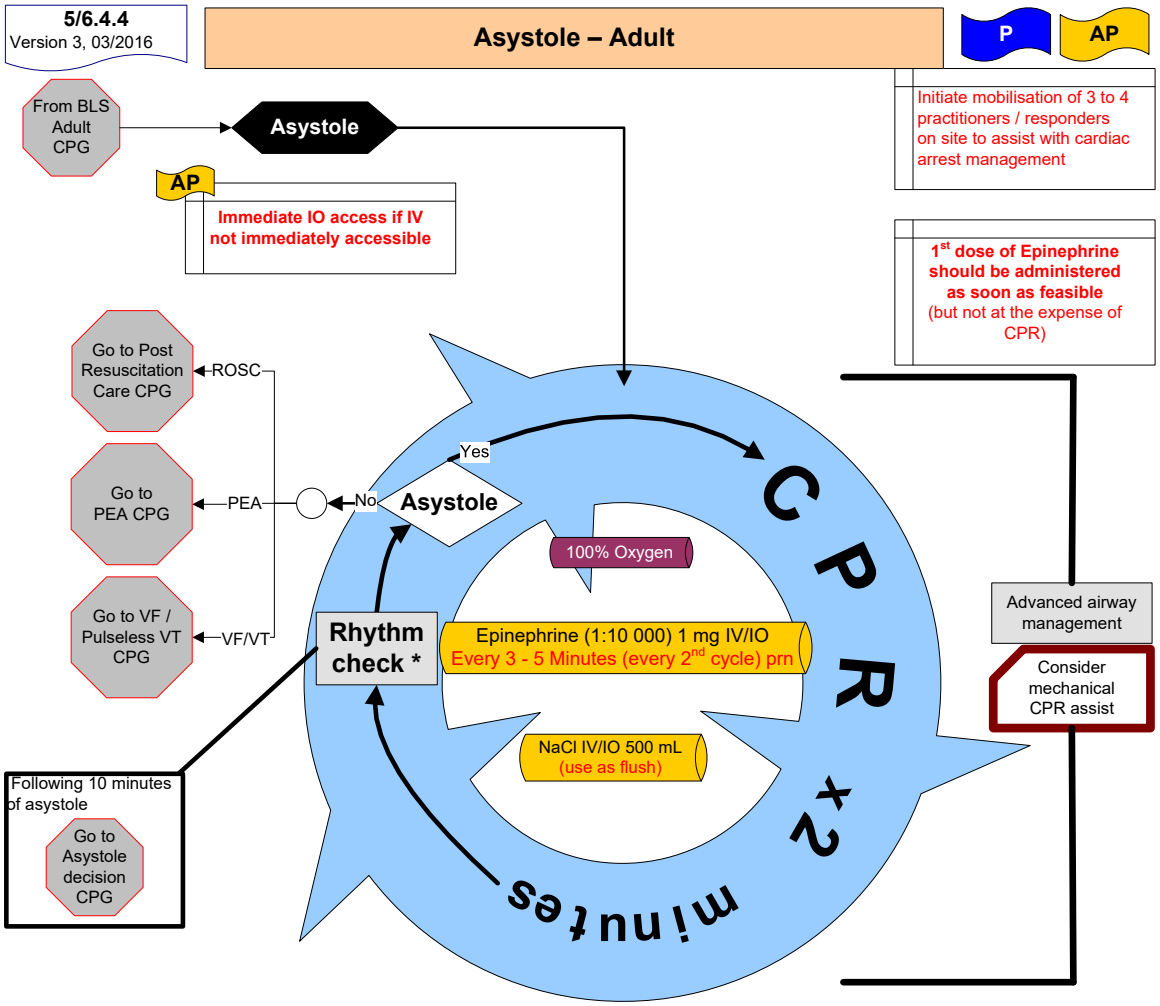
Reference: ILCOR Guidelines 2015

Pre-Hospital Emergency Care Council



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

Reference: ILCOR Guidelines 2015



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

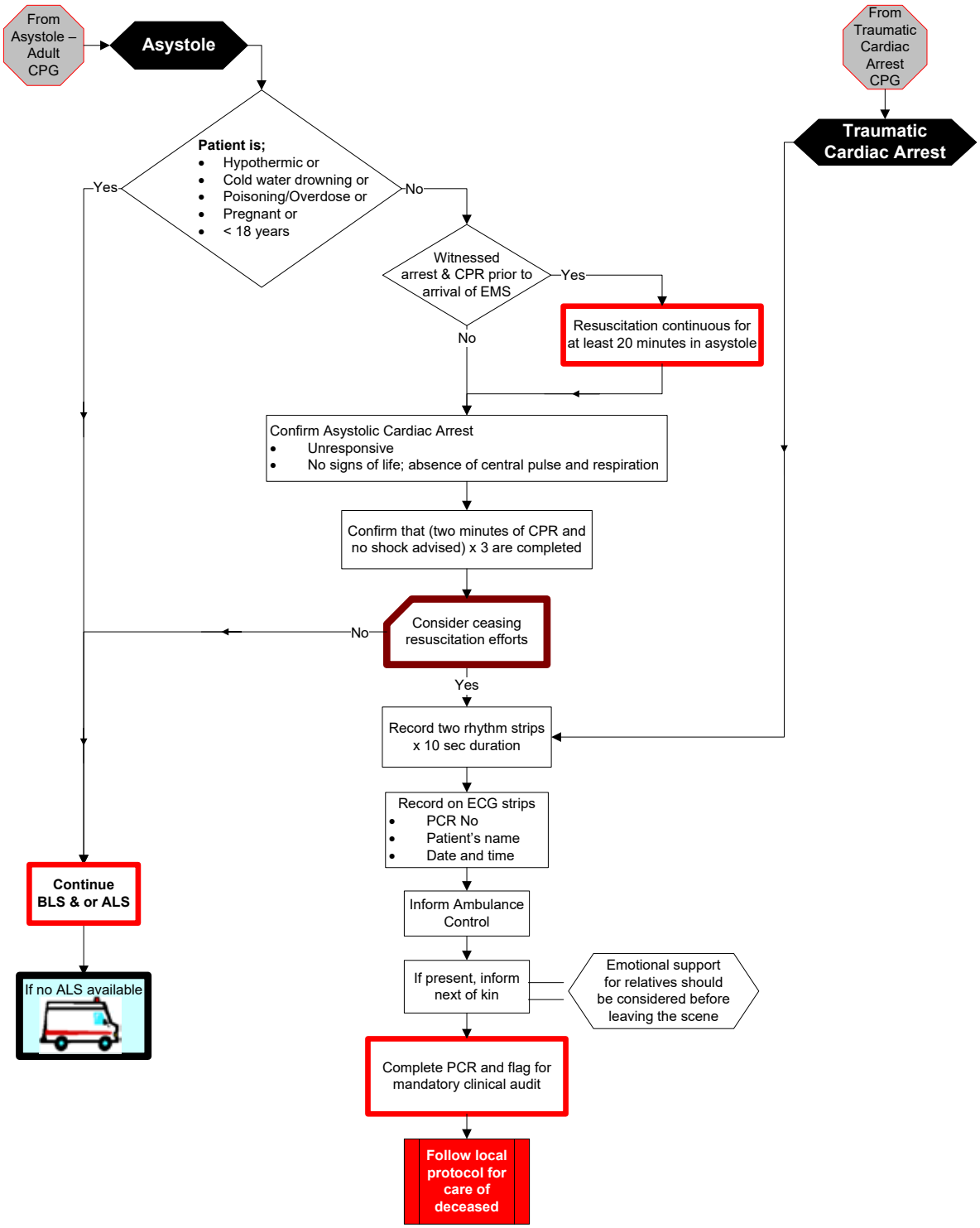
* +/- Pulse check: pulse check after 2 minutes of CPR if potentially perfusing rhythm

Reference: ILCOR Guidelines 2015

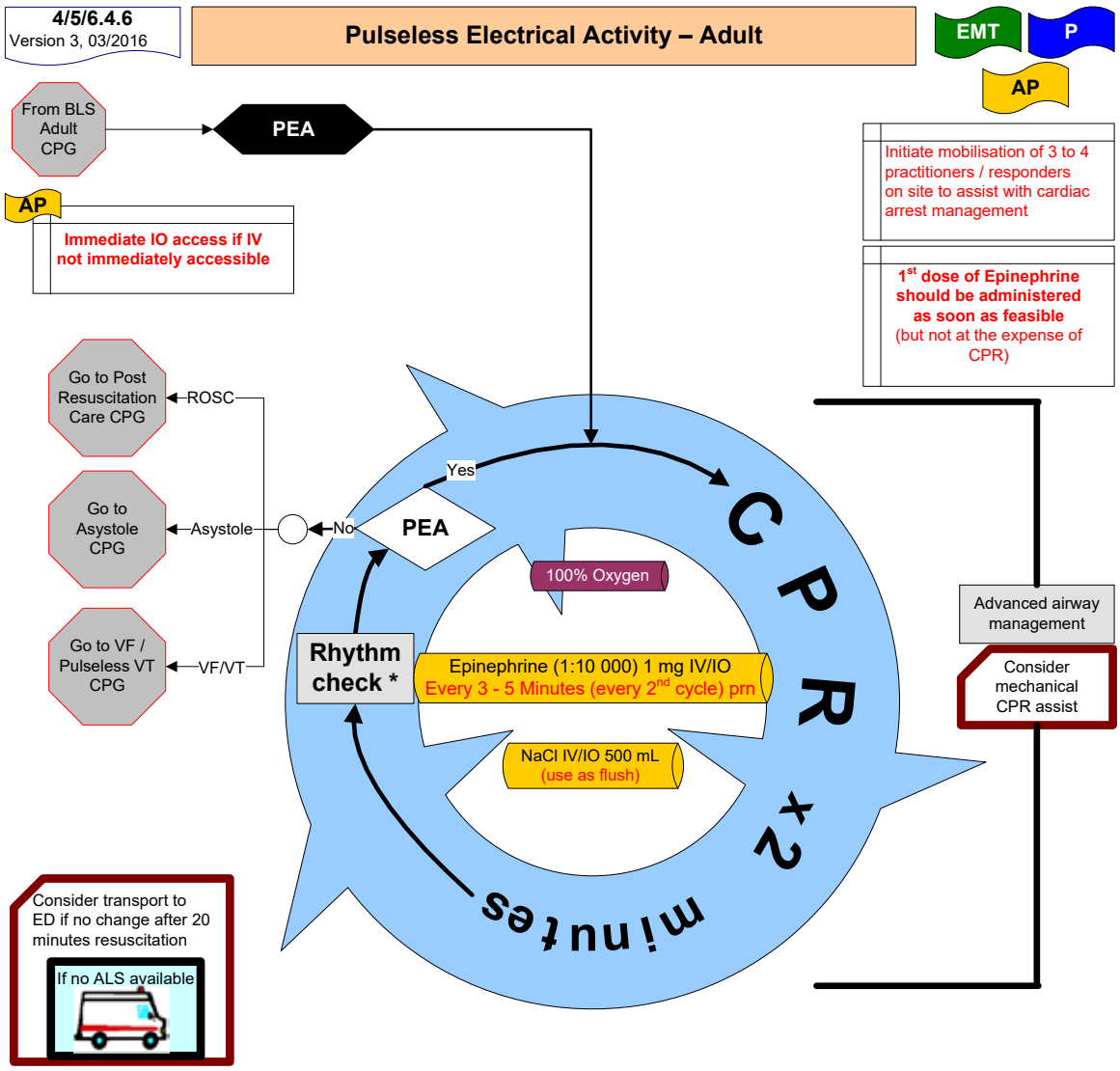
5/6.4.5
Version 1, 05/2008

Asystole - Decision Tree

P AP



Pre-Hospital Emergency Care Council



Consider causes and treat as appropriate:

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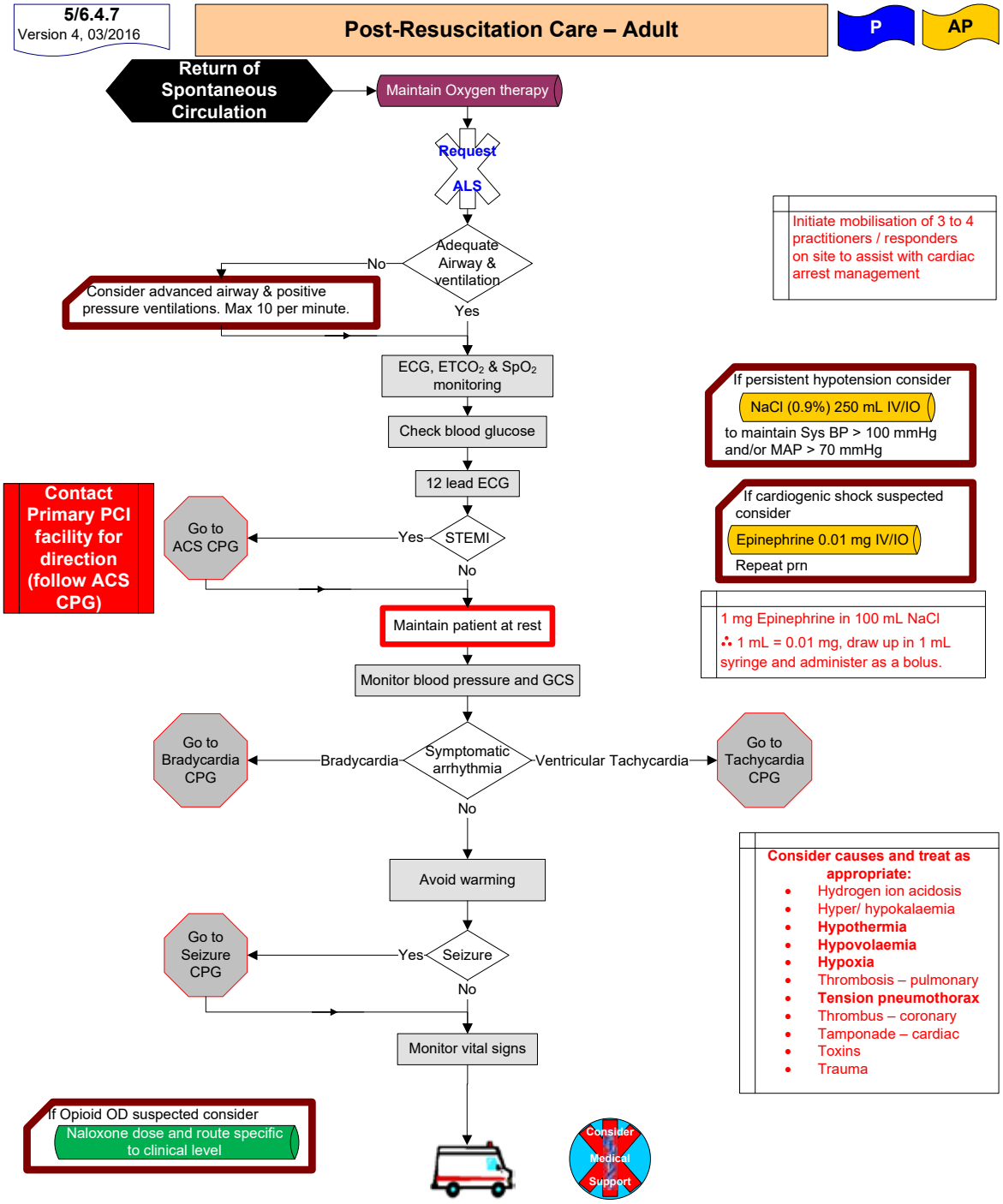
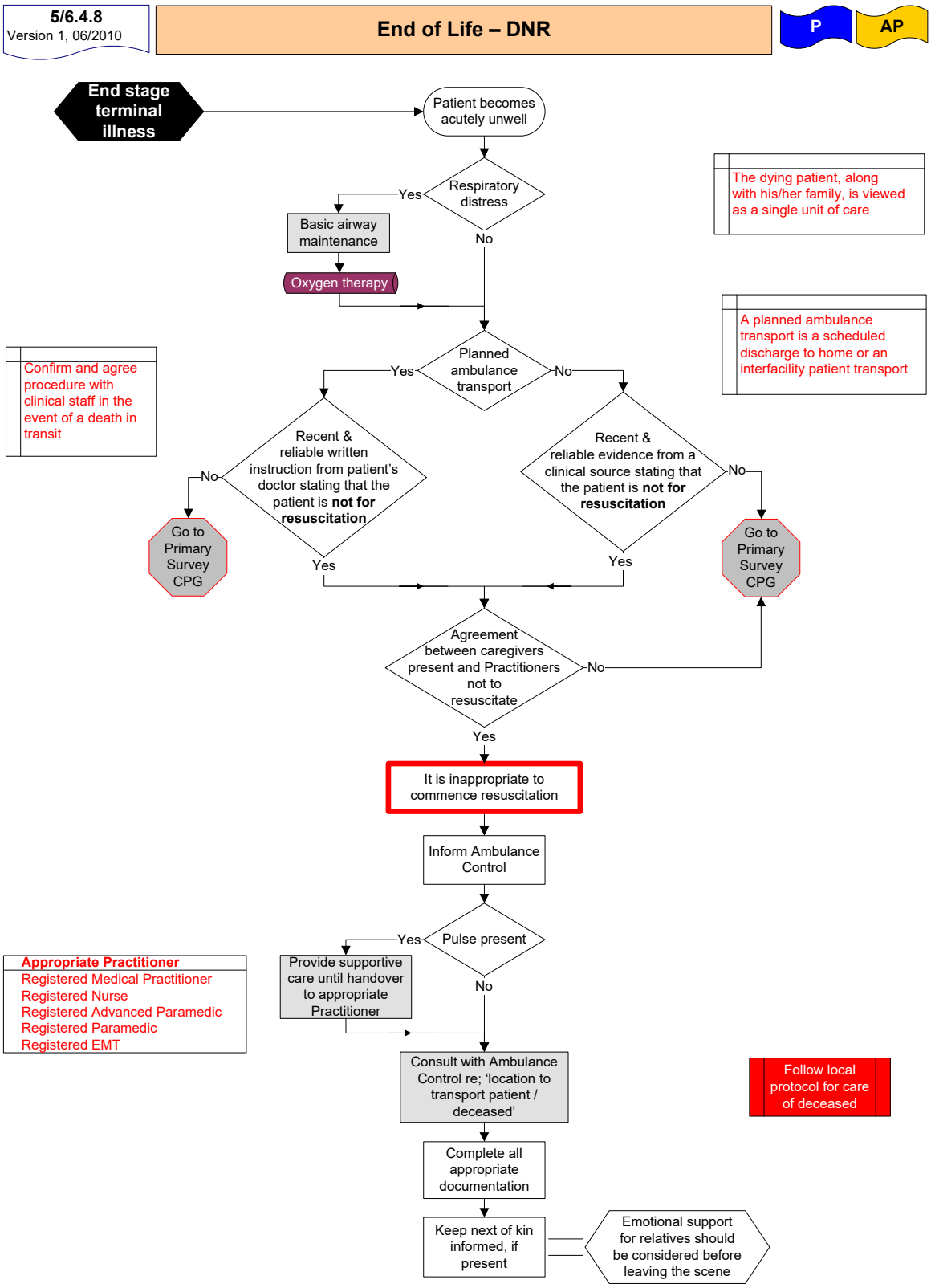
* +/- Pulse check: pulse check after 2 minutes of CPR if potentially perfusing rhythm

Reference: ILCOR Guidelines 2015



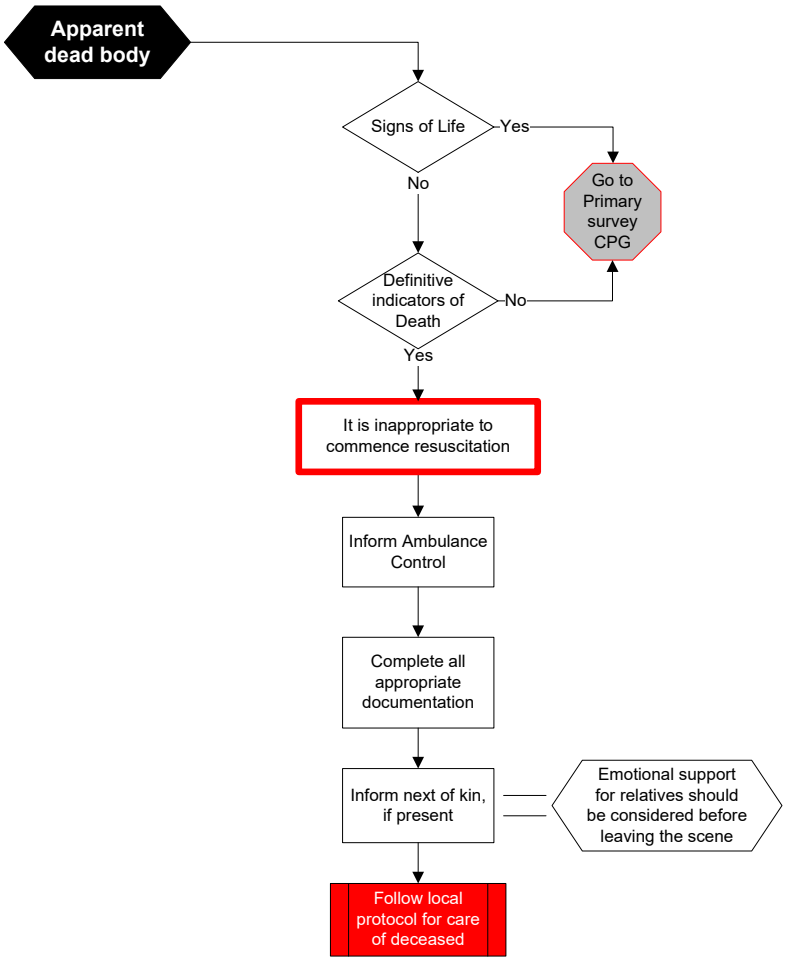
Reference: ILCOR Guidelines 2015
Noc, M., et al. (2014). "Invasive coronary treatment strategies for out-of-hospital cardiac arrest: a consensus statement from the European association for percutaneous cardiovascular interventions (EAPCI)/stent for life (SFL) groups." EuroIntervention **10**(1): 31-37


5/6.4.8
Version 1, 06/2010
End of Life – DNR
P
AP
End stage terminal illness
Patient becomes acutely unwell
Respiratory distress
Yes
No
Basic airway maintenance
Oxygen therapy
The dying patient, along with his/her family, is viewed as a single unit of care
Planned ambulance transport
Yes
No
A planned ambulance transport is a scheduled discharge to home or an interfacility patient transport
Confirm and agree procedure with clinical staff in the event of a death in transit
Recent & reliable written instruction from patient's doctor stating that the patient is not for resuscitation
No
Yes
Go to Primary Survey CPG
Recent & reliable evidence from a clinical source stating that the patient is not for resuscitation
No
Yes
Go to Primary Survey CPG
Agreement between caregivers present and Practitioners not to resuscitate
No
Yes
It is inappropriate to commence resuscitation
Inform Ambulance Control
Pulse present
Yes
No
Provide supportive care until handover to appropriate Practitioner
Appropriate Practitioner
Registered Medical Practitioner
Registered Nurse
Registered Advanced Paramedic
Registered Paramedic
Registered EMT
Consult with Ambulance Control re; 'location to transport patient / deceased'
Follow local protocol for care of deceased
Complete all appropriate documentation
Keep next of kin informed, if present
Emotional support for relatives should be considered before leaving the scene

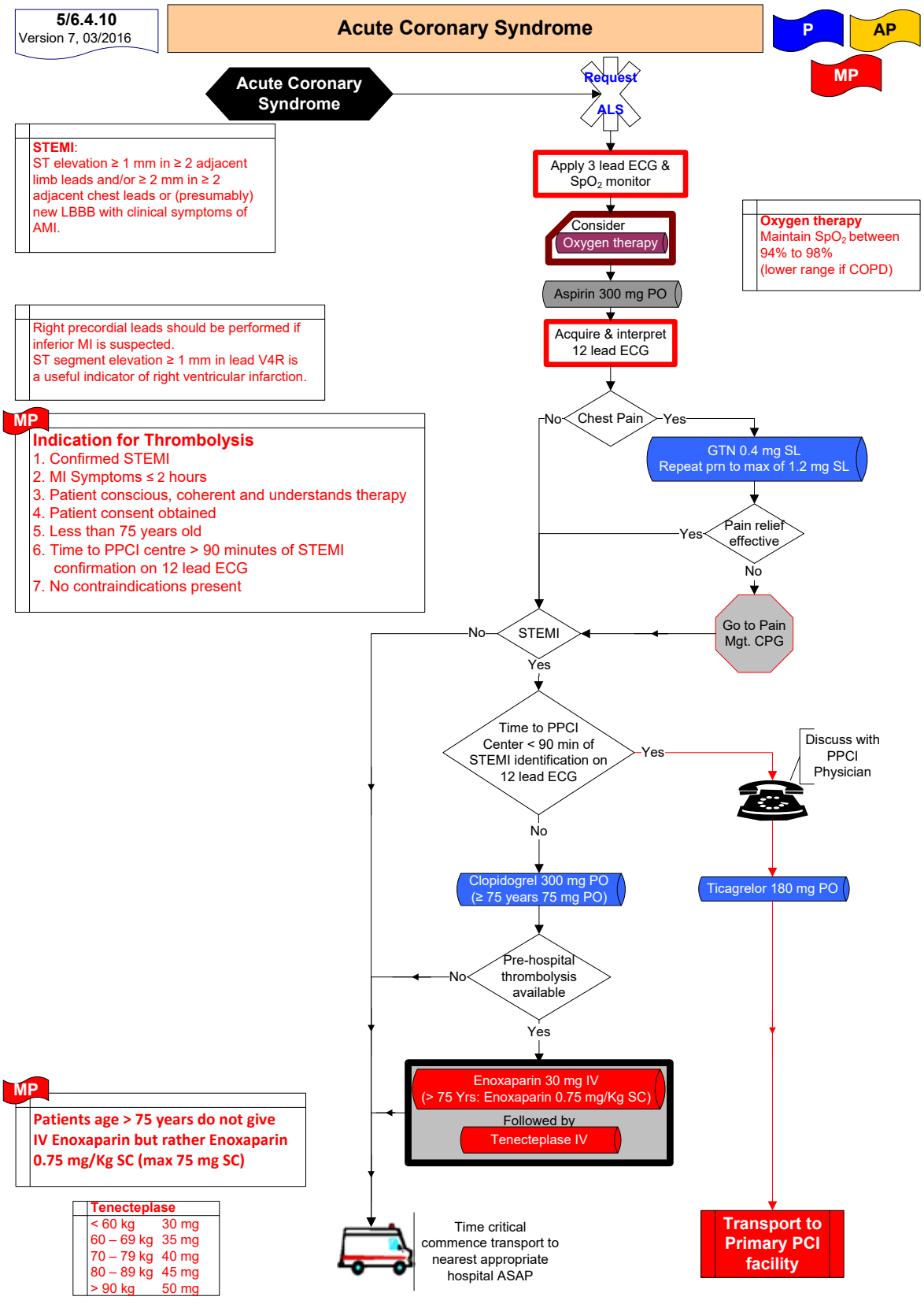
5/6.4.9
Version 2, 06/2011

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)

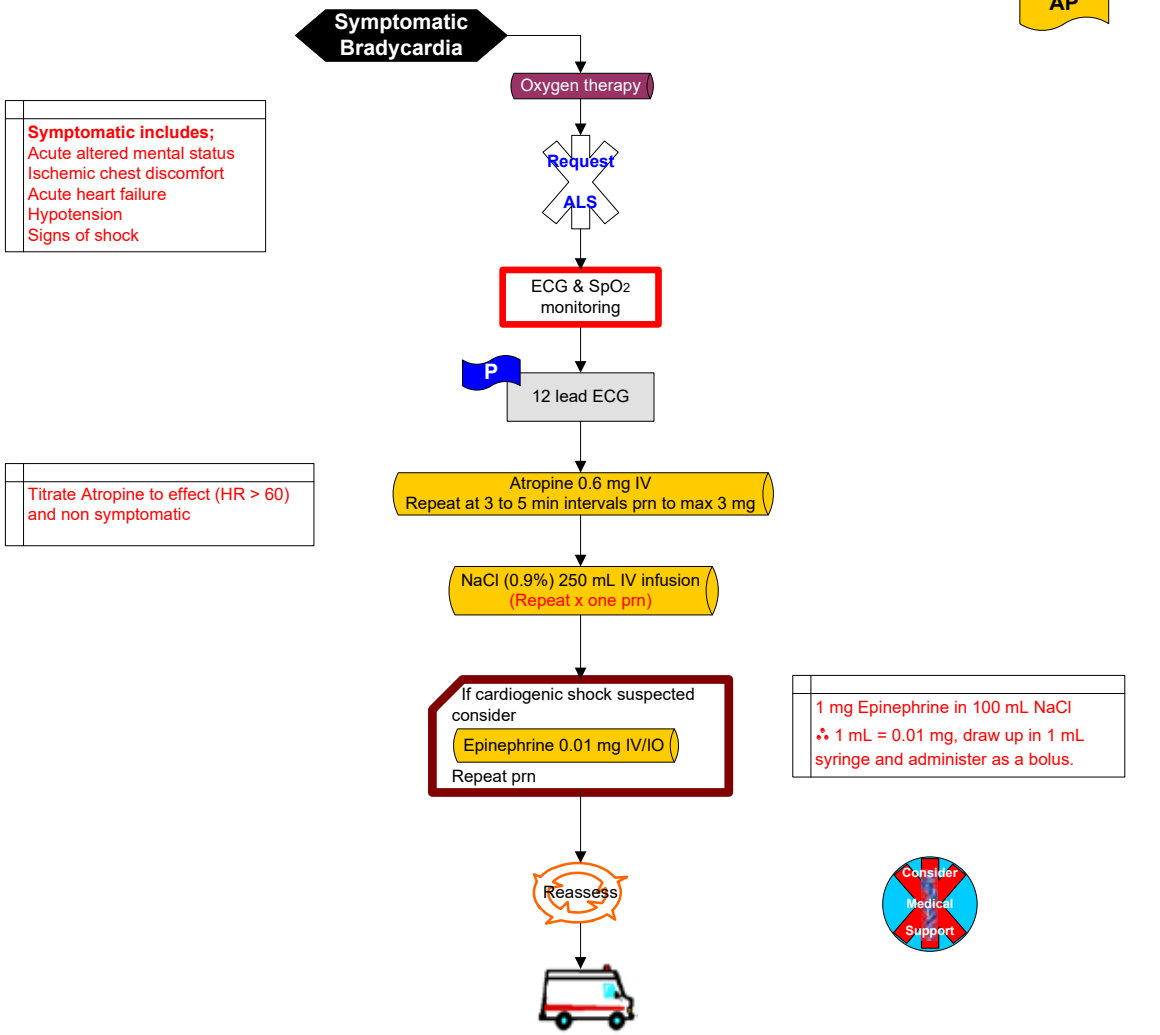


Reference: HSE ACS Programme 2013, ILCOR Guidelines 2015, ECS Guidelines 2010

4/5/6.4.11
Version 3, 03/2016

Symptomatic Bradycardia – Adult

EMT P AP

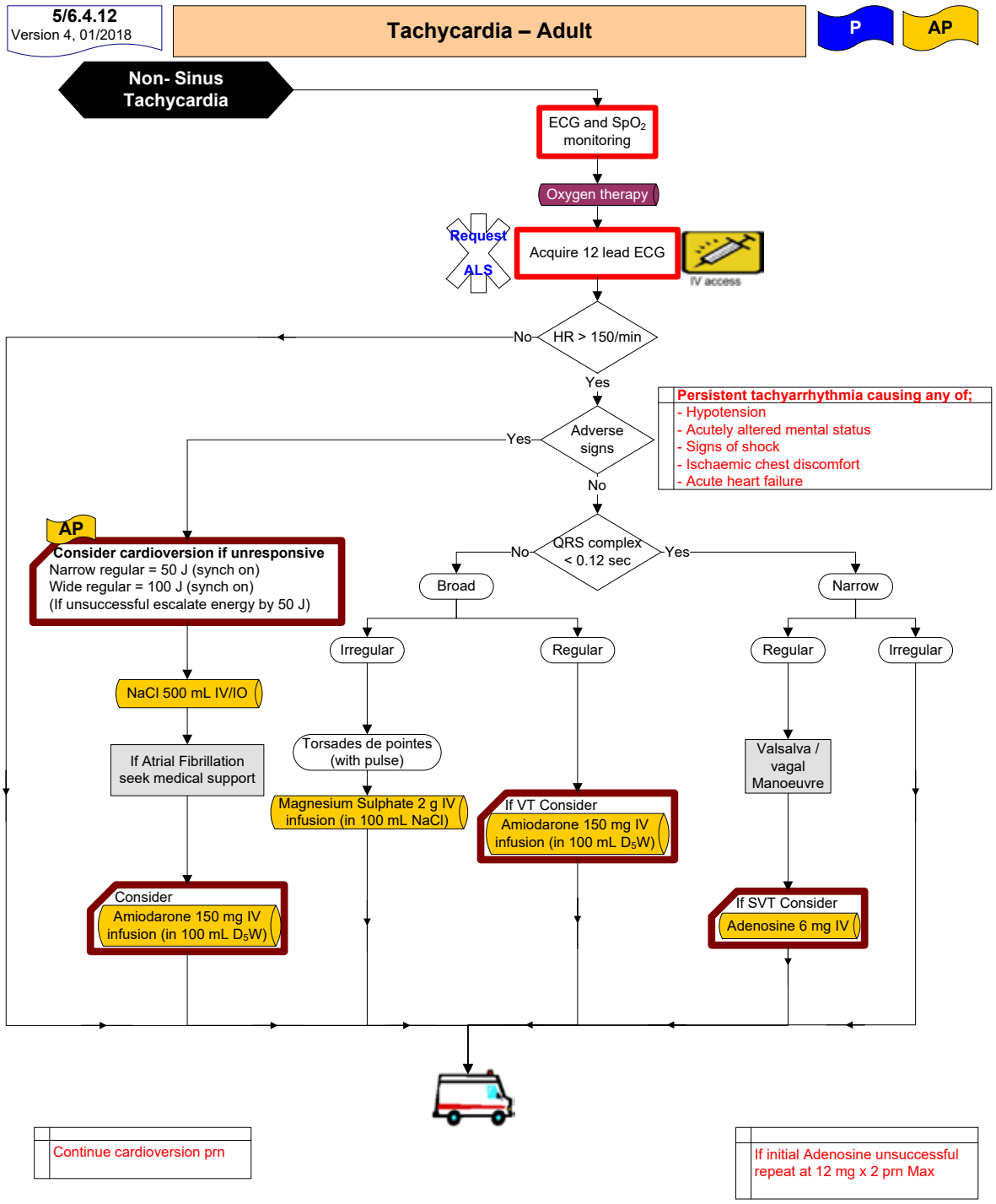


Symptomatic includes;
Acute altered mental status
Ischemic chest discomfort
Acute heart failure
Hypotension
Signs of shock

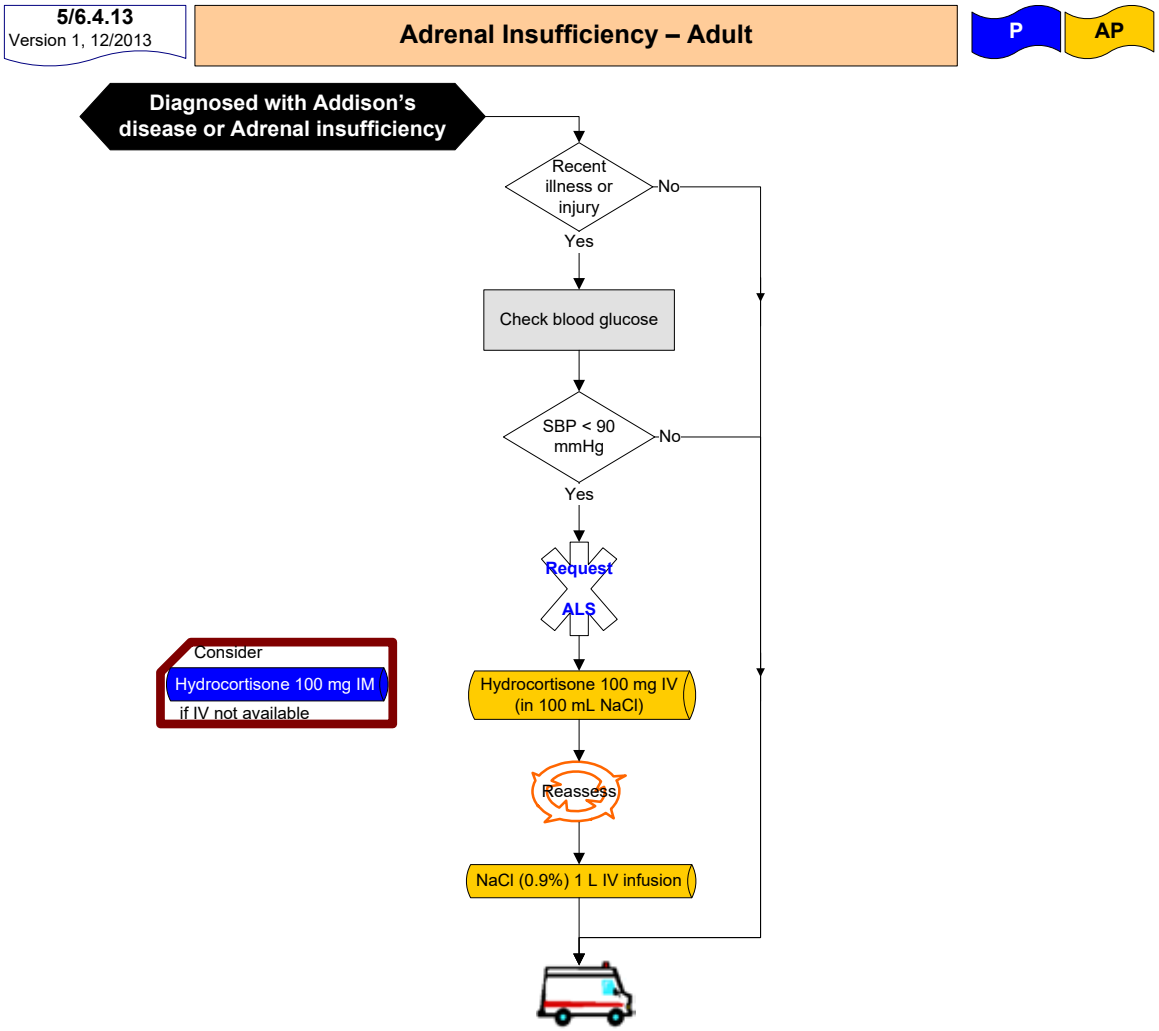
Titrate Atropine to effect (HR > 60) and non symptomatic

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

Reference: ILCOR guidelines 2015



Reference: ILCOR Guidelines 2015

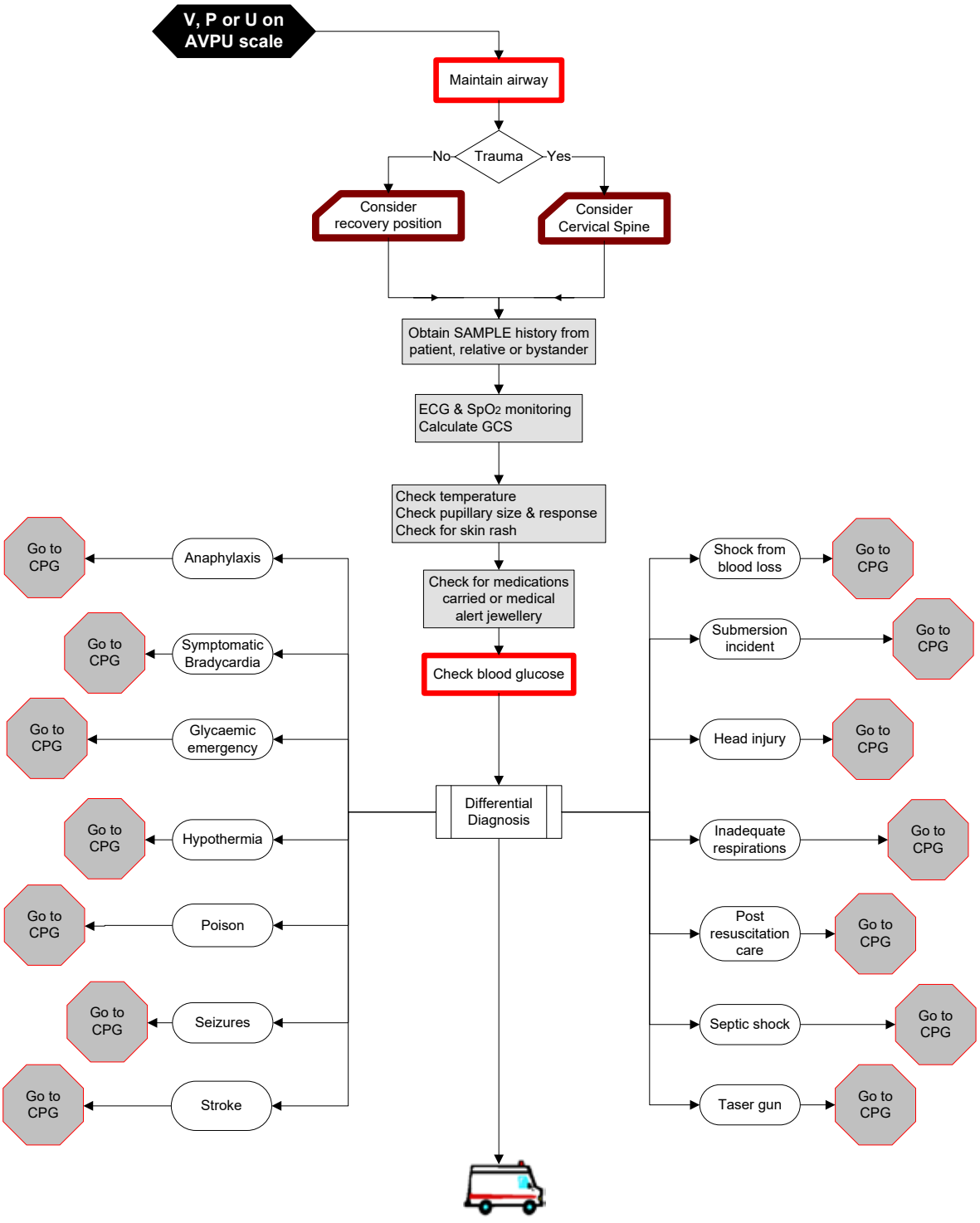


Reference: Wiebke Arlt, Emergency management of acute adrenal insufficiency (adrenal crisis) in adult patients, Endocrine Connections 2016, Sep; 5 (5): G1 – G3

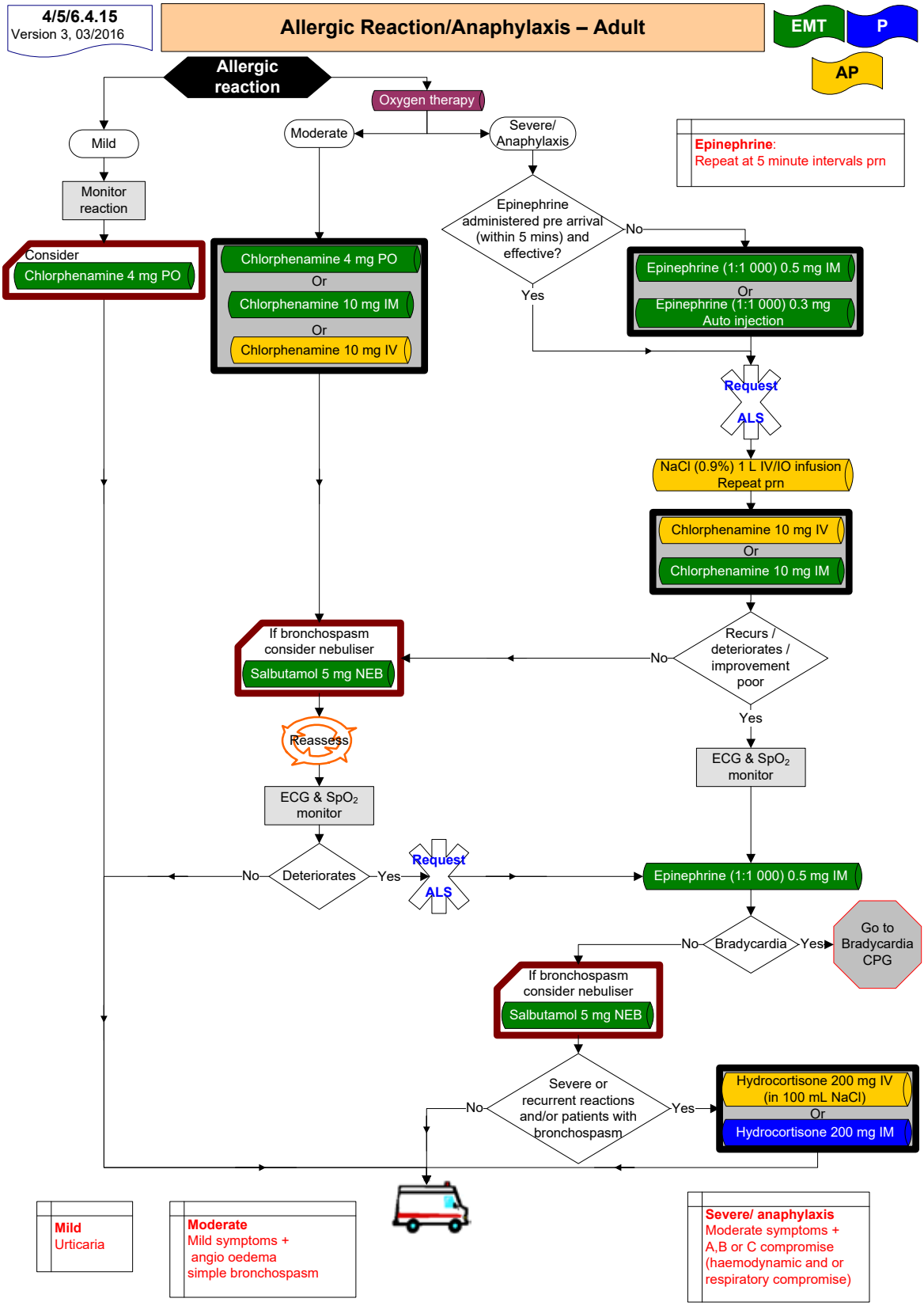
5/6.4.14
Version 1, 05/2008

Altered Level of Consciousness – Adult

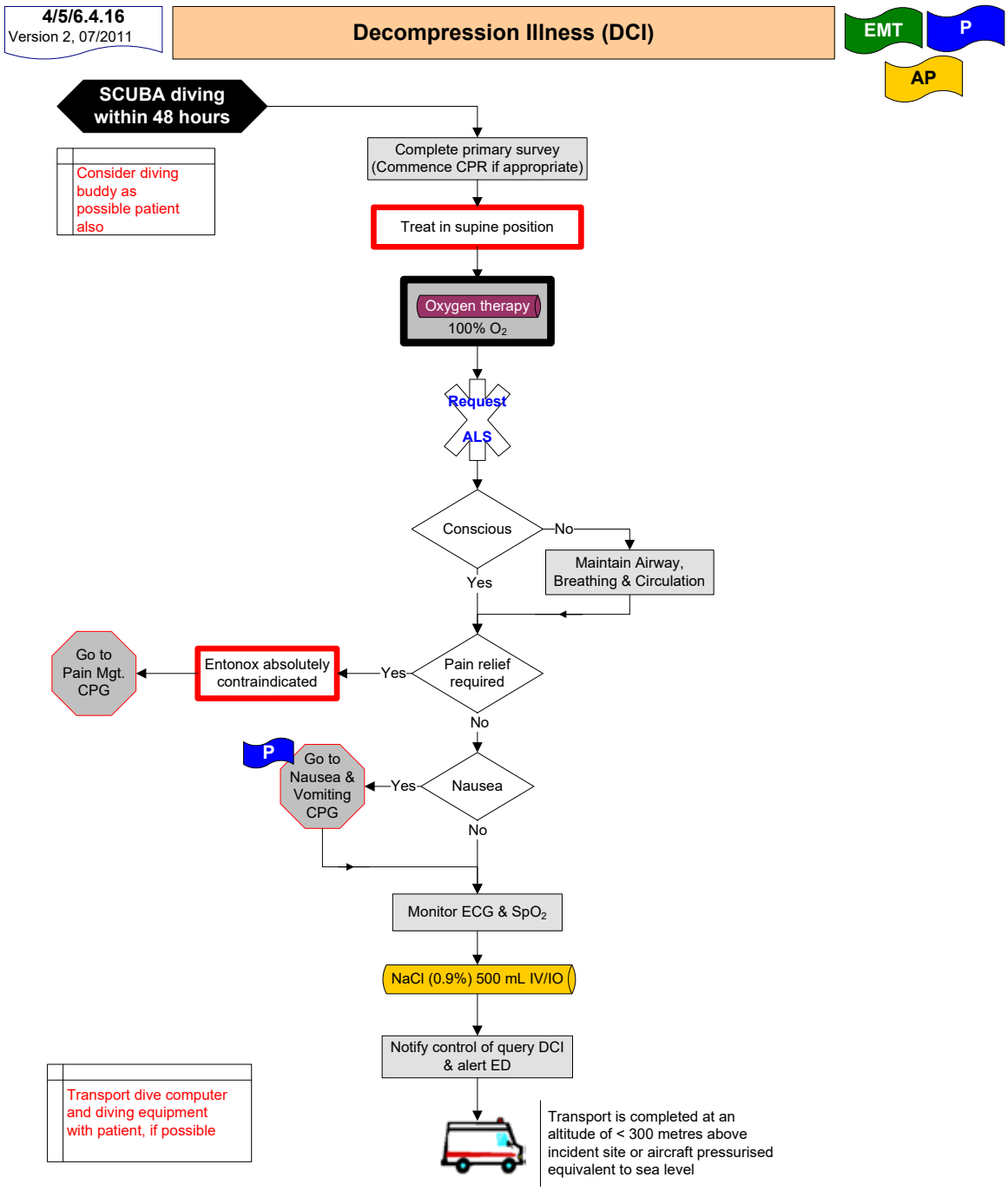
P AP



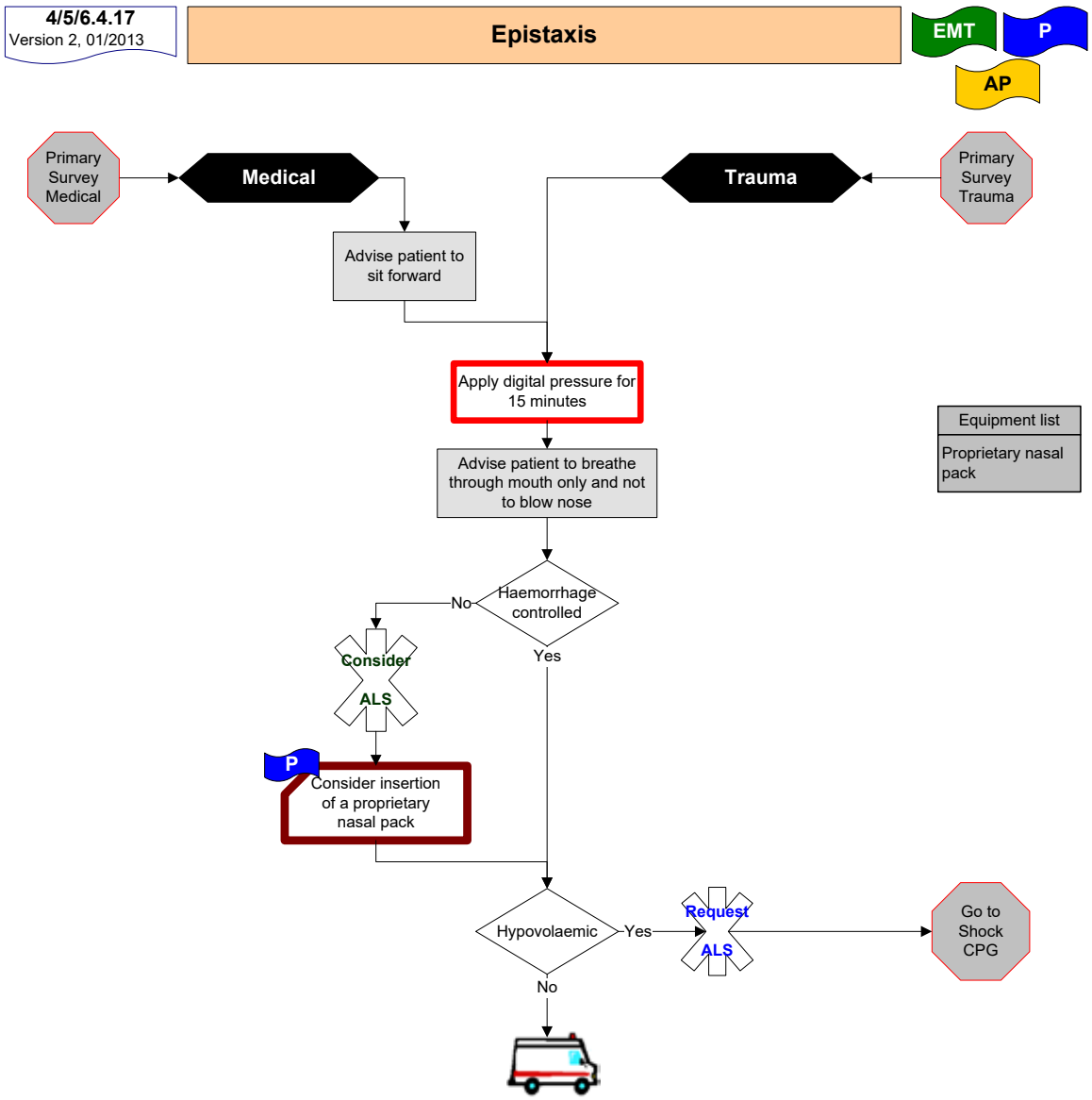
Pre-Hospital Emergency Care Council



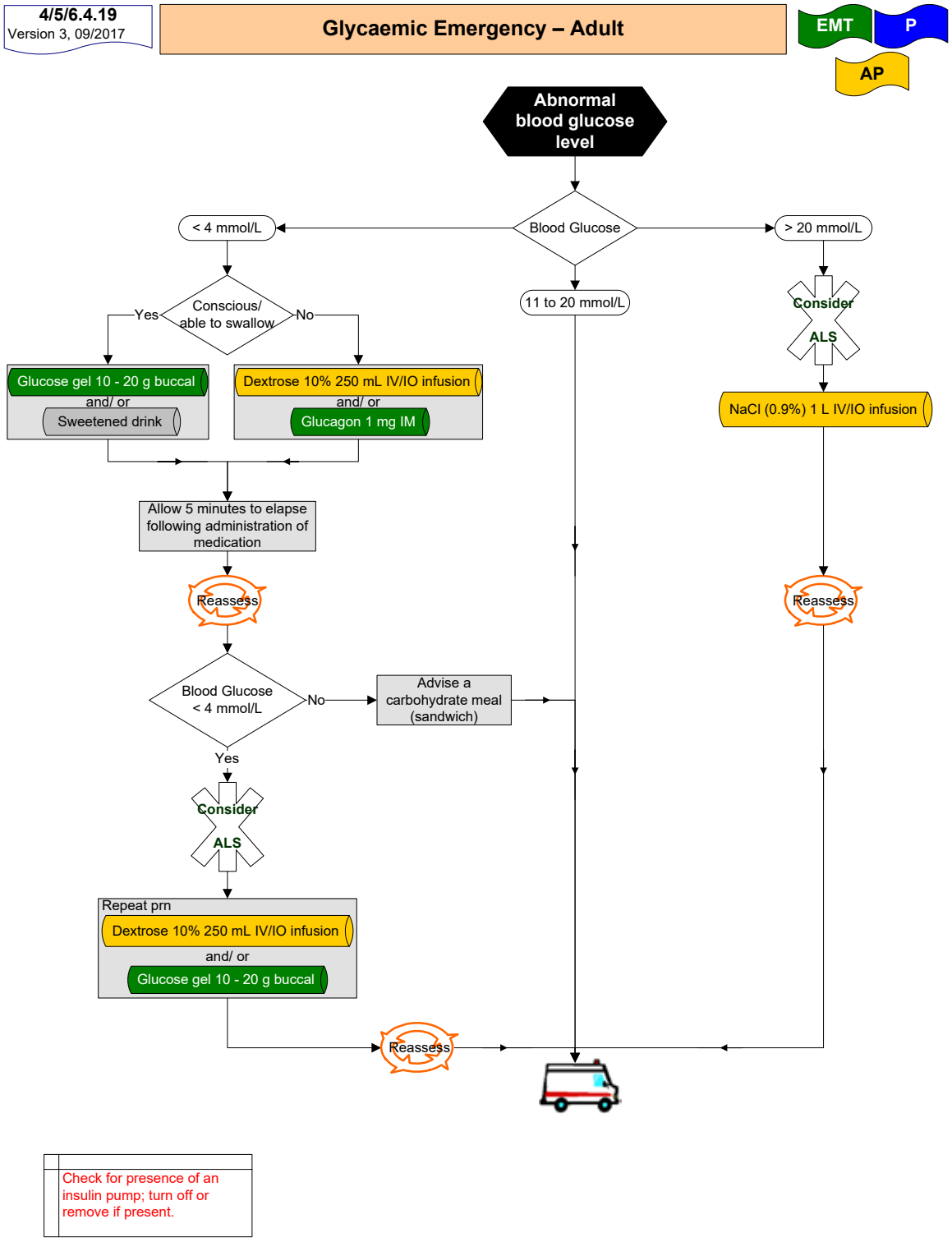
Reference: Royal College of Physicians of Ireland, 2014, National Immunisation Advisory Committee, Anaphylactic Reactions: Treatment Algorithm for First Medical Responders.



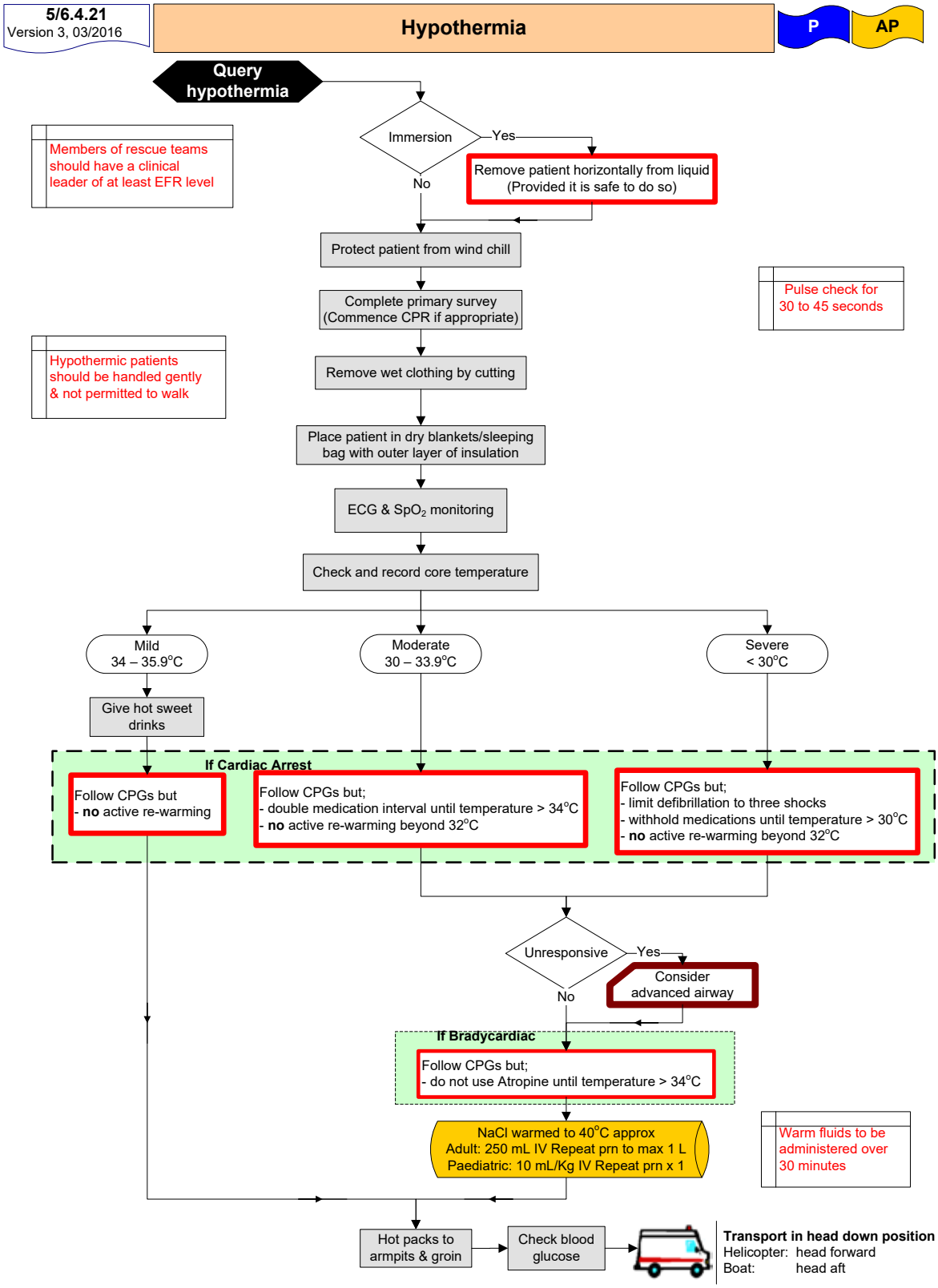
Reference: The Primary Clinical Care Manual 3rd Edition, 2003, Queensland Health and the Royal Flying Doctor Service (Queensland Section)



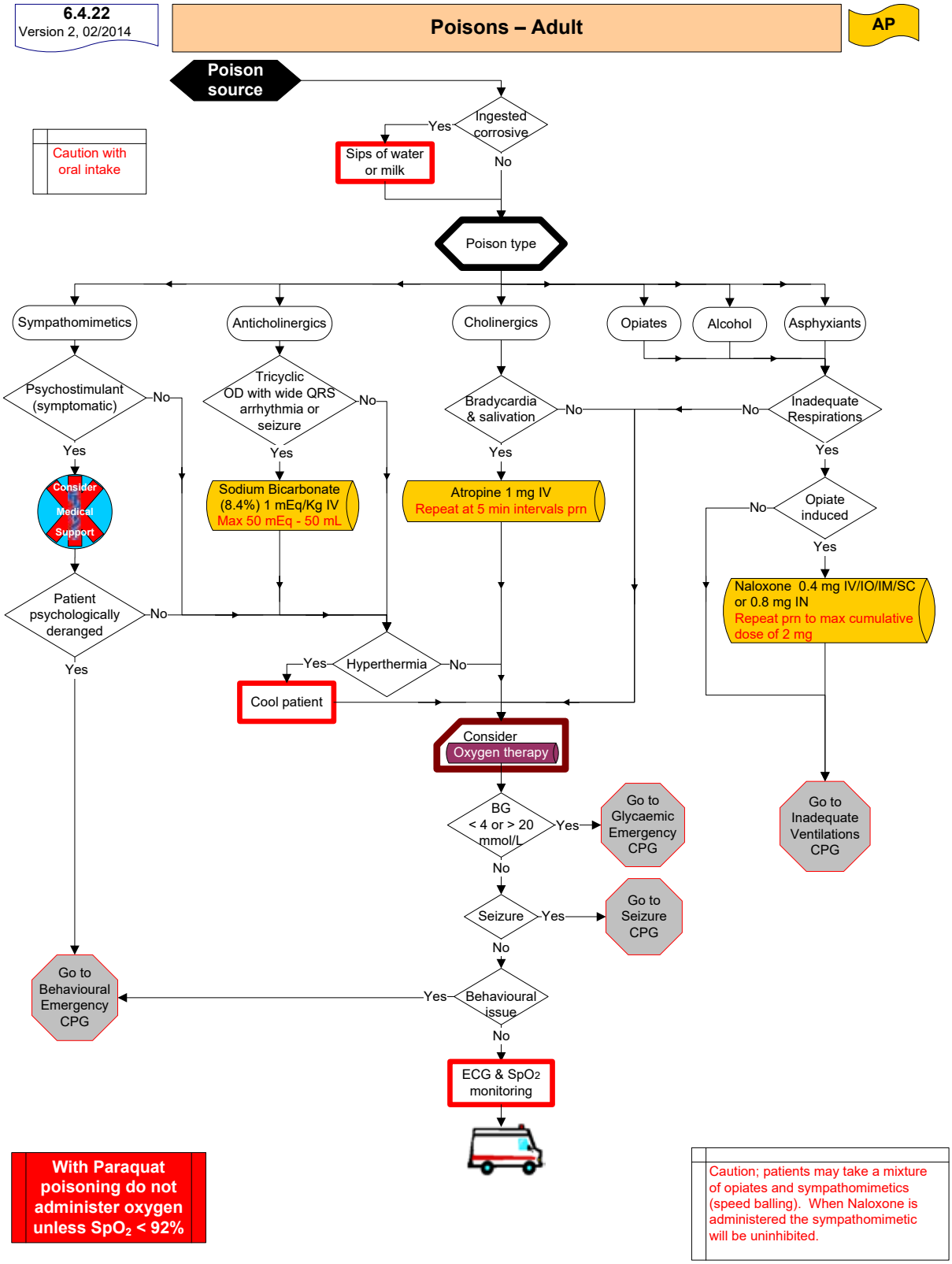
Reference: Management of Acute Epistaxis 2011, Ola Bamimore, MD; Chief Editor: Steven C Dronen, MD, http://emedicine.medscape.com/article/764719-overview#showall



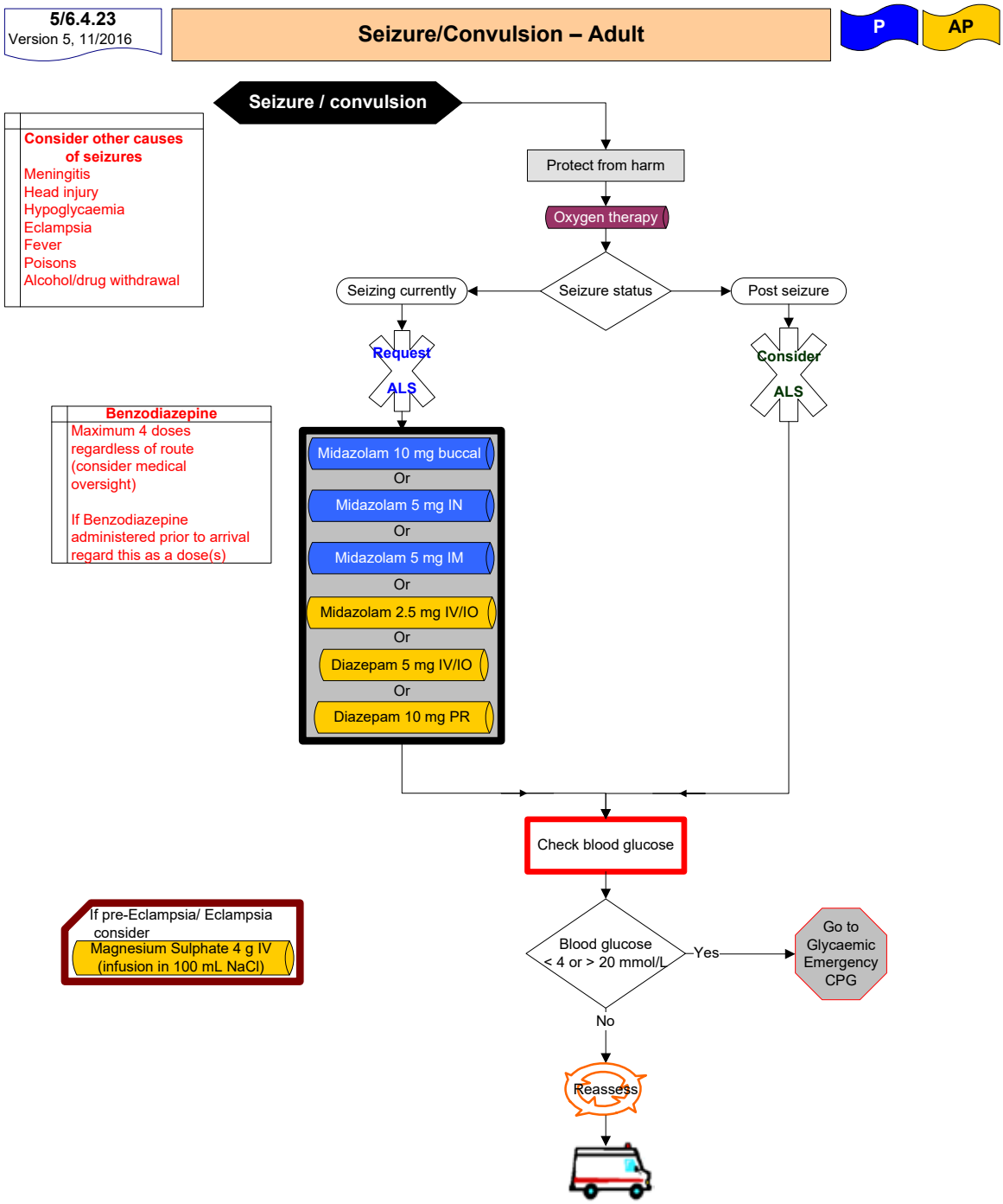
Reference:
Moore, C. and M. Woollard (2005). "Dextrose 10% or 50% in the treatment of hypoglycaemia out of hospital? A randomised controlled trial." Emerg Med J **22**(7): 512-515
Carstens, S. and M. Sprehn (1998). "Prehospital treatment of severe hypoglycaemia: a comparison of intramuscular glucagon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



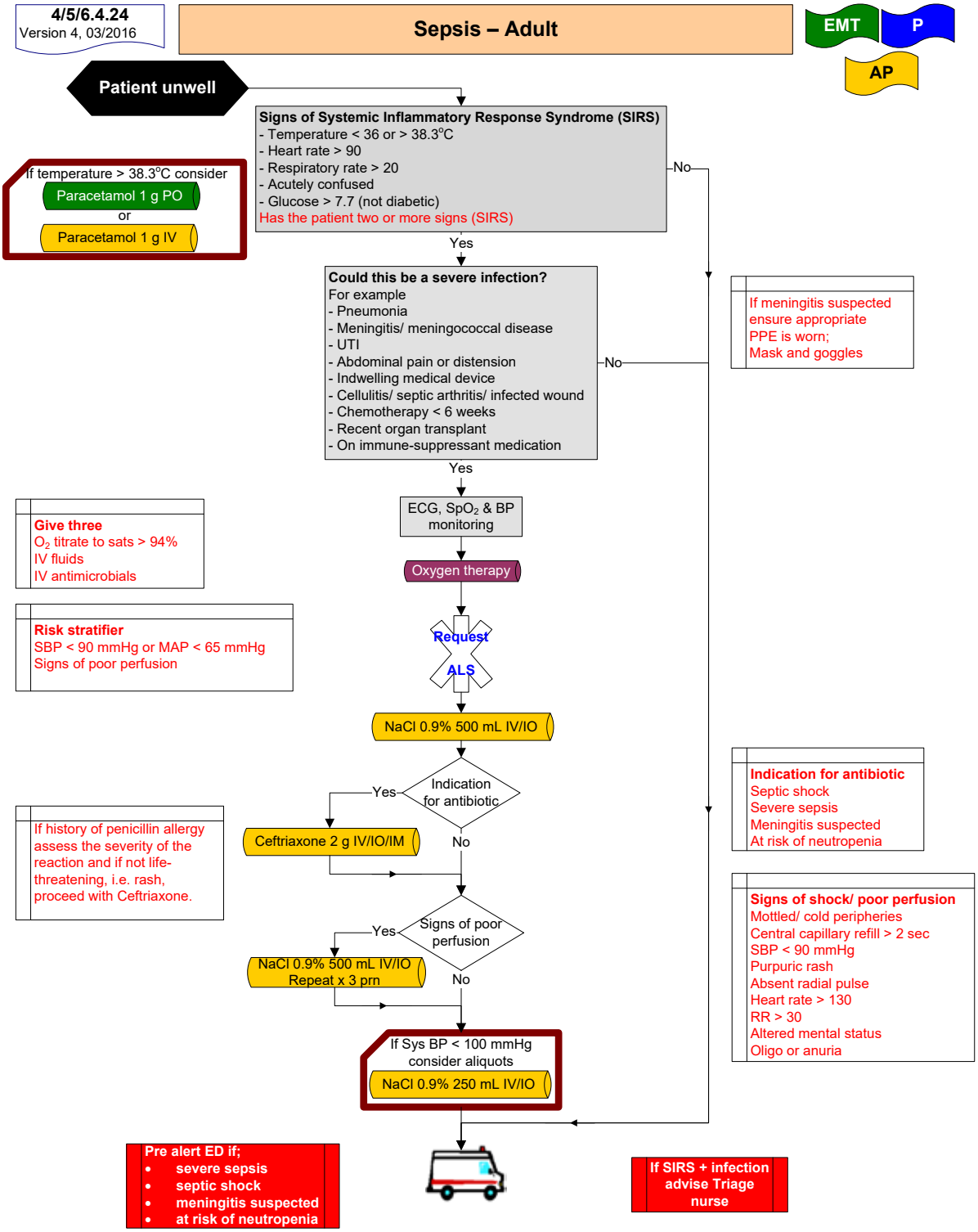
Reference: Golden, F & Tipton M, 2002, Essentials of Sea Survival, Human Kinetics
European Resuscitation Council Guidelines for Resuscitation 2015
Pennington M, et al, 1994, Wilderness EMT, Wilderness EMS Institute



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/NEJMra1202561
National Drugs Strategy, 2006, Management of Patients with Psychostimulant Toxicity, Guidelines for ambulance service, Commonwealth of Australia.



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

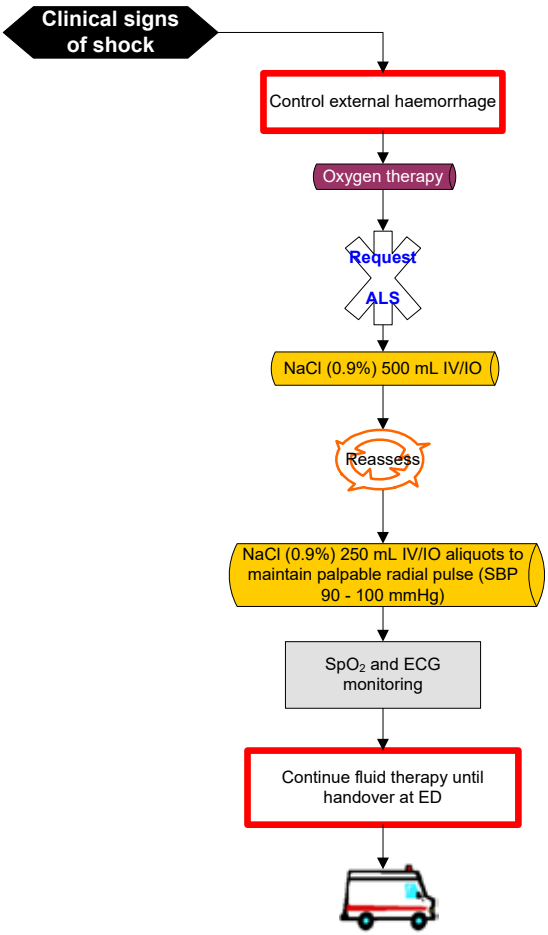


Reference: National Clinical Guideline No. 6: Sepsis Management, National Clinical Effectiveness Committee, Department of Health, November, 2014

5/6.4.25
Version 1, 12/2013

Shock from Blood Loss (non-trauma) – Adult

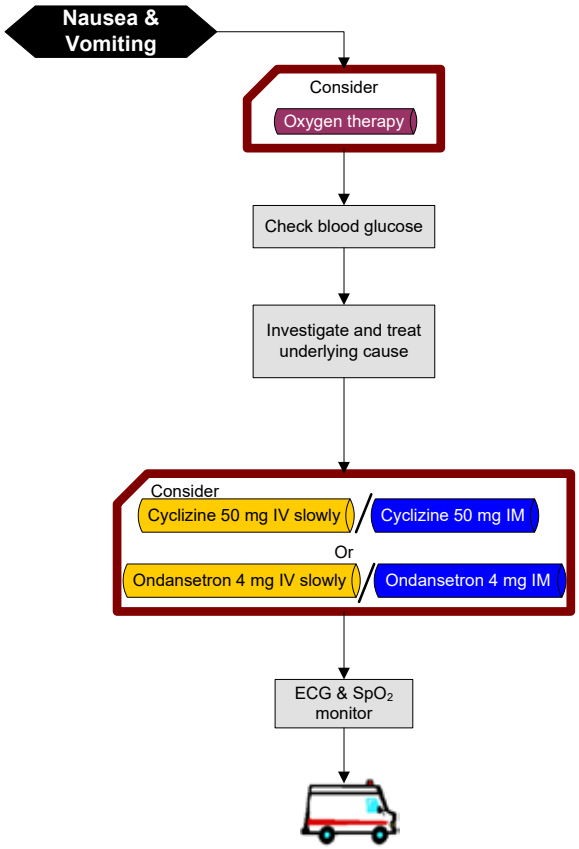
P AP



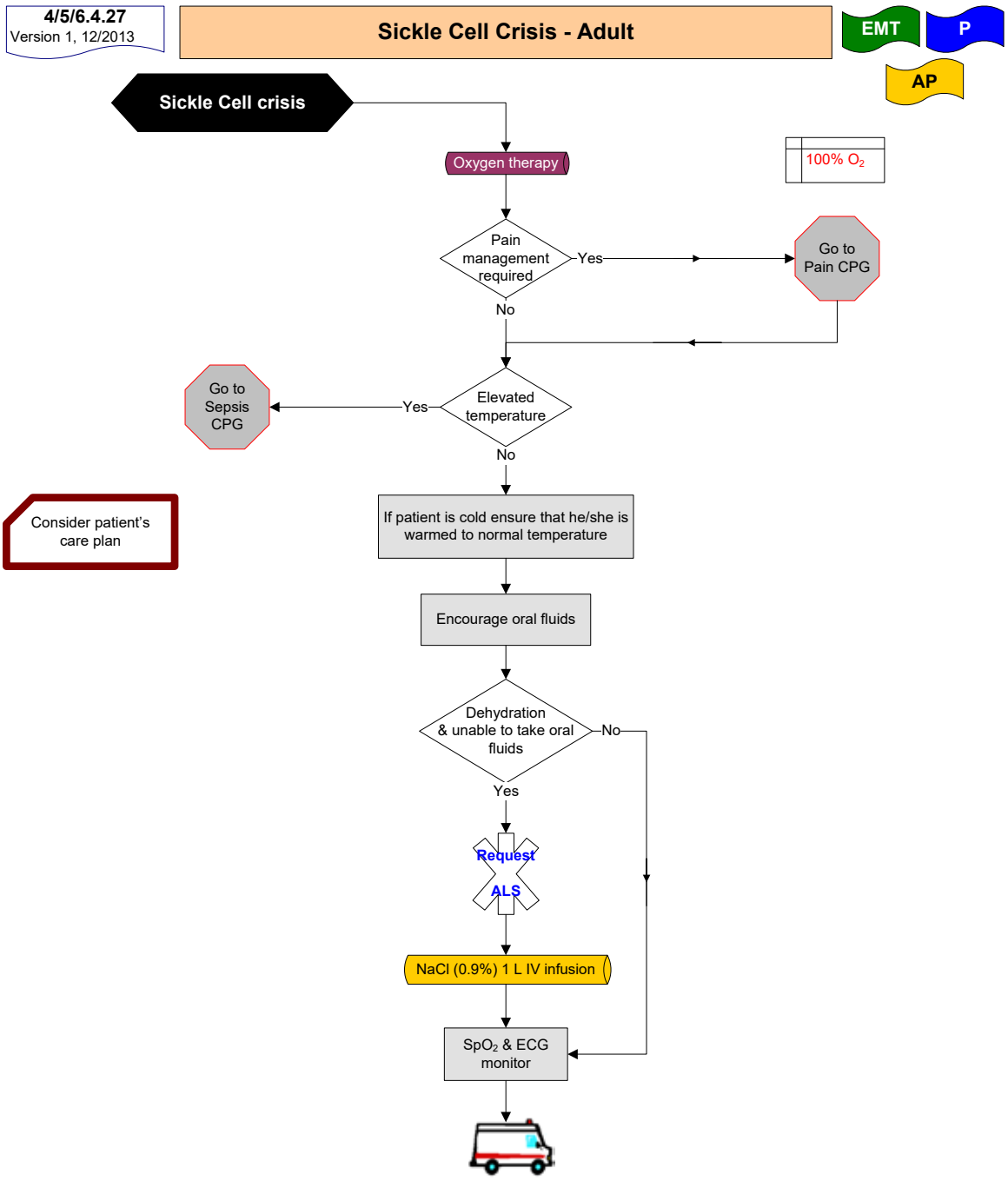
5/6.4.26
Version 2, 04/2016

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

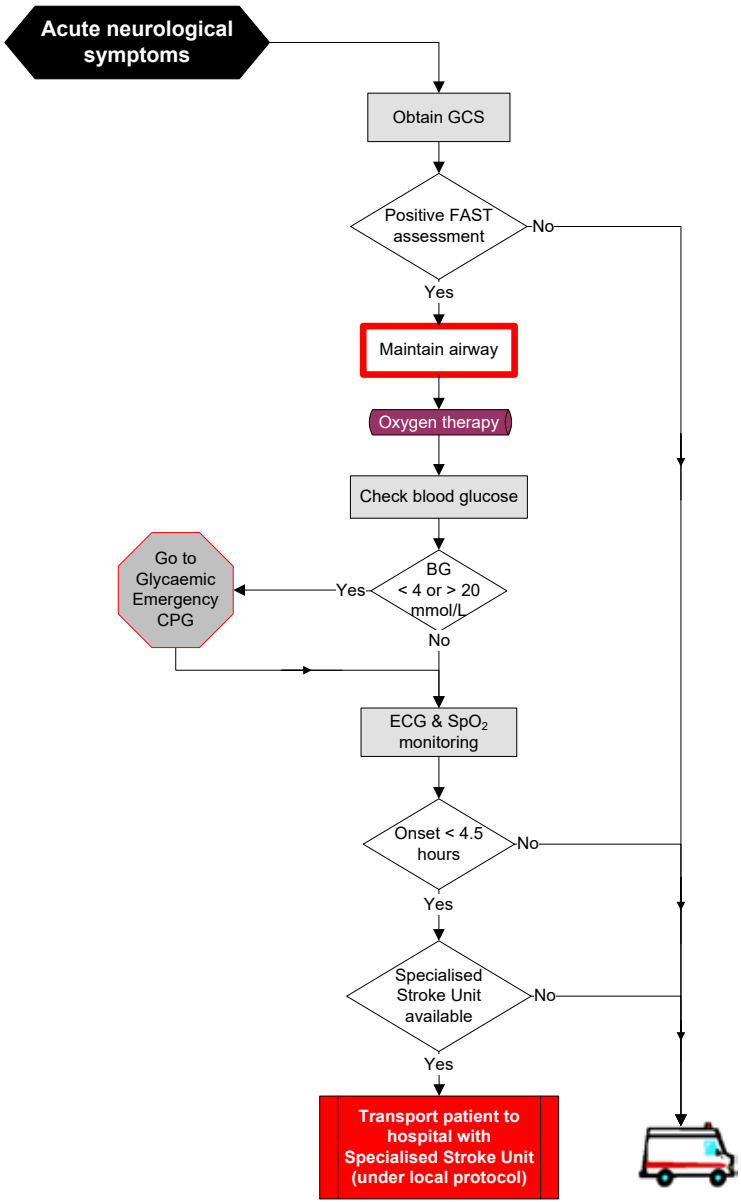


Reference: Rees, D, 2003, GUIDELINES FOR THE MANAGEMENT OF THE ACUTE PAINFUL CRISIS IN SICKLE CELL DISEASE; British Journal of Haematology, 2003, 120, 744–752

5/6.4.28
Version 3, 03/2016

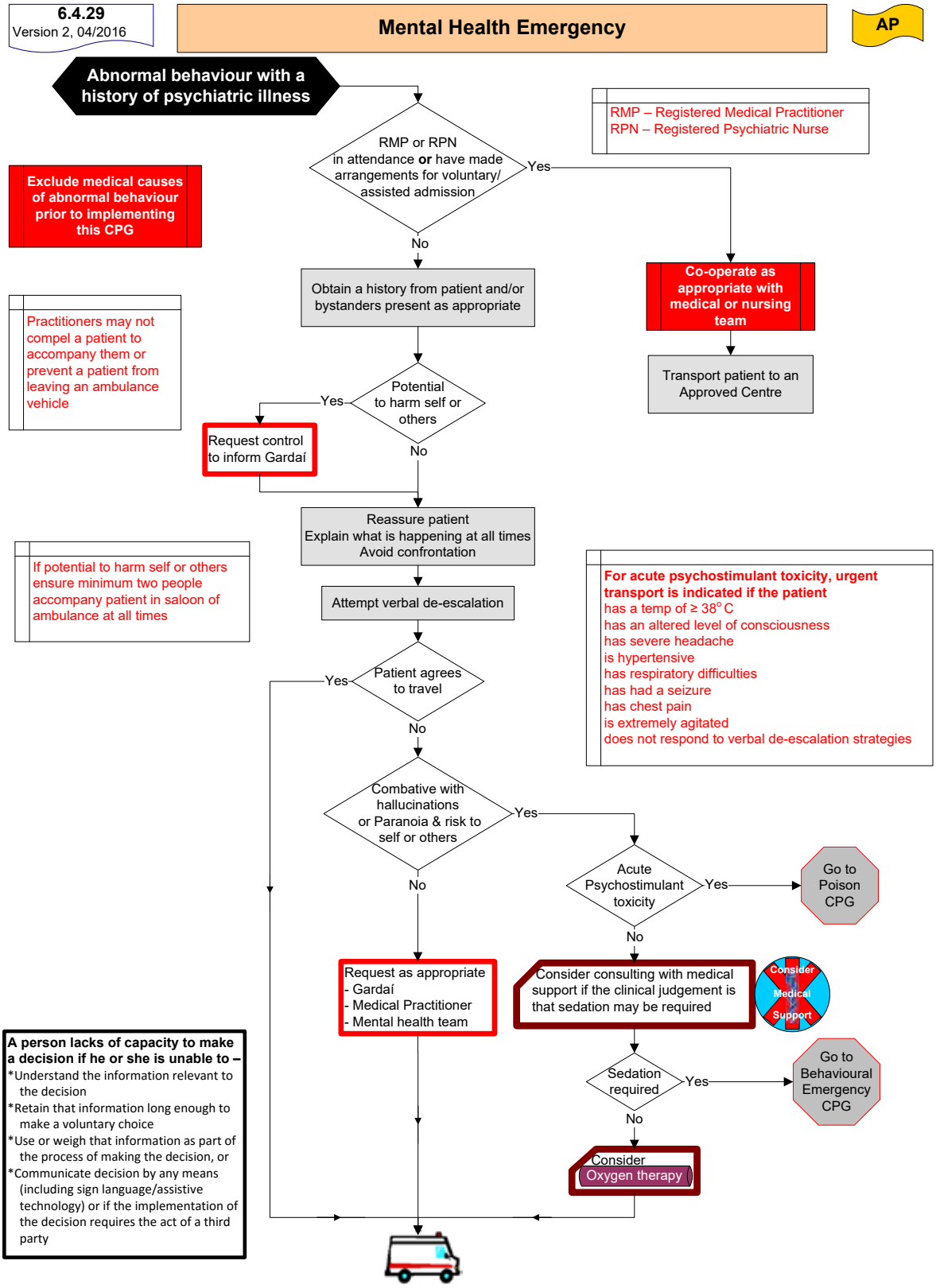
Stroke

P AP

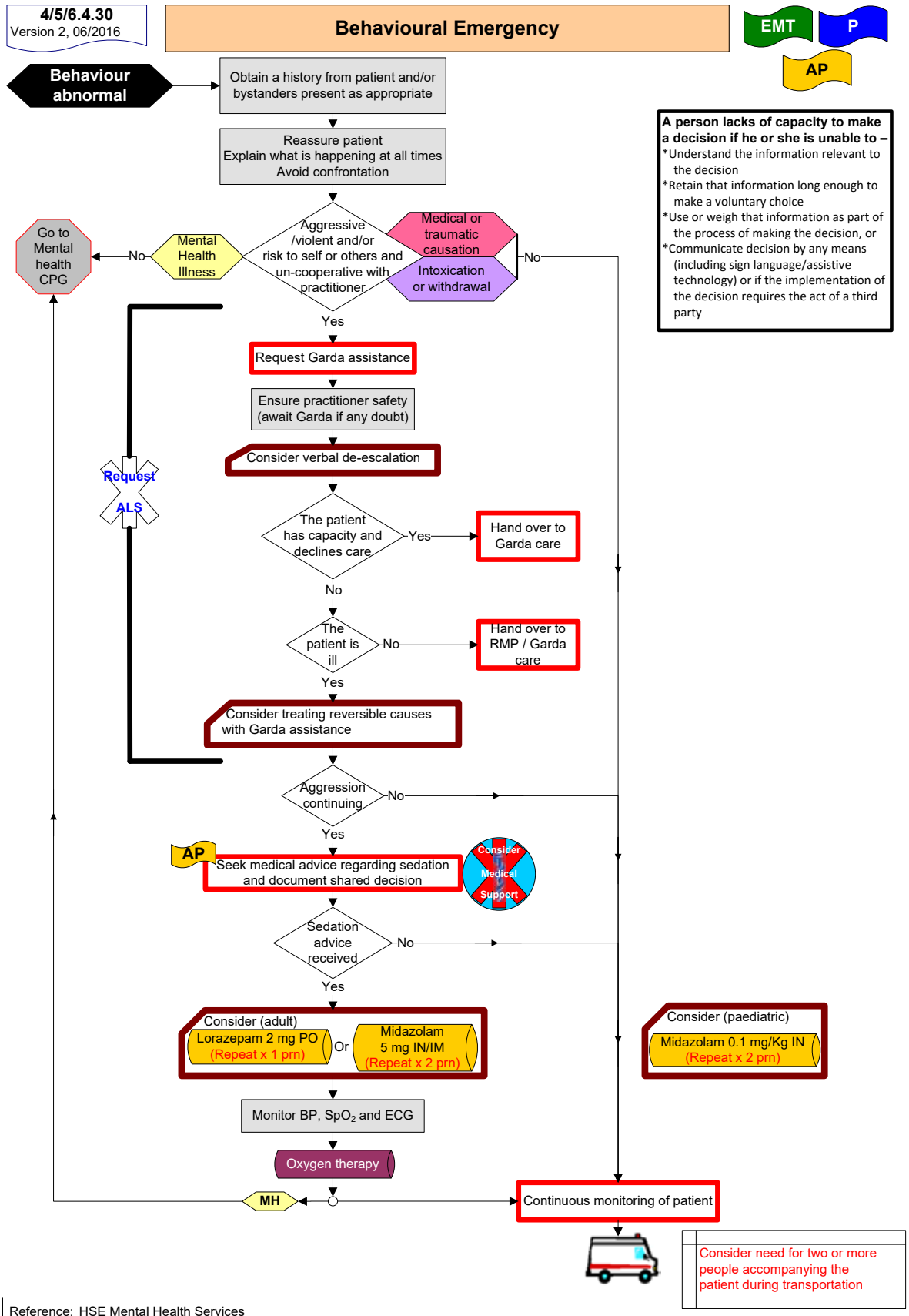


F – facial weakness Can the patient smile? Has their mouth or eye drooped? Which side? **A – arm weakness** Can the patient raise both arms and maintain for 5 seconds? **S – speech problems** Can the patient speak clearly and understand what you say? **T – time of onset**

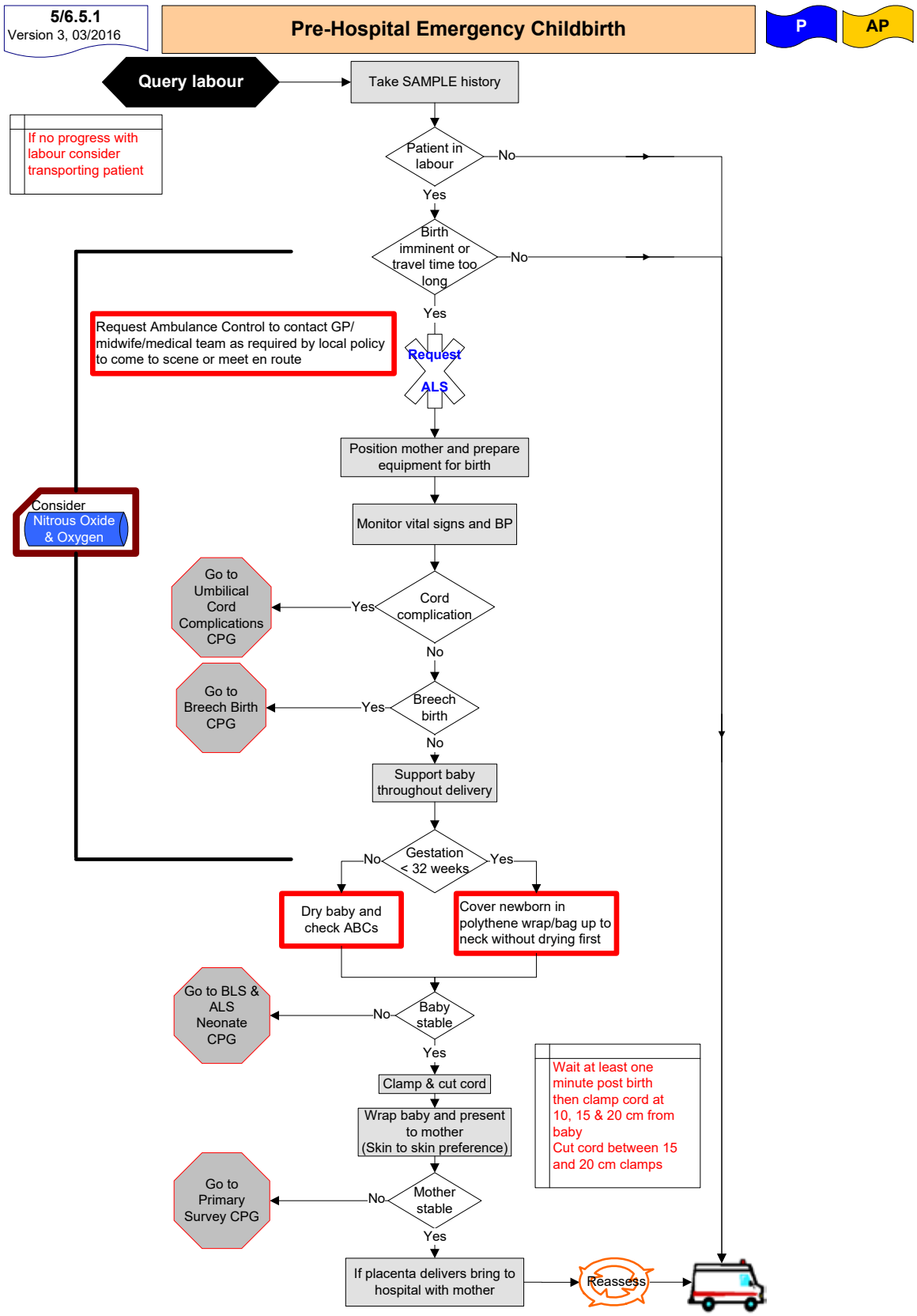
Reference
ILCOR Guidelines 2015
Prof R Boyle, 2006, Mending hearts and brains, Clinical case for change: Report by Prof R Boyle, National Director for Heart Disease and Stroke, NHS
AHA, 2005, Part 9 Adult Stroke, Circulation 2005; 112; 111-120
A. Mohd Nor, et al, Agreement between ambulance paramedic- 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



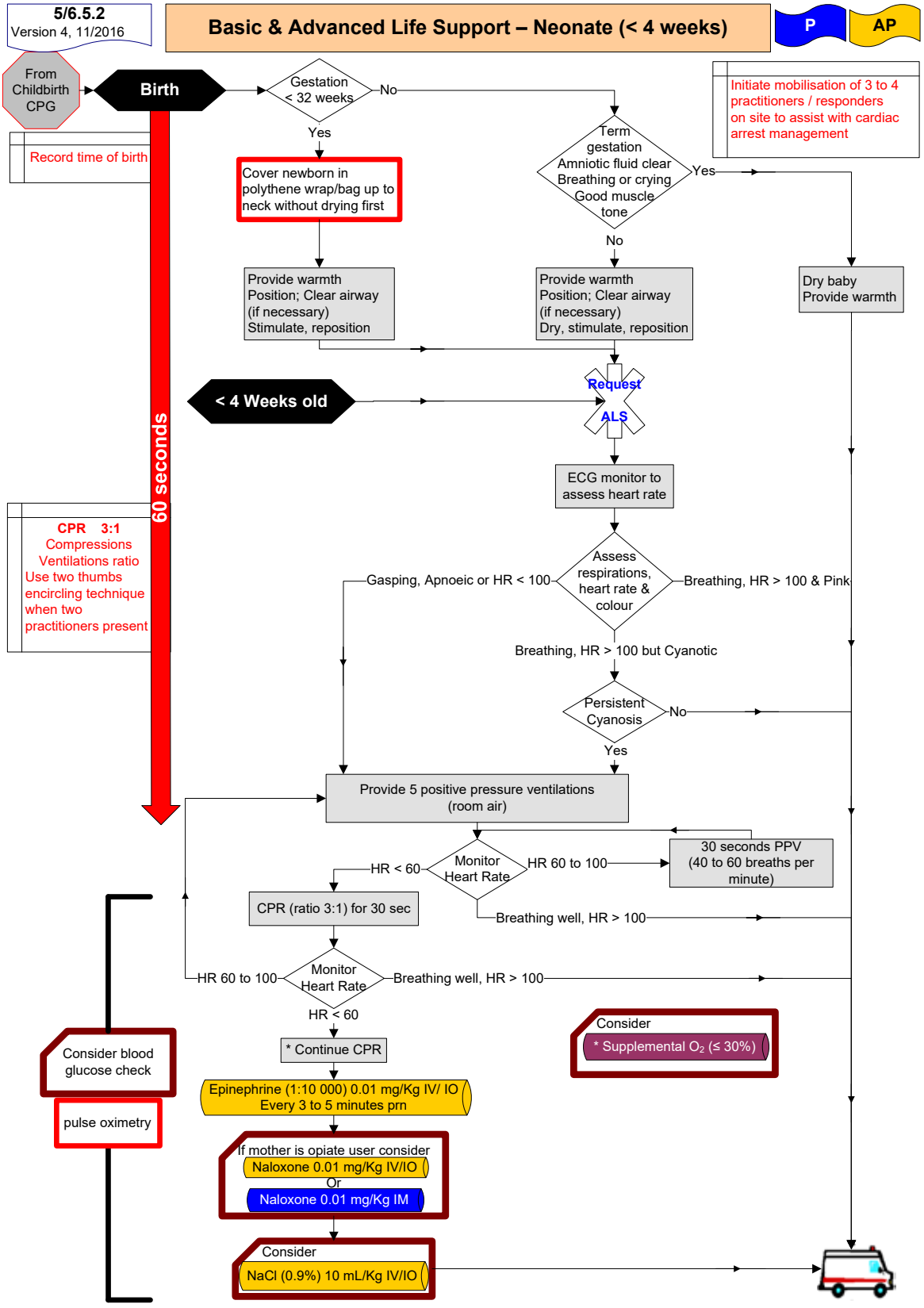
References: Management for patients with psychostimulant toxicity, Guidelines for Ambulance Services, 2006, National Drugs Strategy, Commonwealth of Australia.
Reference Guide to the Mental Health Act 2001, Mental Health Commission
HSE Mental Health Services



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



Reference: ILCOR Guidelines 2015

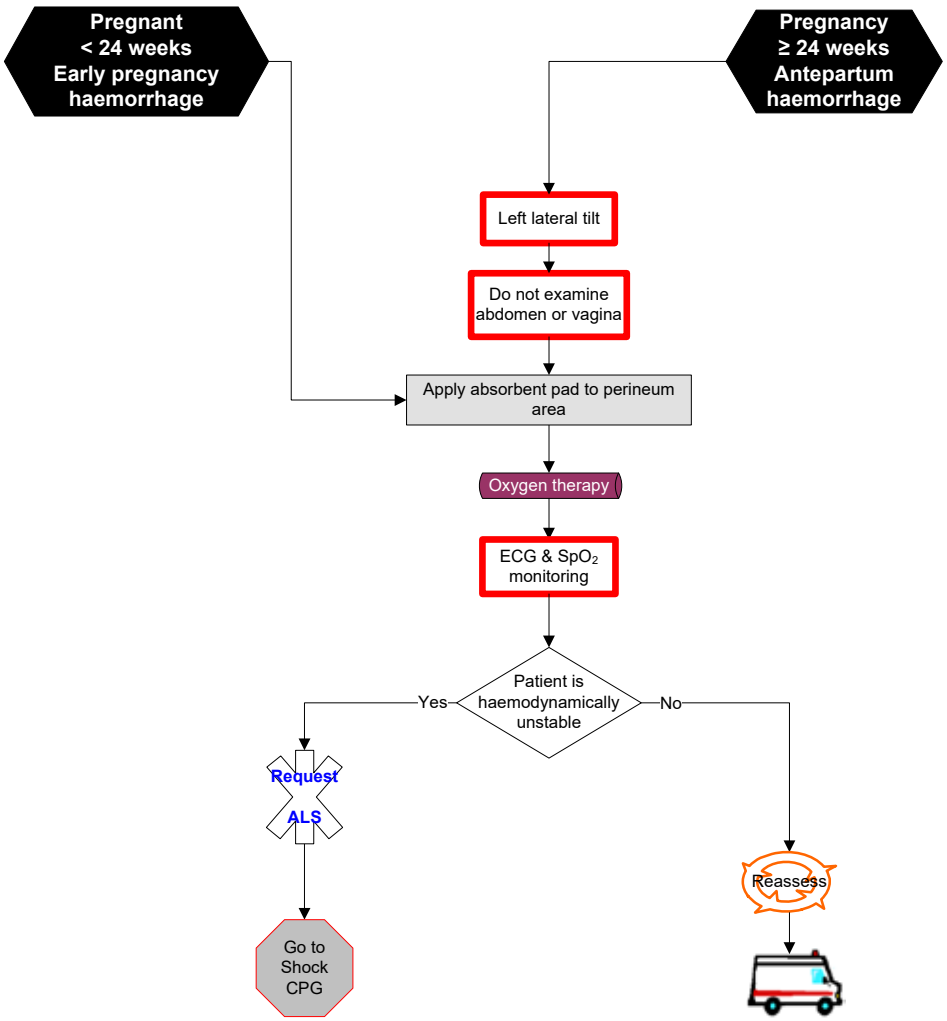


Reference: ILCOR Guidelines 2015

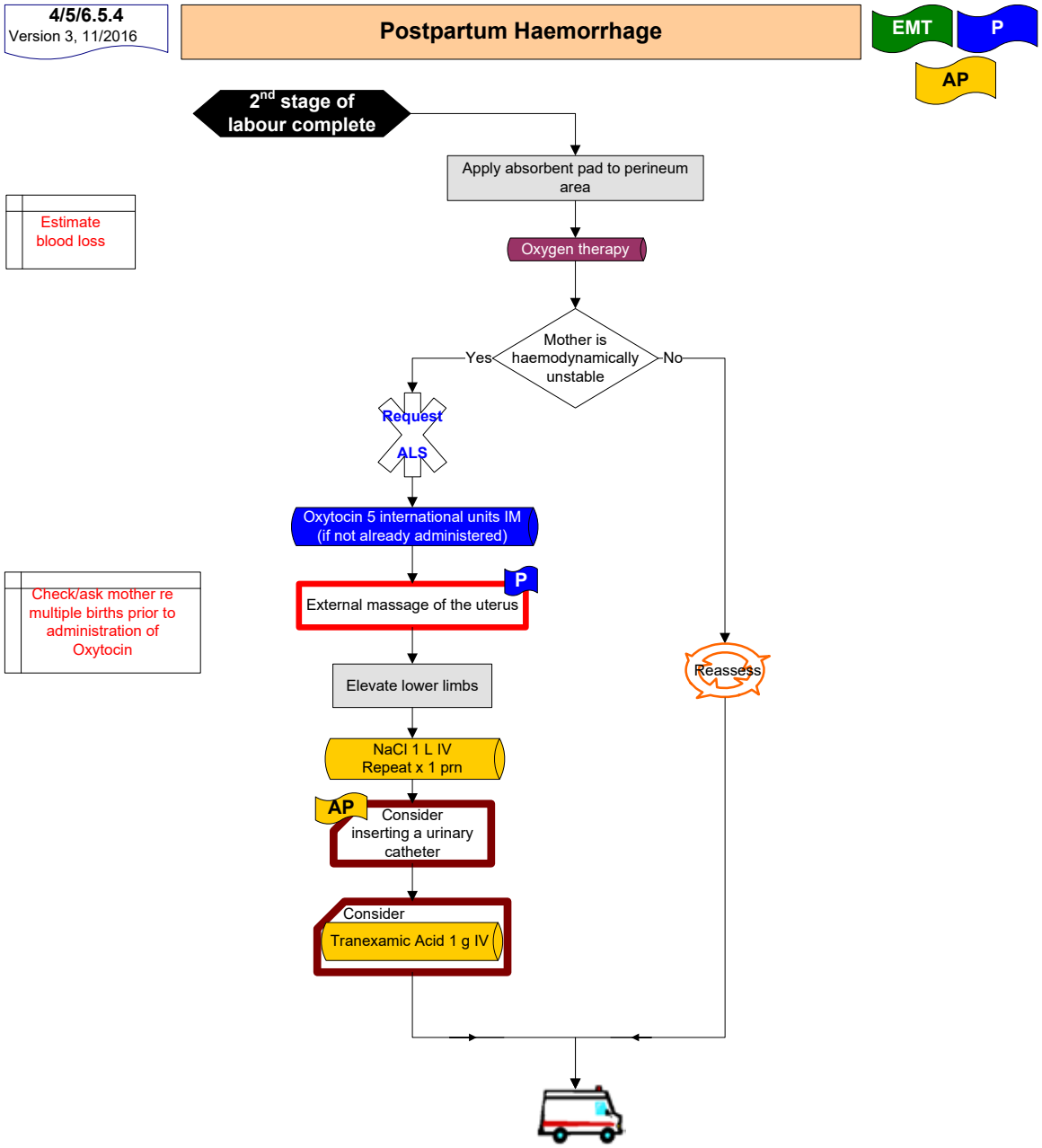
4/5/6.5.3
Version 2, 03/2016

PV Haemorrhage in Pregnancy

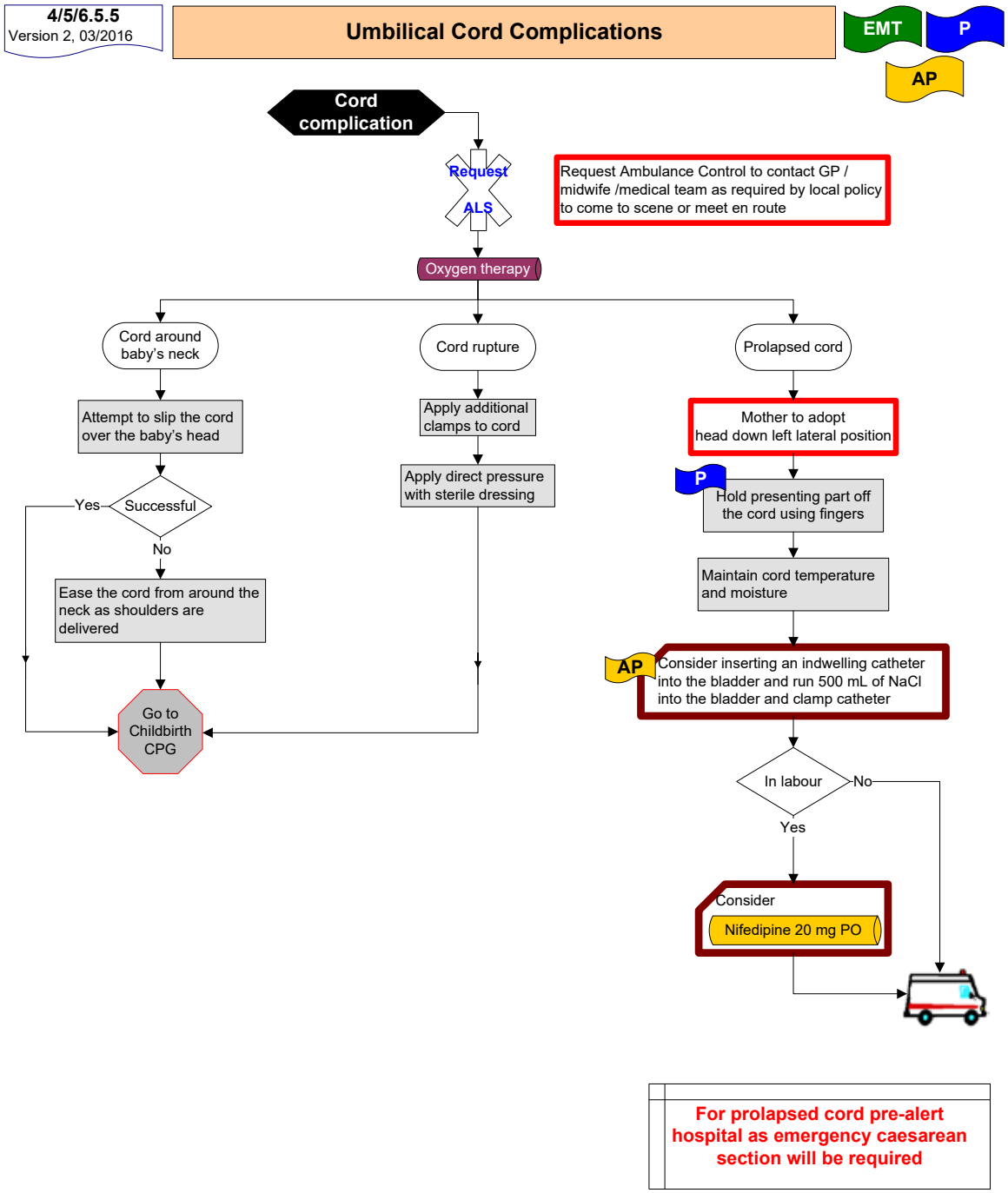
EMT P AP



Reference: Sweet, BR, 2000, Mayes' Midwifery, 12th Edition, Bailleire Tindall



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

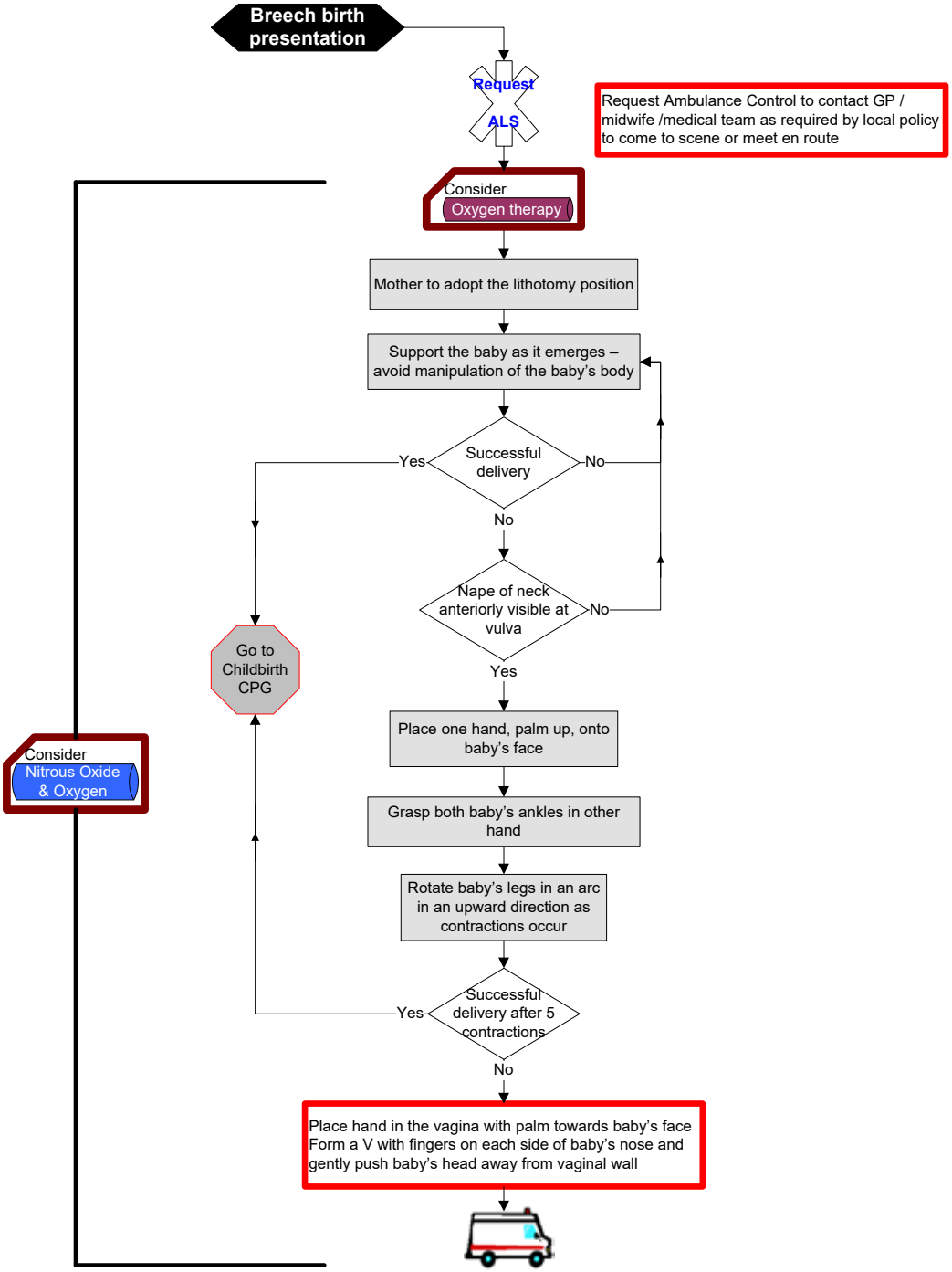


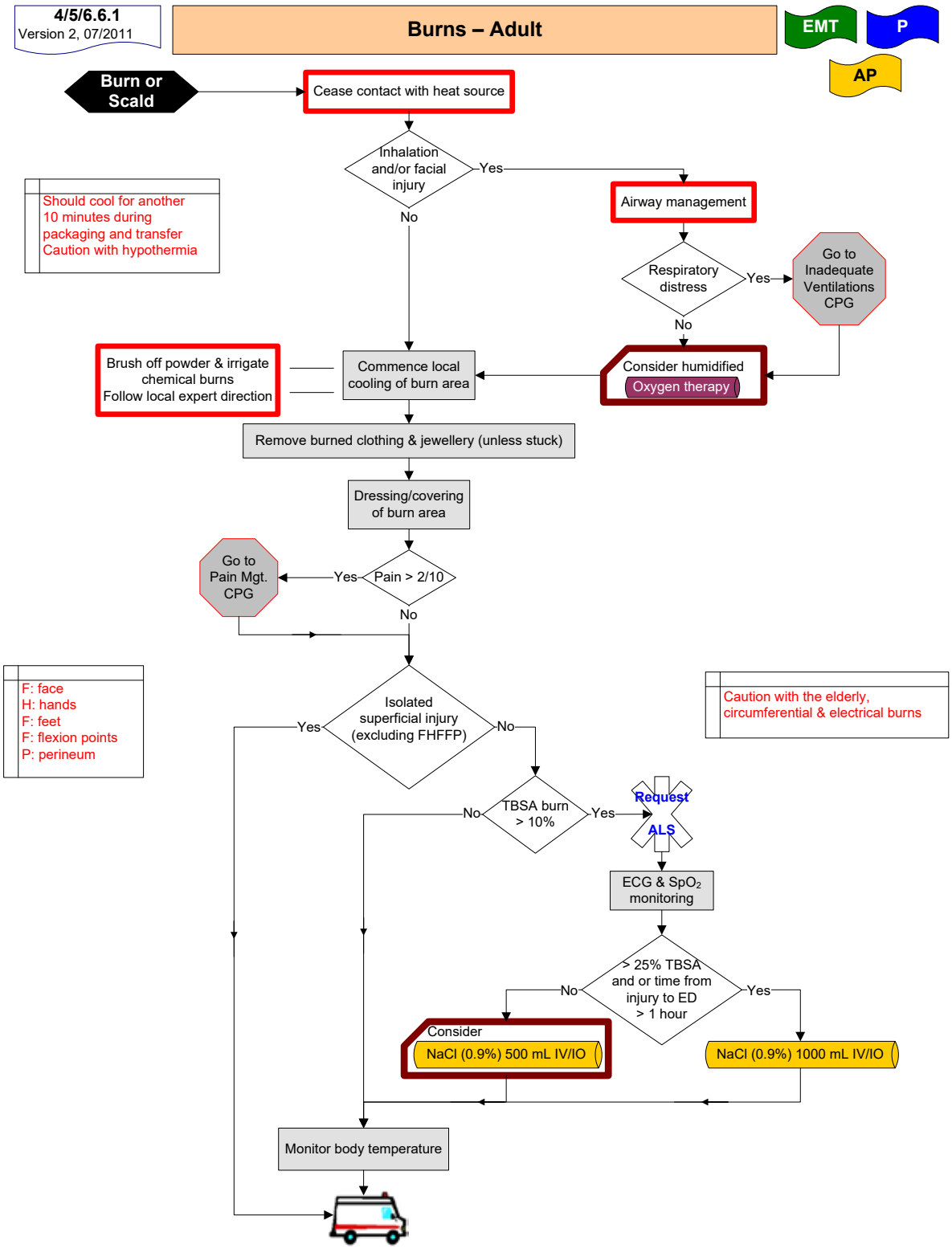
Reference: Sweet, BR, 2000, Mayes' Midwifery, 12th Edition, Bailleire Tindall
Katz Z et al, 1988, Management of labor with umbilical cord prolaps: A 5 year study. Obstet. Gynecol. 72(2): 278-281
Duley, LMM, 2002, Clinical Guideline No 1(B), Tocolytic Drugs for women in preterm labour, Royal College of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

5/6.5.6
Version 2, 03/2016

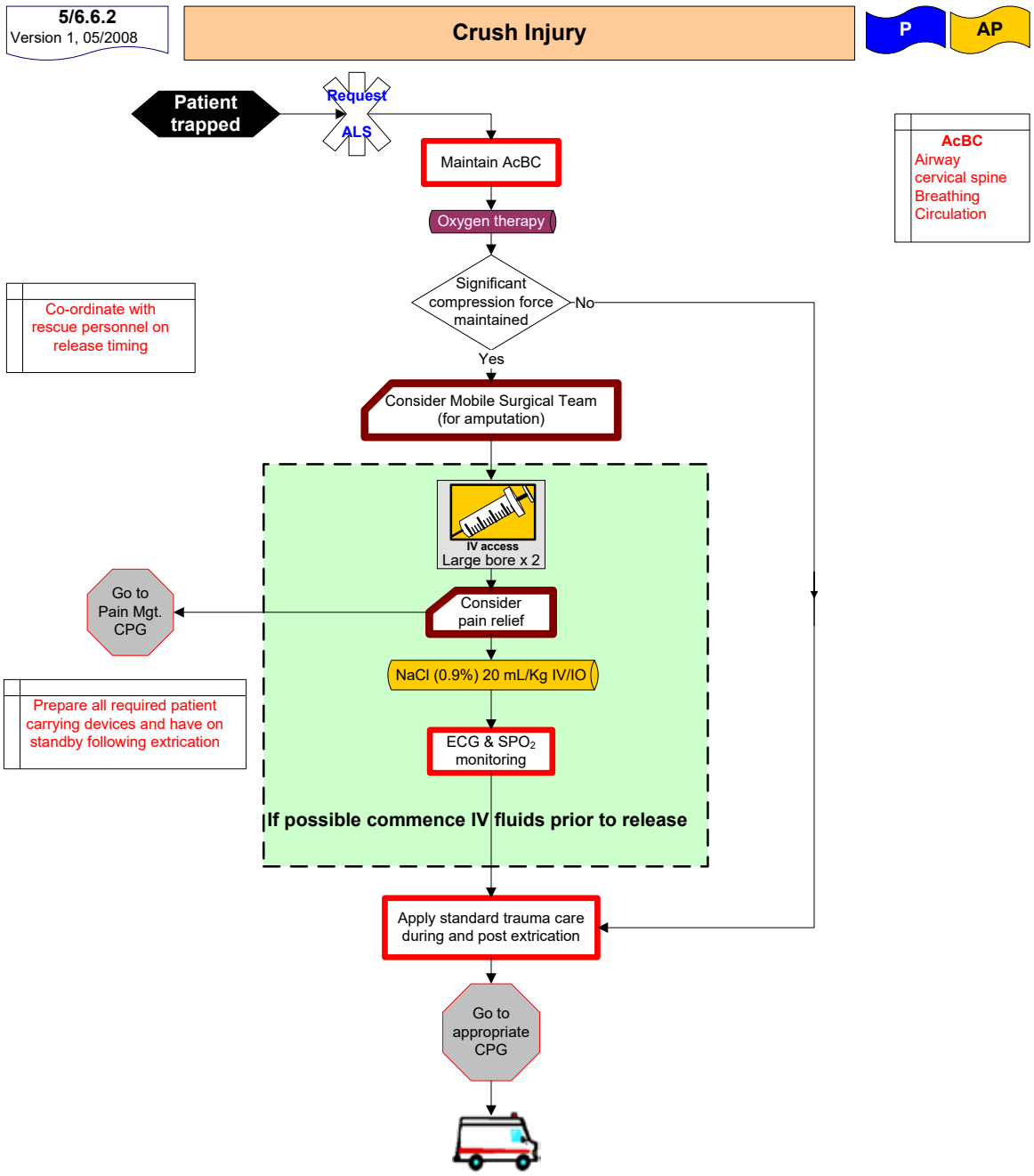
Breech Birth

P AP

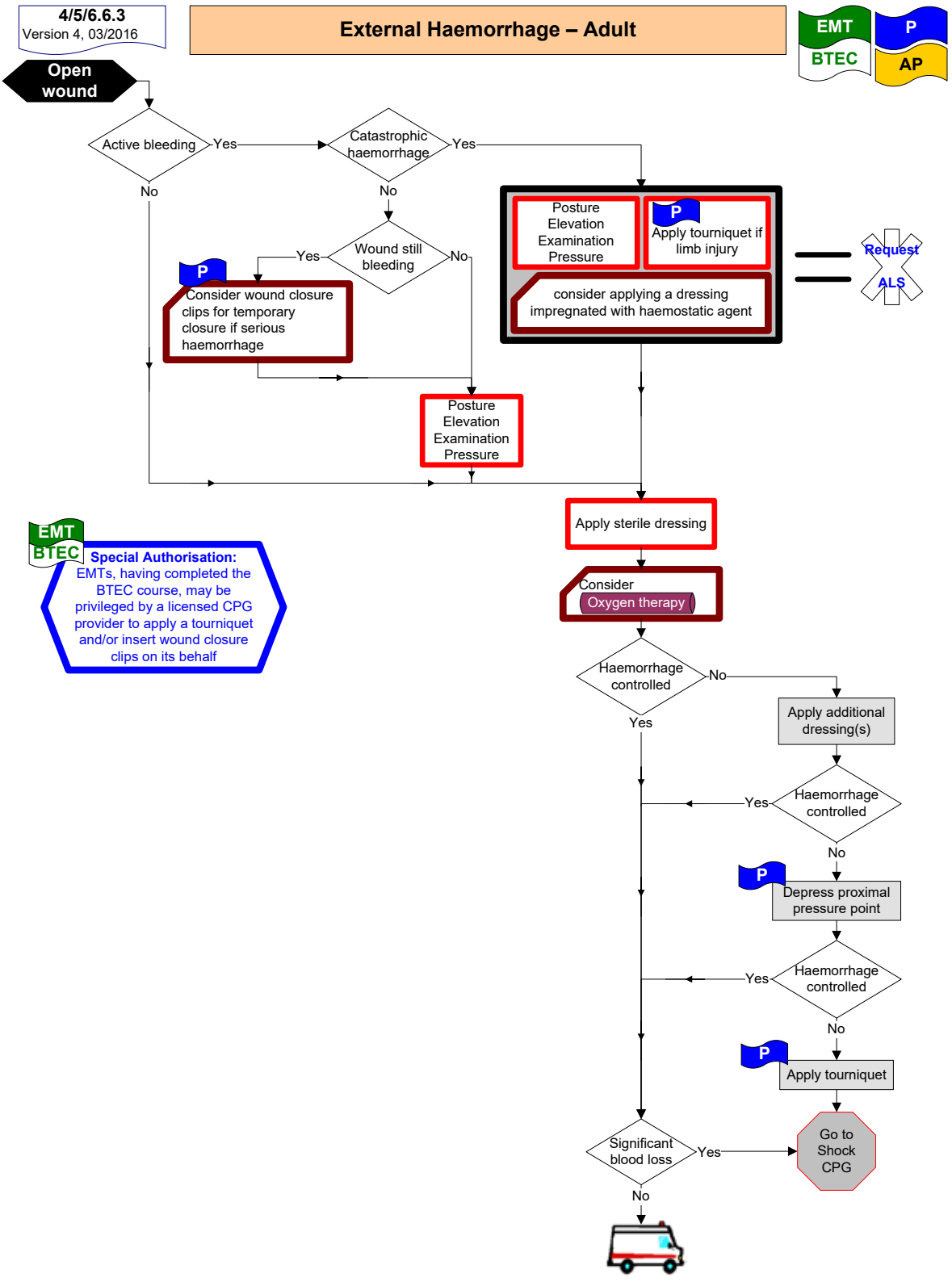




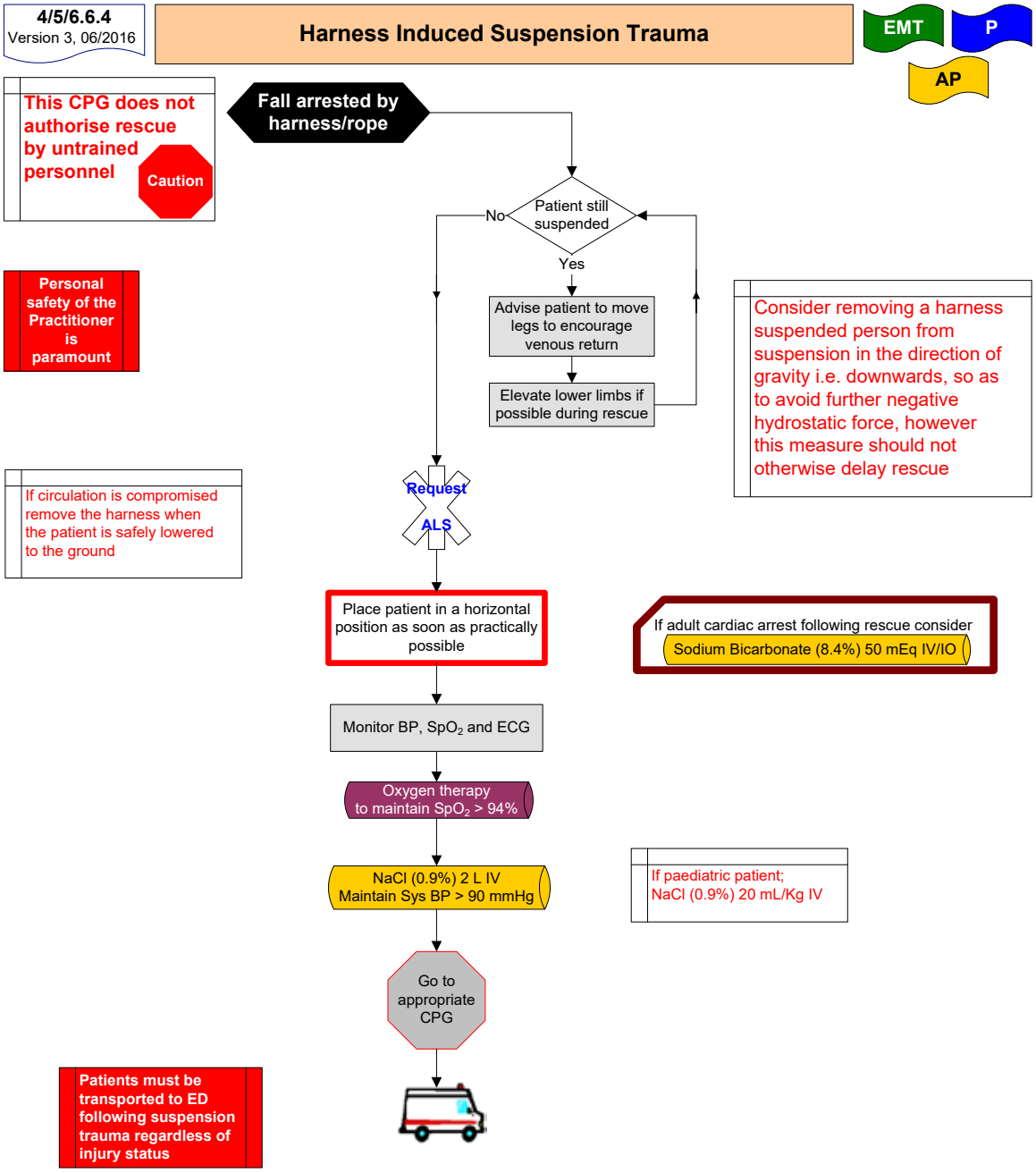
Reference: Allison, K et al, 2004, Consensus on the prehospital approach to burns patient management, Emerg Med J 2004; 21:112-114
Sanders, M, 2001, Paramedic Textbook 2nd Edition, Mosby



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



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

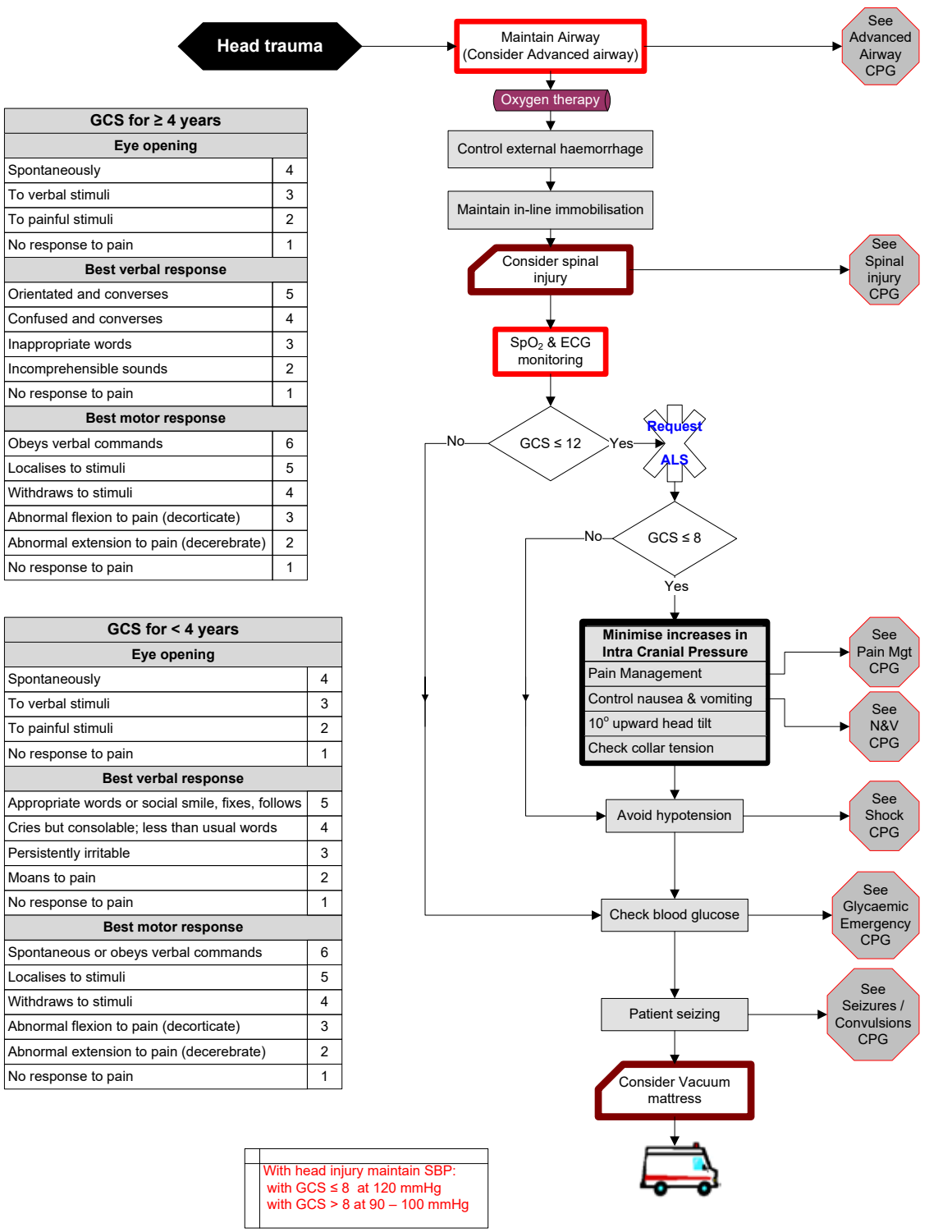


Reference: Adish A et al, 2009, Evidence-based review of the current guidance on first aid measures for suspension trauma, Health and Safety Executive (UK) Research report RR708
Australian Resuscitation Council, 2009, Guideline 9.1.5 Harness Suspension Trauma first aid management.
Thomassen O et al, 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*

5/6.6.5
Version 3, 09/2017

Head Injury

P AP



GCS for ≥ 4 years	
Eye opening	
Spontaneously	4
To verbal stimuli	3
To painful stimuli	2
No response to pain	1
Best verbal response	
Orientated and converses	5
Confused and converses	4
Inappropriate words	3
Incomprehensible sounds	2
No response to pain	1
Best motor response	
Obeys verbal commands	6
Localises to stimuli	5
Withdraws to stimuli	4
Abnormal flexion to pain (decorticate)	3
Abnormal extension to pain (decerebrate)	2
No response to pain	1

GCS for < 4 years	
Eye opening	
Spontaneously	4
To verbal stimuli	3
To painful stimuli	2
No response to pain	1
Best verbal response	
Appropriate words or social smile, fixes, follows	5
Cries but consolable; less than usual words	4
Persistently irritable	3
Moans to pain	2
No response to pain	1
Best motor response	
Spontaneous or obeys verbal commands	6
Localises to stimuli	5
Withdraws to stimuli	4
Abnormal flexion to pain (decorticate)	3
Abnormal extension to pain (decerebrate)	2
No response to pain	1

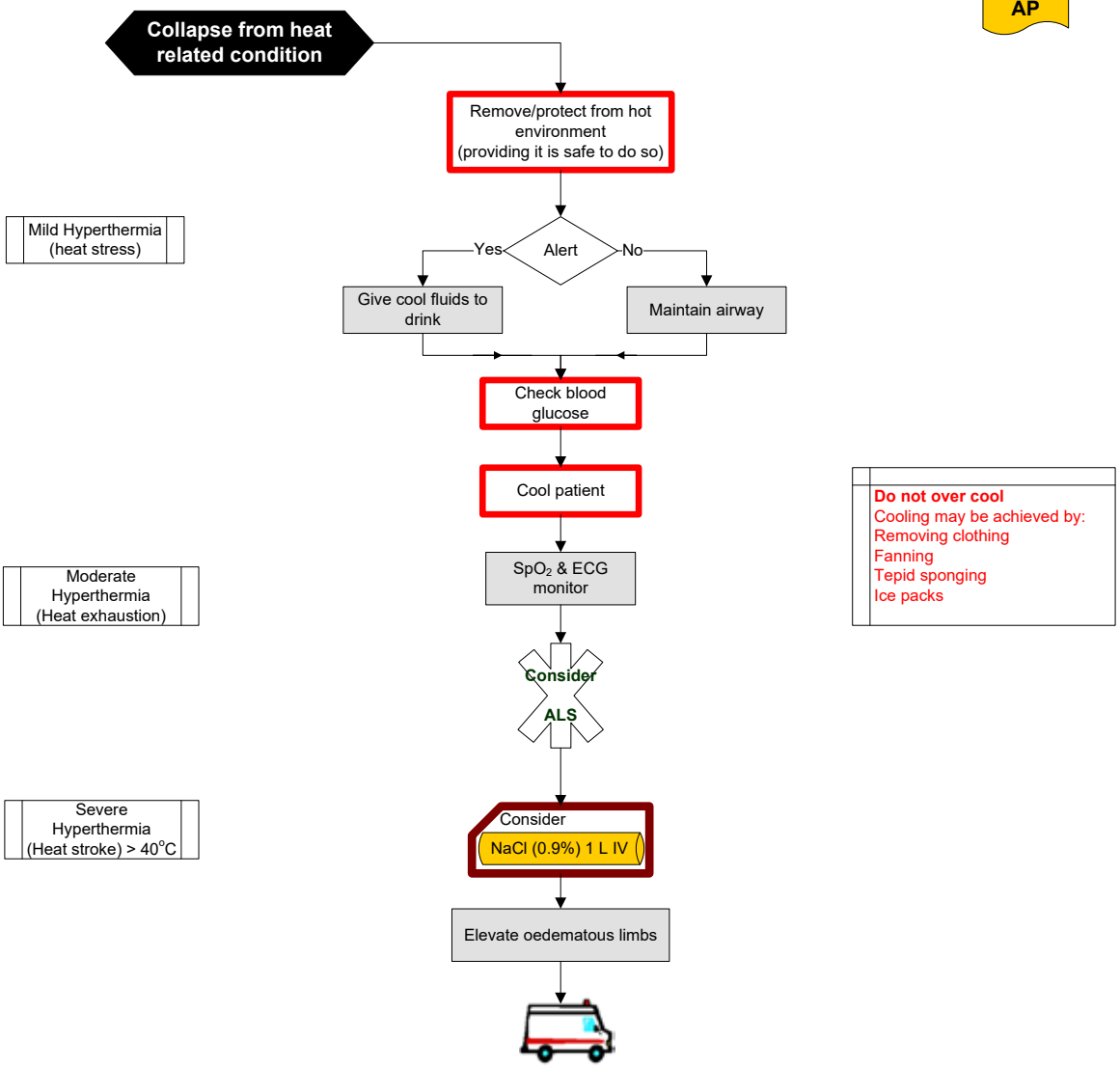
With head injury maintain SBP:
with GCS ≤ 8 at 120 mmHg
with GCS > 8 at 90 – 100 mmHg

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

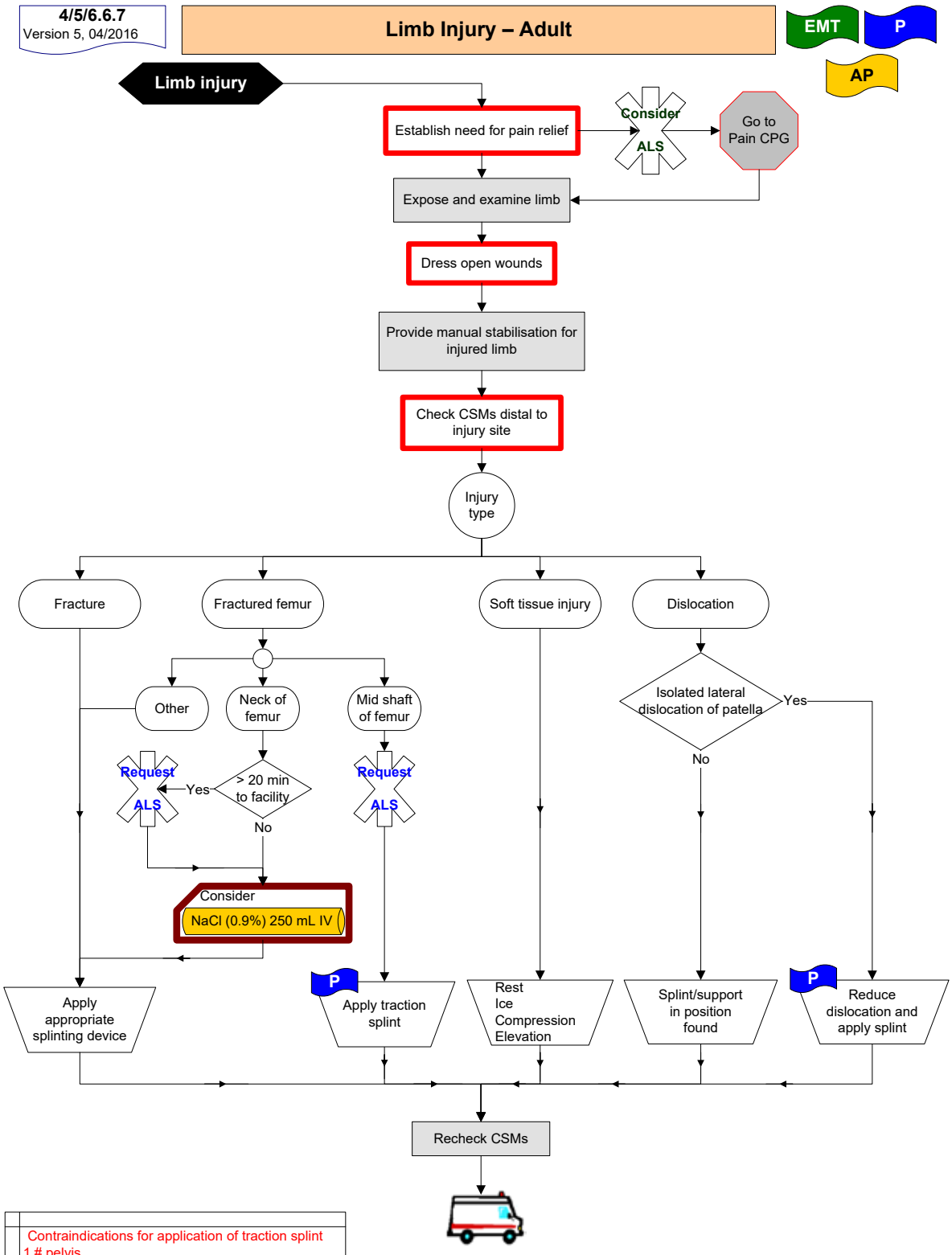
4/5/6.6.6
Version 2, 03/2016

Heat Related Emergency – Adult

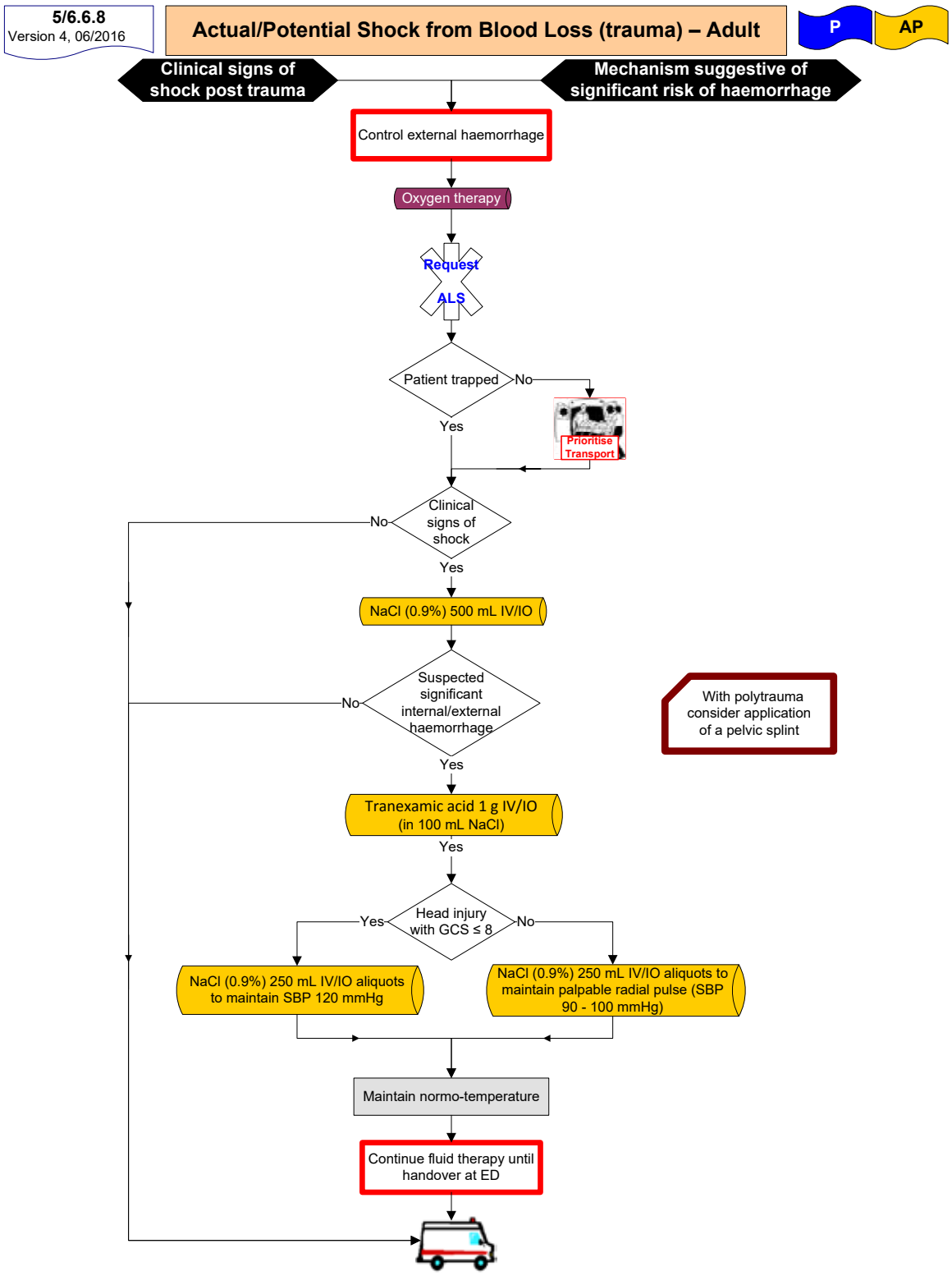
EMT P AP



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



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

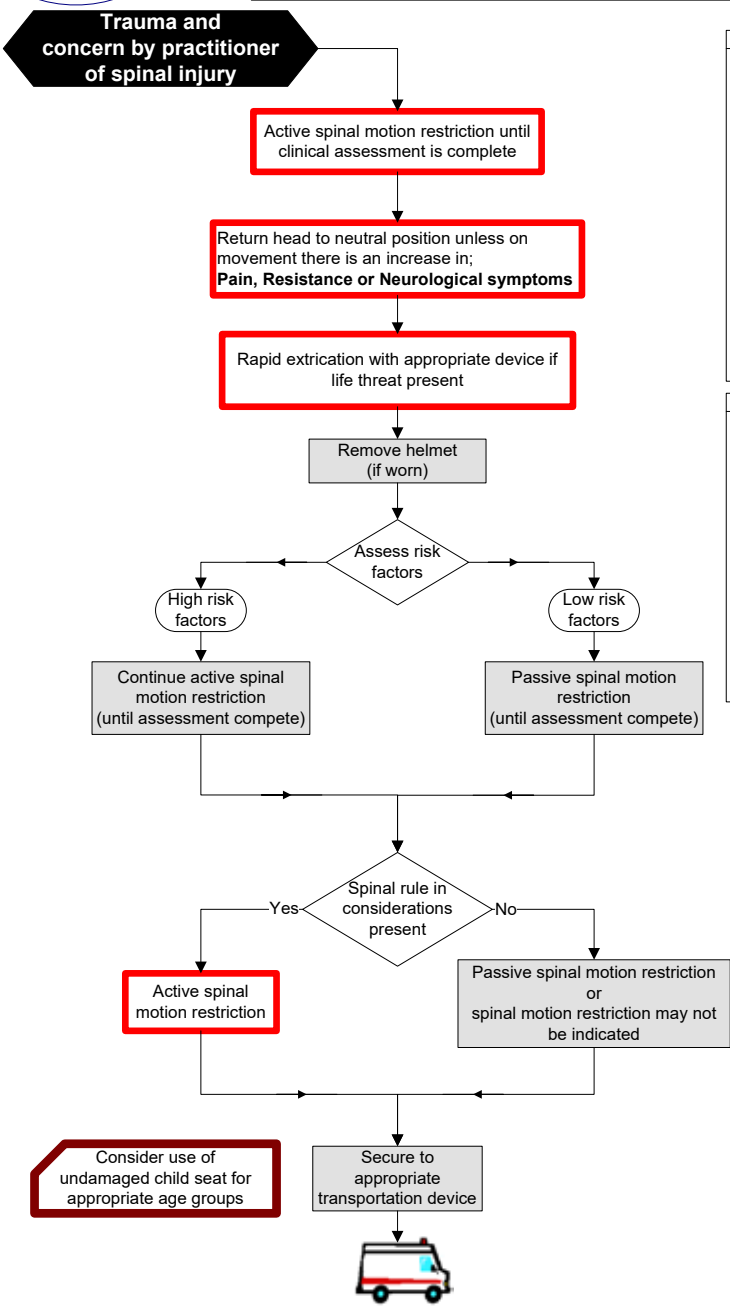


Reference: Gruen, R. L. and M. C. Reade (2012). "Administer tranexamic acid early to injured patients at risk of substantial bleeding." BMJ **345**: e7133
Leech, C., et al. (2014). "Log-rolling a blunt major trauma patient is inappropriate in the primary survey." Emerg Med J **31**(1): 86

5/6.6.9
Version 4, 12/2017

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
- age 2 years or younger incapable of verbal communication

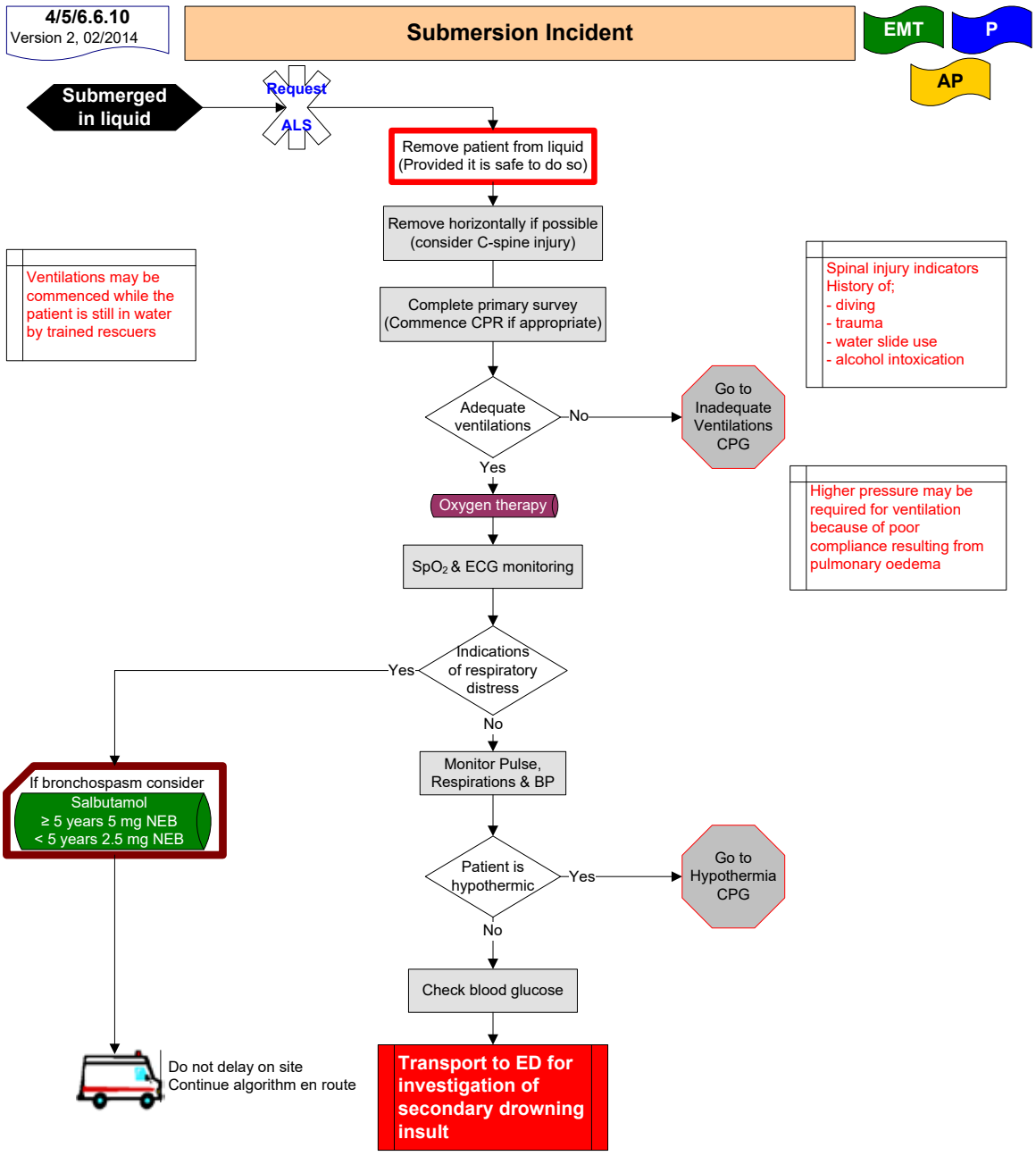
Spinal injury rule in considerations;
- any significant distracting injuries
- impaired awareness (alcohol/ drug intoxication, confused /uncooperative or ALoC)
- immediate onset of spinal/ midline back pain
- hand or foot weakness (motor issue)
- altered or absent sensation in the hands or feet (sensory 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 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.

Unlikely to have a clinically significant spinal injury
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

Reference: PHECC Pre-hospital spinal injury management standard STN 024 Version 2

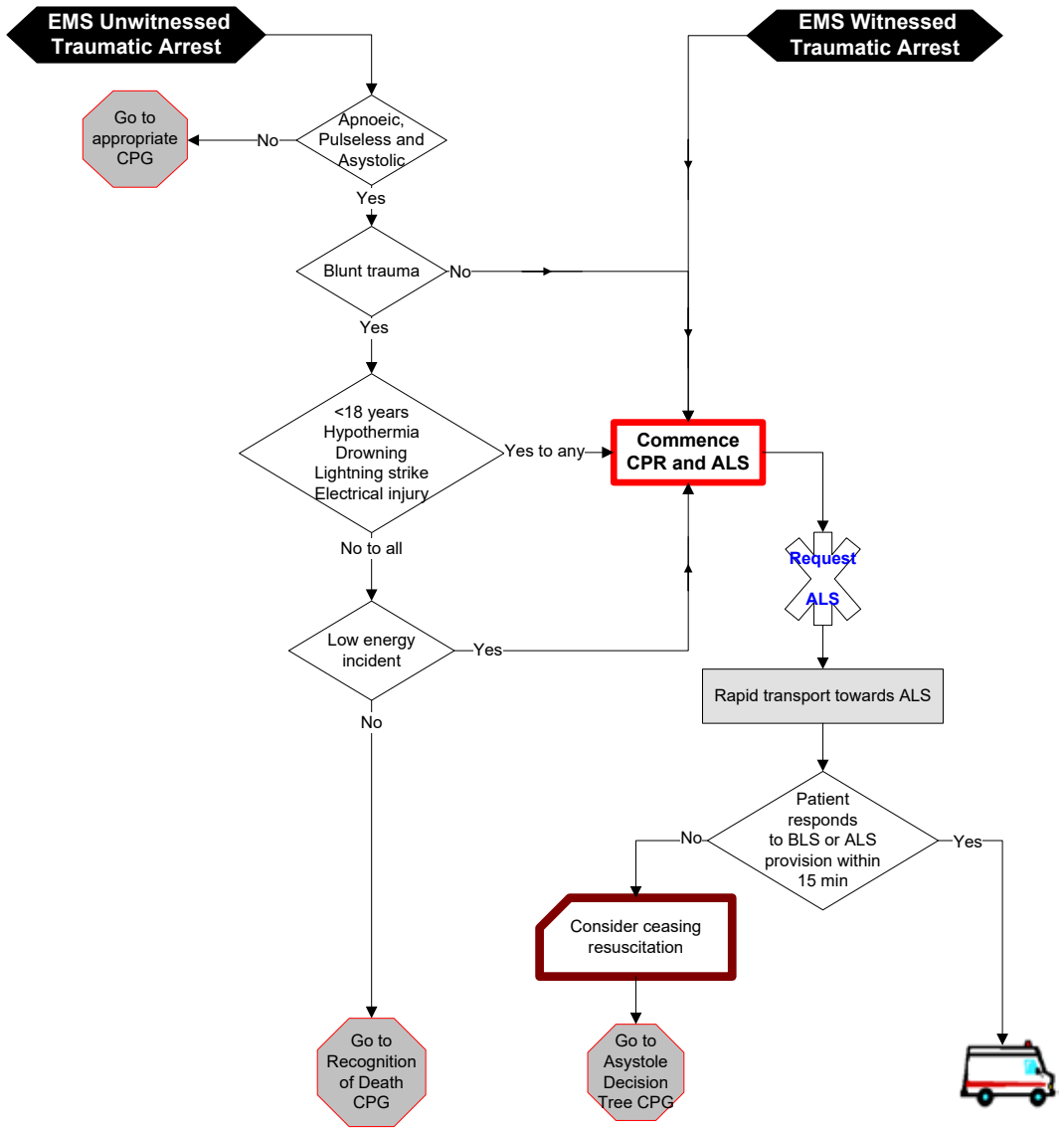


Reference: Golden, F & Tipton M, 2002, Essentials of Sea Survival, Human Kinetics
Verie, M, 2007, Near Drowning, E medicine, www.emedicine.com/ped/topic20570.htm
Shepherd, S, 2005, Submersion Injury, Near Drowning, E Medicine, www.emedicine.com/emerg/topic744.htm
AHA, 2005, Part 10.3: Drowning, Circulation 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

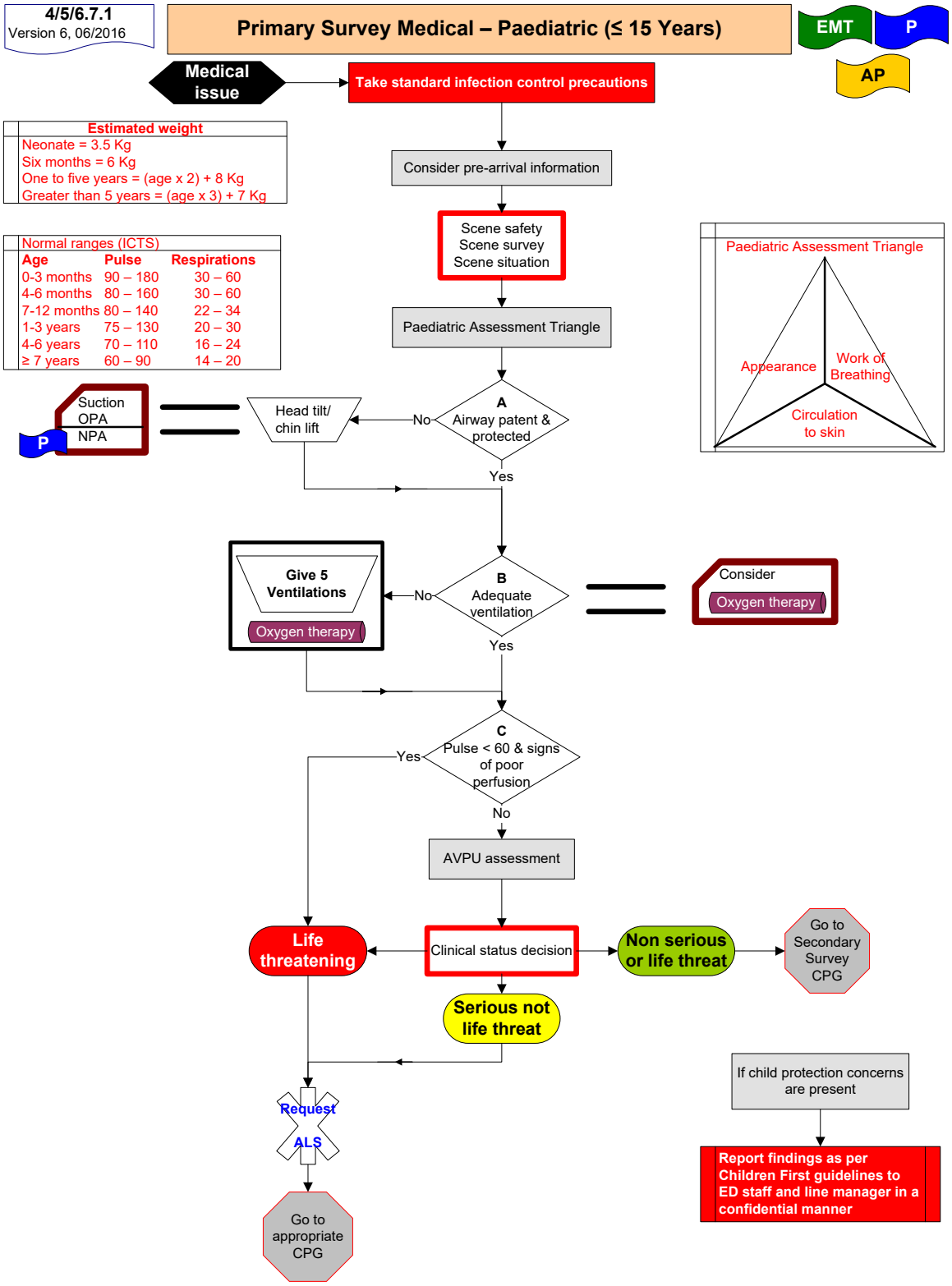
5/6.6.11
Version 1, 05/2008

Traumatic Cardiac Arrest – Adult

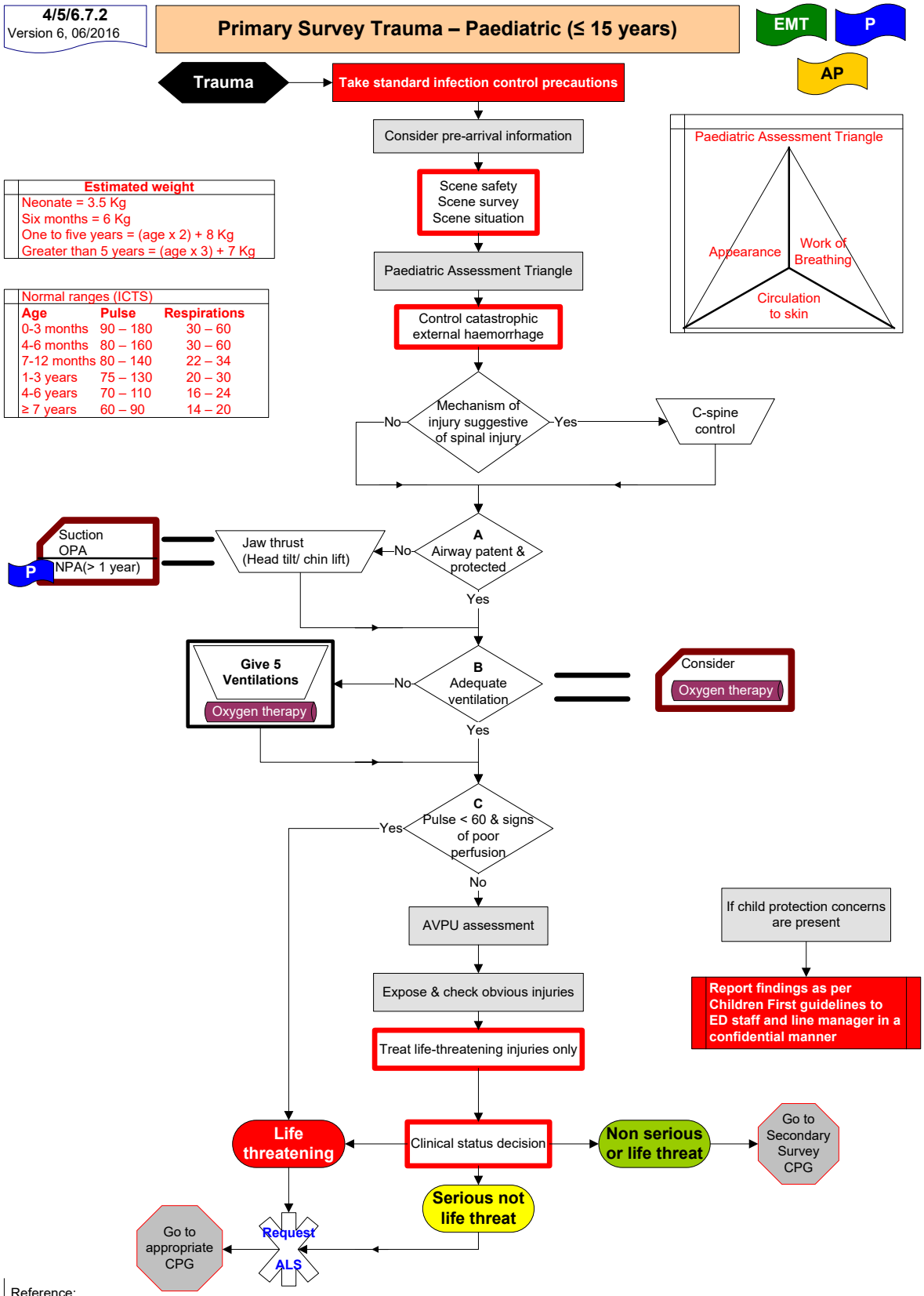
P AP



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



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

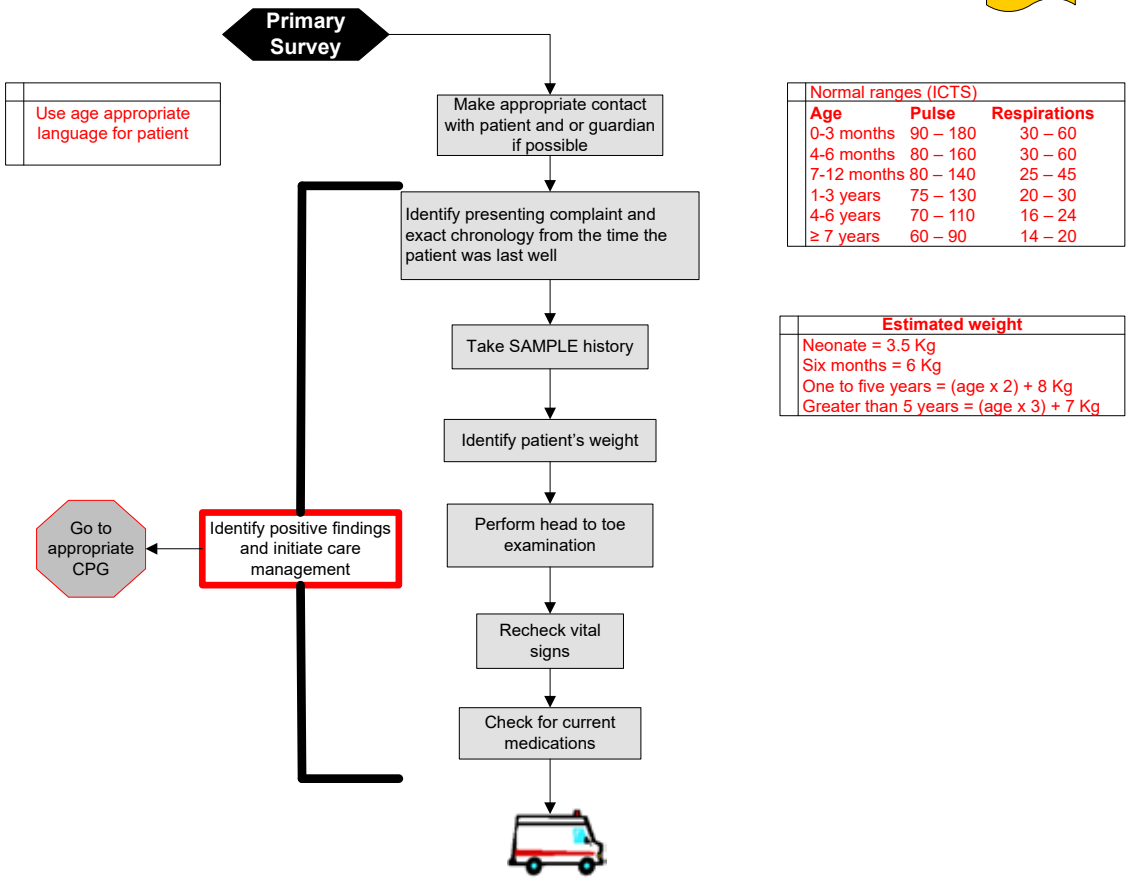


Reference:
ILCOR Guidelines 2015, American Academy of Pediatrics, 2000, Pediatric Education for Prehospital Professionals
Department of Children and Youth Affairs, 2011, Children First: National Guidance for the Protection and Welfare of Children
Irish Children's Triage System: National Emergency Medicine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

4/5/6.7.4
Version 4, O6/2016

Secondary Survey – Paediatric (≤ 15 years)

EMT P AP



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	25 – 45
1-3 years	75 – 130	20 – 30
4-6 years	70 – 110	16 – 24
≥ 7 years	60 – 90	14 – 20

Estimated weight

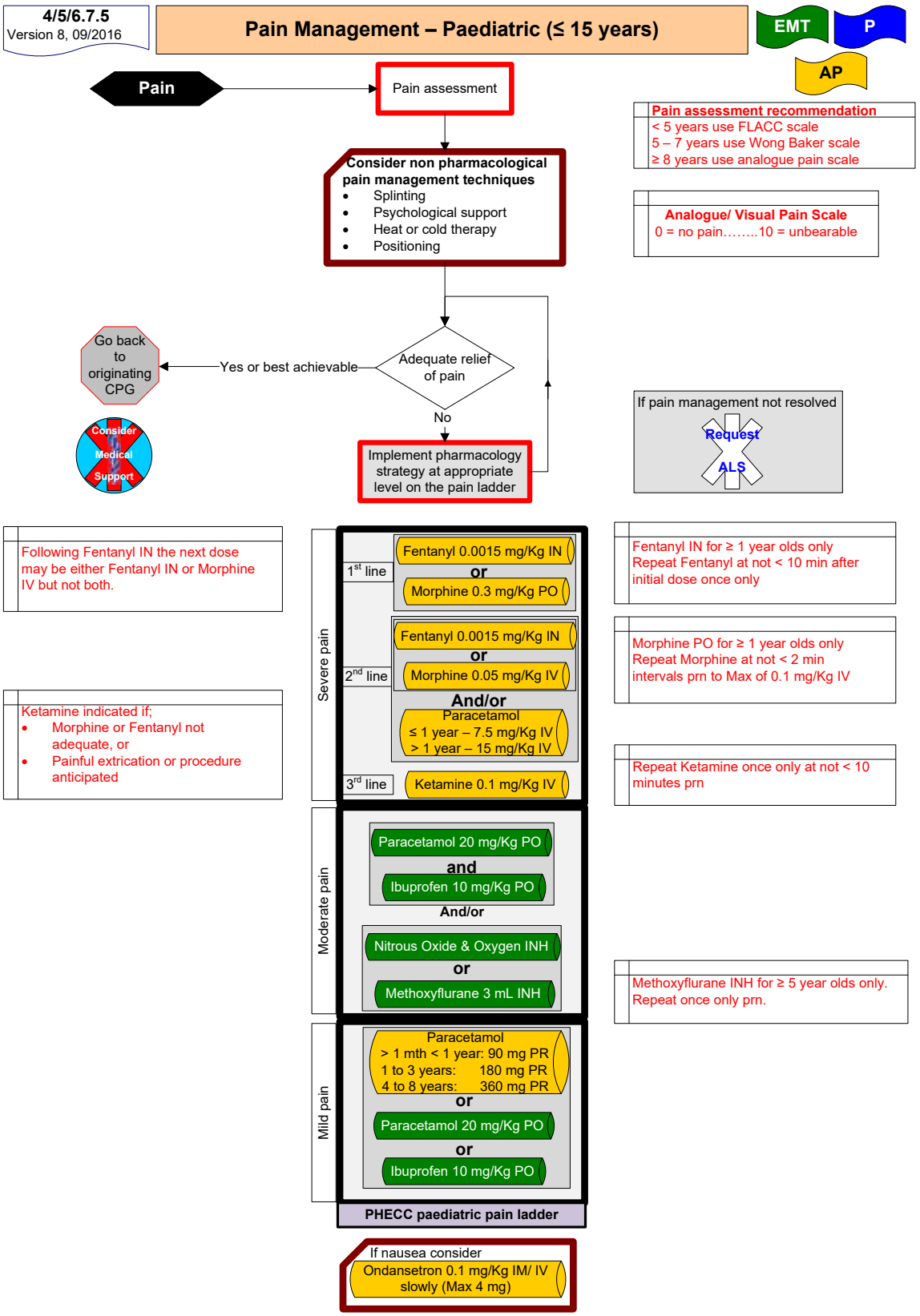
Neonate = 3.5 Kg
Six months = 6 Kg
One to five years = (age x 2) + 8 Kg
Greater than 5 years = (age x 3) + 7 Kg

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

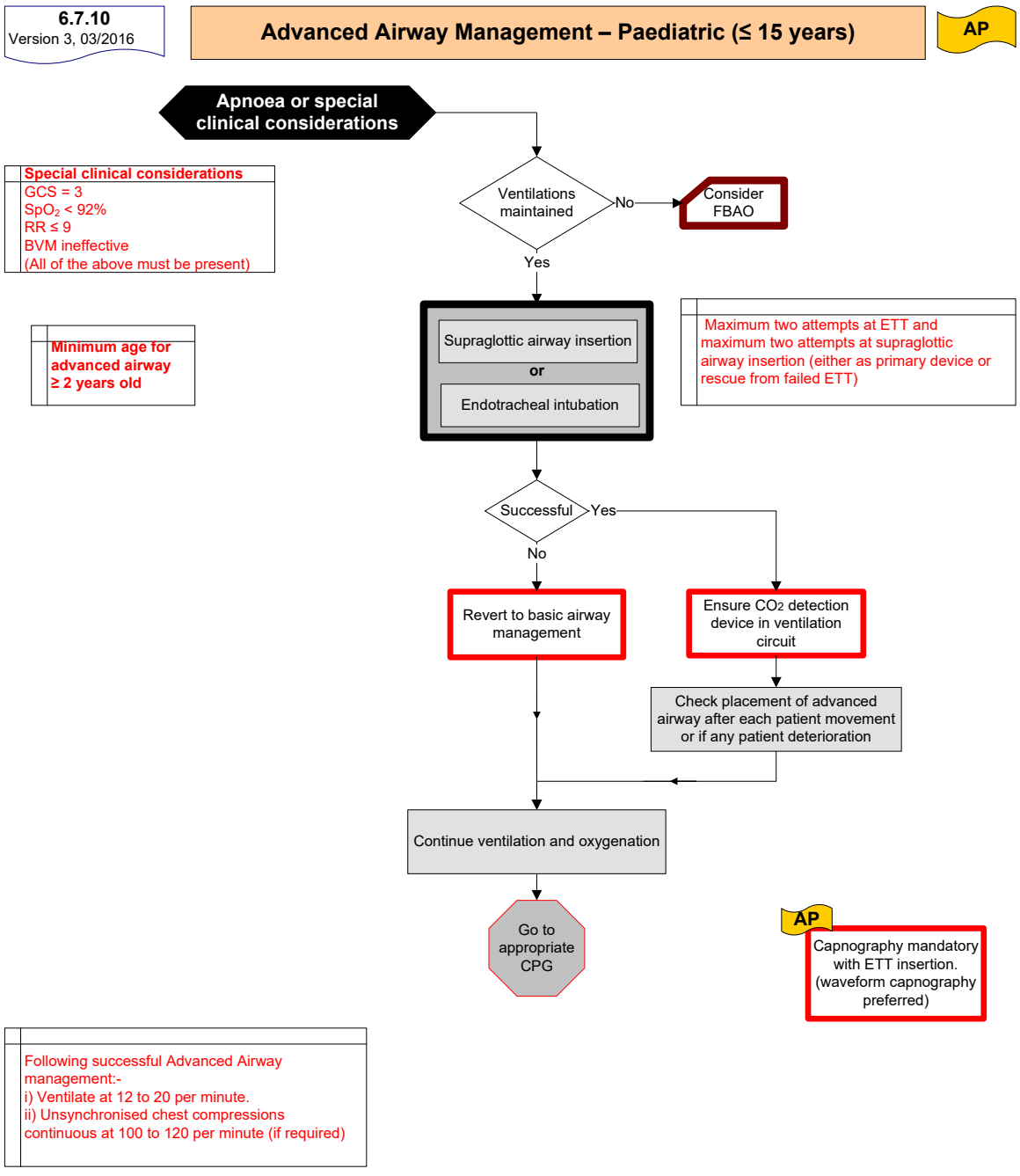
If child protection concerns are present

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

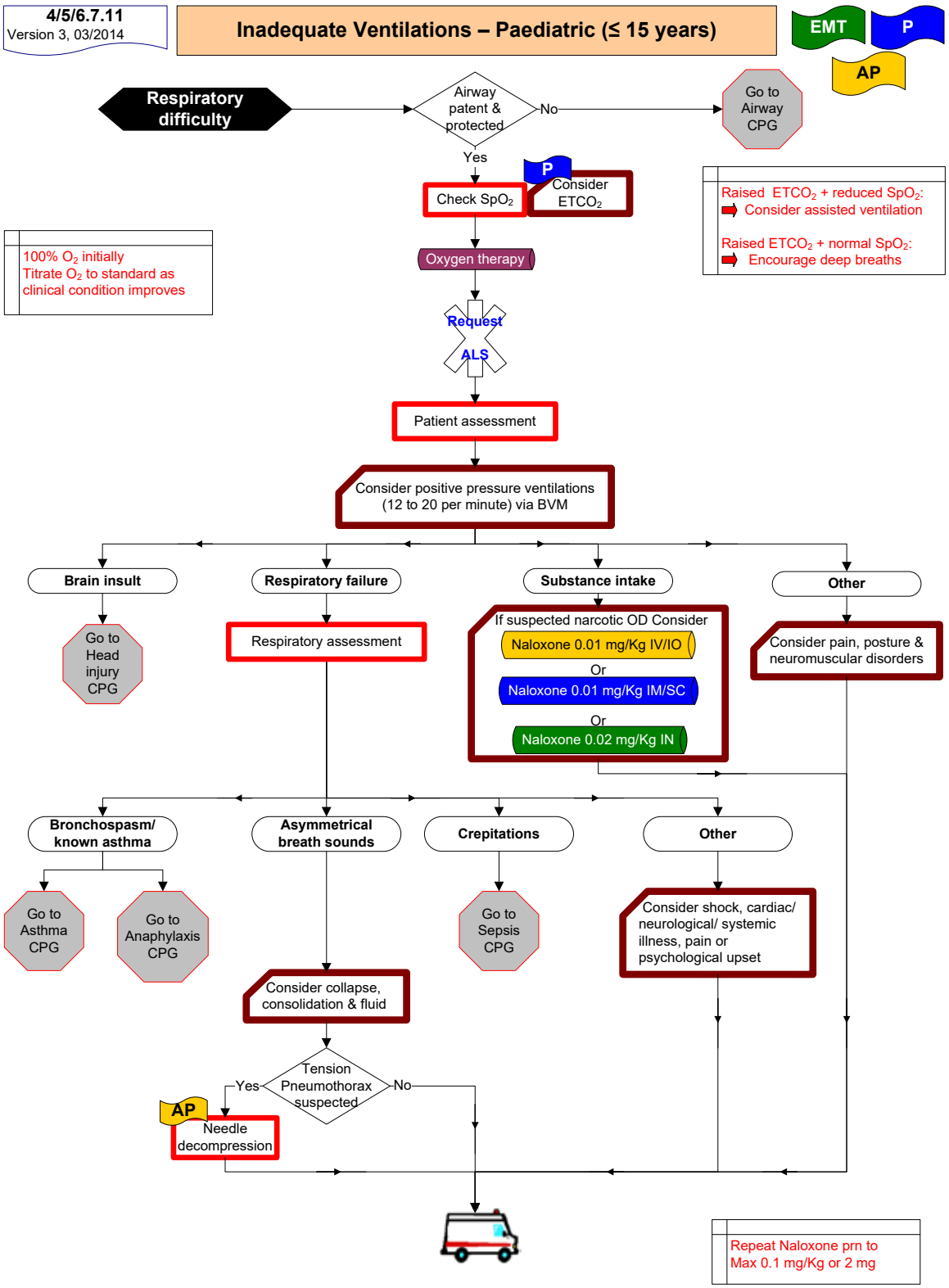
Reference:
Miall, Lawrence et al, 2003, Paediatrics at a Glance, Blackwell Publishing
Department of Children and Youth Affairs, 2011, Children First: National Guidance for the Protection and Welfare of Children
Luscombe, M et al 2010, BMJ, Weight estimation in paediatrics: a comparison of the APLS formula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

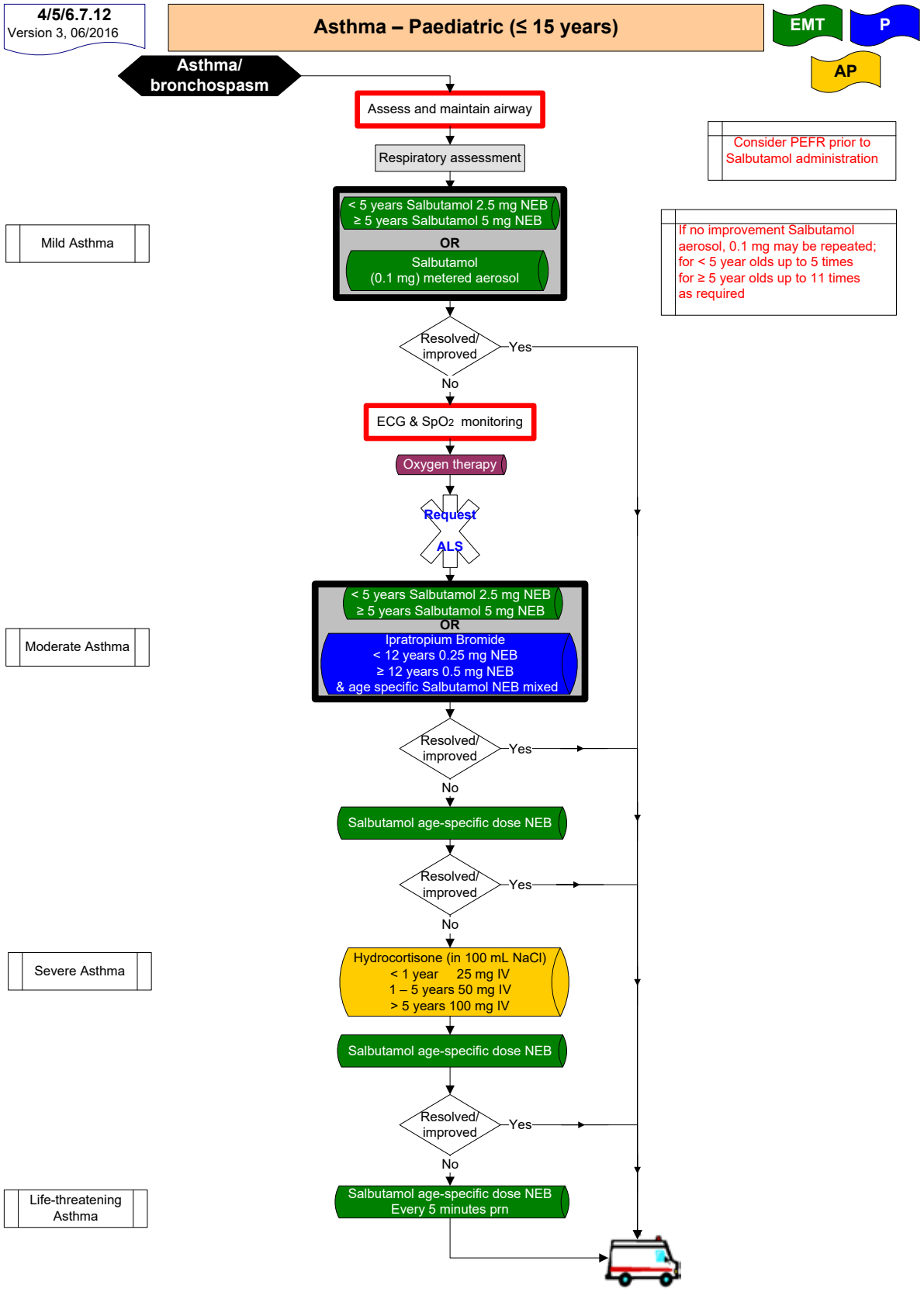


Reference: Coffey, F., et al. (2014). "STOP!: a randomised, double-blind, placebo-controlled study of the efficacy and safety of methoxyflurane for the treatment of acute pain." Emerg Med J **31**(8): 613-618
Jennings, P. A., et al. (2011). "Ketamine as an analgesic in the pre-hospital setting: a systematic 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

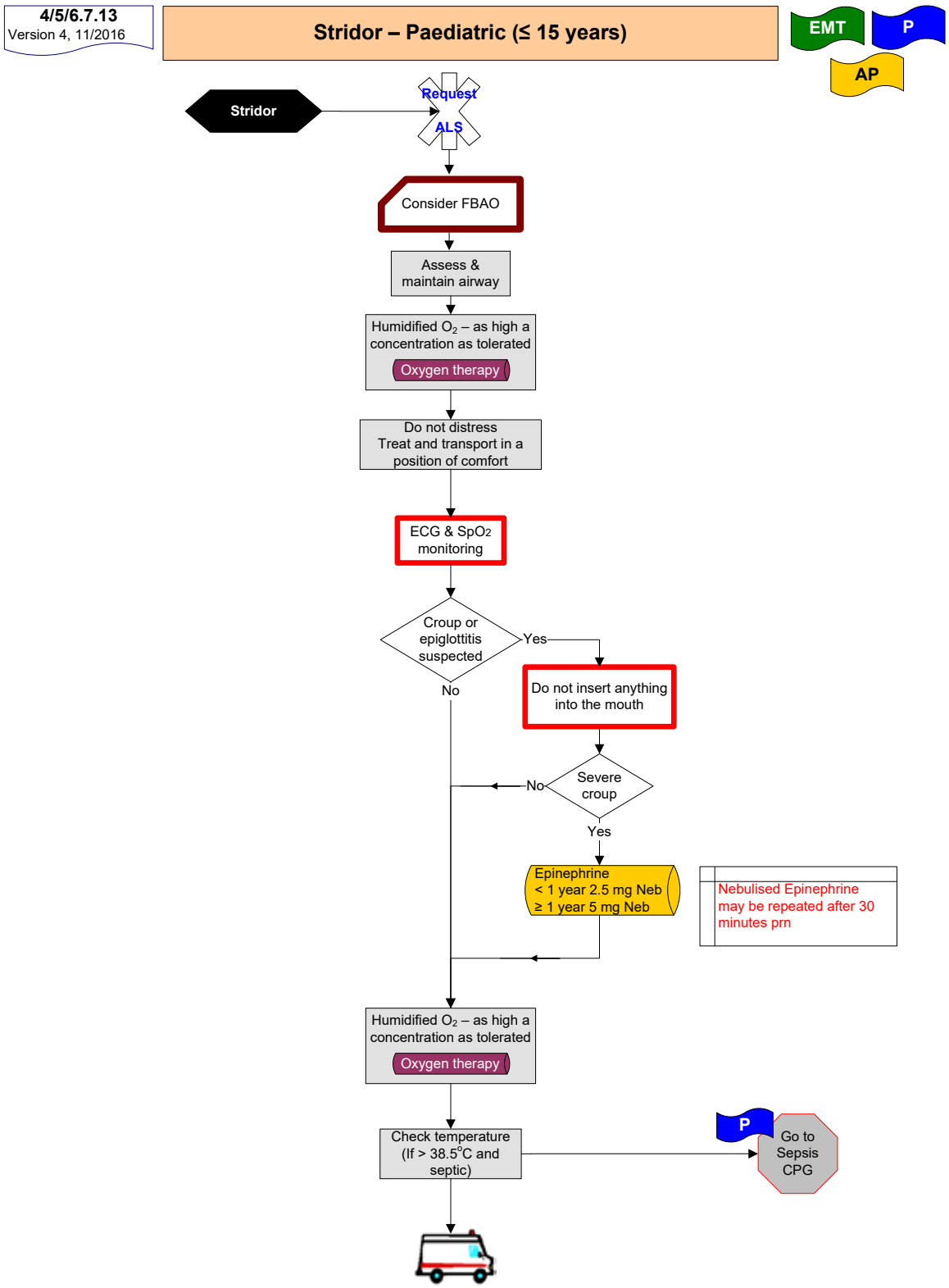


Reference: ILCOR Guidelines 2015
Paediatric basic and advanced life support


4/5/6.7.11
Version 3, 03/2014
Inadequate Ventilations – Paediatric (≤ 15 years)
EMT
P
AP
Respiratory difficulty
Airway patent & protected
No
Go to Airway CPG
Yes
P
Check SpO2
Consider ETCO2
Raised ETCO2 + reduced SpO2:
Consider assisted ventilation
Raised ETCO2 + normal SpO2:
Encourage deep breaths
100% O2 initially
Titrate O2 to standard as clinical condition improves
Oxygen therapy
Request ALS
Patient assessment
Consider positive pressure ventilations (12 to 20 per minute) via BVM
Brain insult
Respiratory failure
Substance intake
Other
Go to Head injury CPG
Respiratory assessment
If suspected narcotic OD Consider
Naloxone 0.01 mg/Kg IV/IO
Or
Naloxone 0.01 mg/Kg IM/SC
Or
Naloxone 0.02 mg/Kg IN
Consider pain, posture & neuromuscular disorders
Bronchospasm/ known asthma
Asymmetrical breath sounds
Crepitations
Other
Go to Asthma CPG
Go to Anaphylaxis CPG
Go to Sepsis CPG
Consider shock, cardiac/ neurological/ systemic illness, pain or psychological upset
Consider collapse, consolidation & fluid
Tension Pneumothorax suspected
Yes
No
AP
Needle decompression
Repeat Naloxone prn to Max 0.1 mg/Kg or 2 mg



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



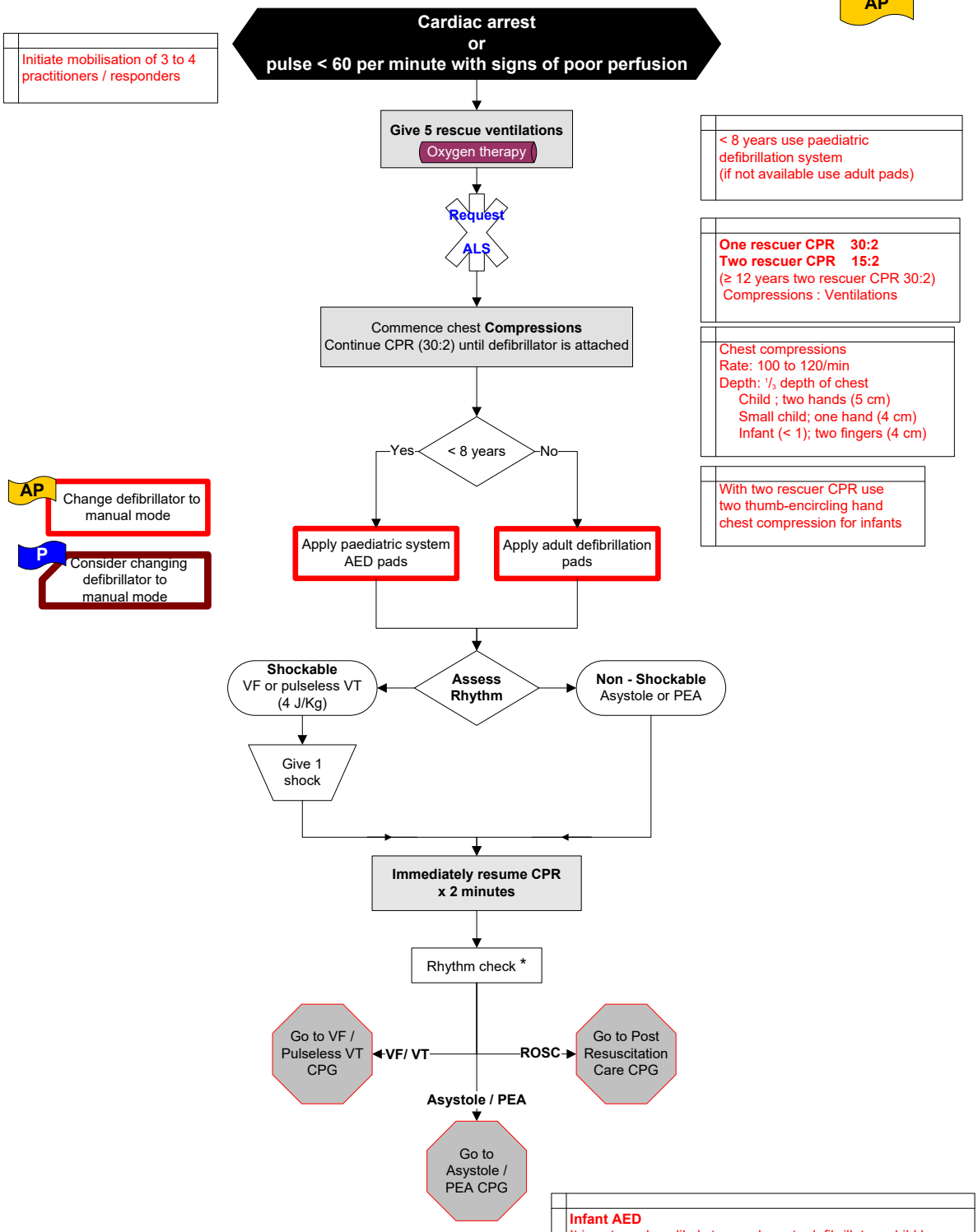
Reference: BNF for children 2015 - 2016

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

4/5/6.7.20
Version 3, 03/2016

Basic Life Support – Paediatric (≤ 15 Years)

EMT P AP



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.

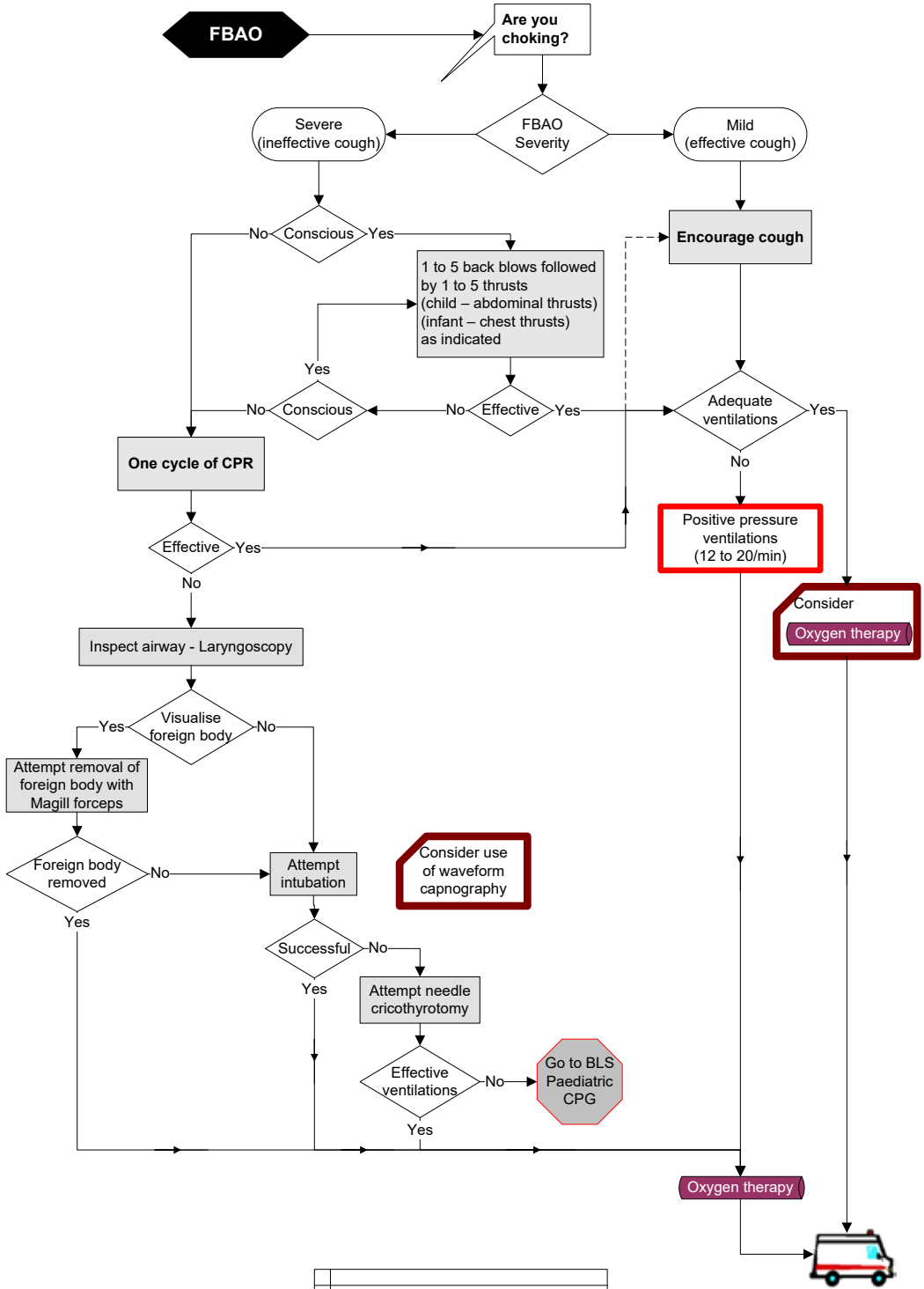
* +/- Pulse check: pulse check after 2 minutes of CPR if potentially perfusing rhythm

Reference: ILCOR Guidelines 2015

6.7.21
Version 3, 03/2016

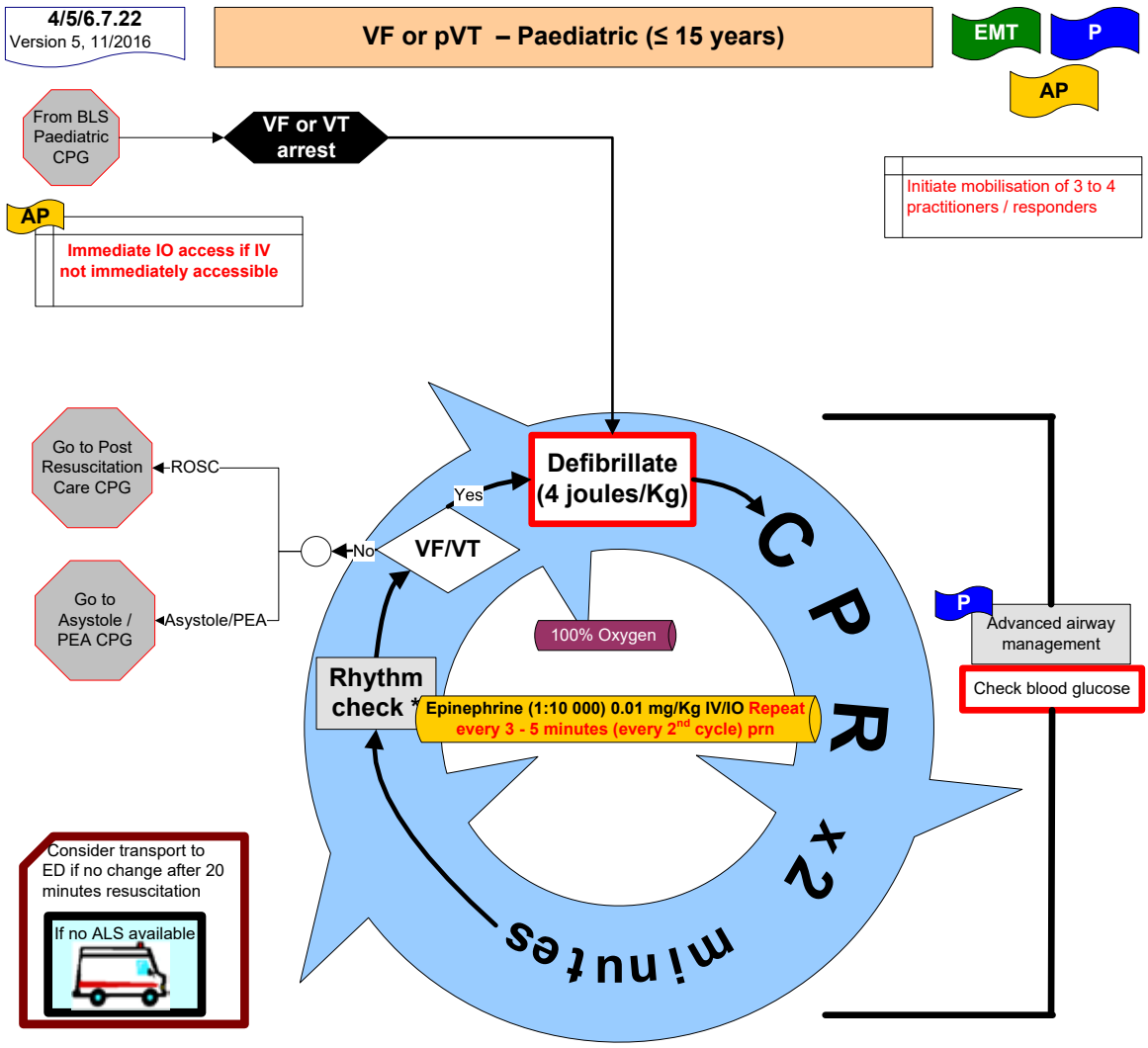
Foreign Body Airway Obstruction – Paediatric (≤ 15 years)

AP



After each cycle of CPR open mouth and look for object.
If visible attempt once to remove it.

Reference:
ILCOR Guidelines 2015



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

If refractory VF/pVT post Epinephrine and 3rd shock
Amiodarone 5 mg/Kg IV/IO

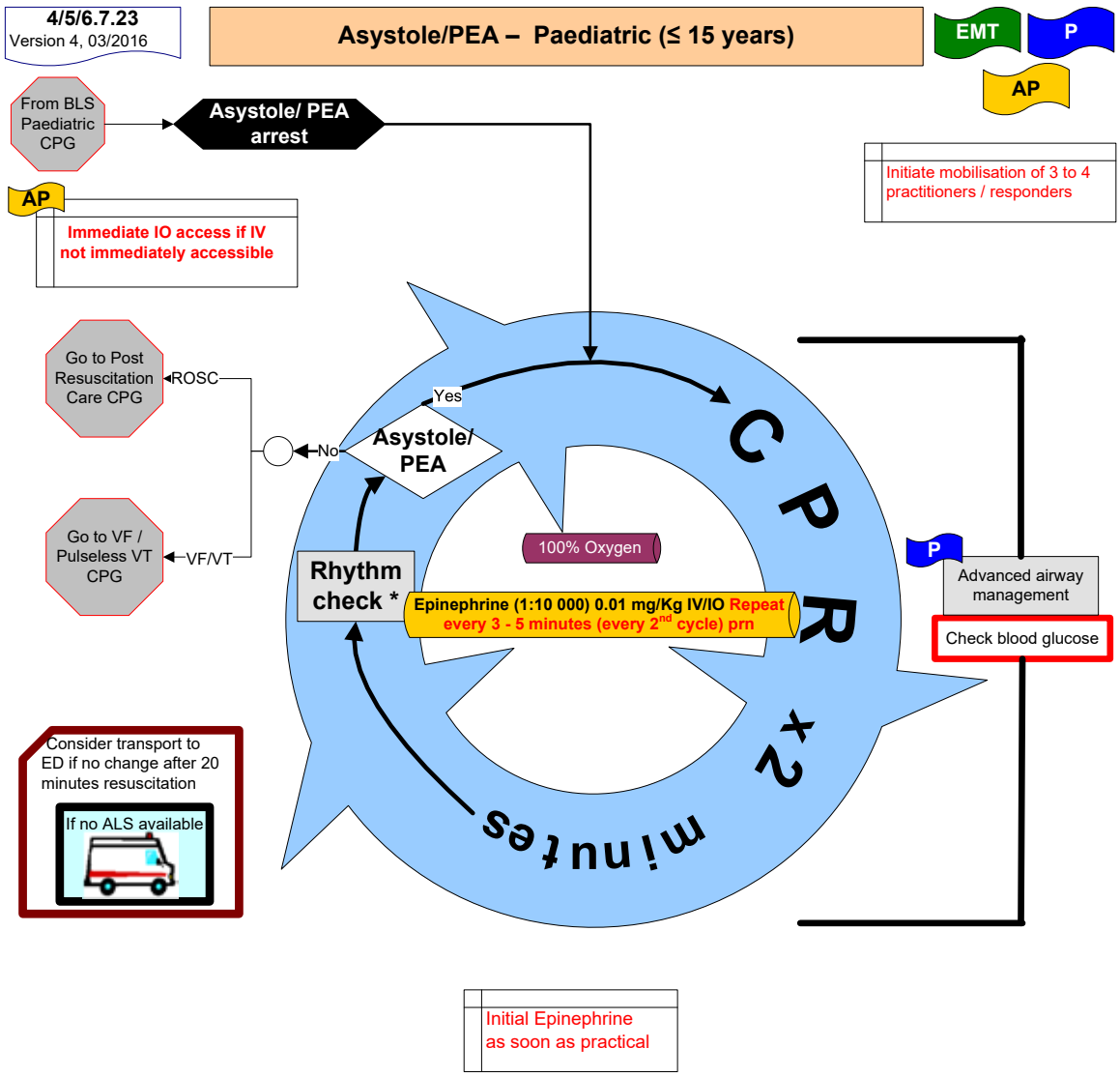
AP
Special Authorisation:
Advanced Paramedics are authorised to substitute Amiodarone with a one off bolus of Lidocaine (1-1.5 mg/Kg IV) if Amiodarone is not available

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



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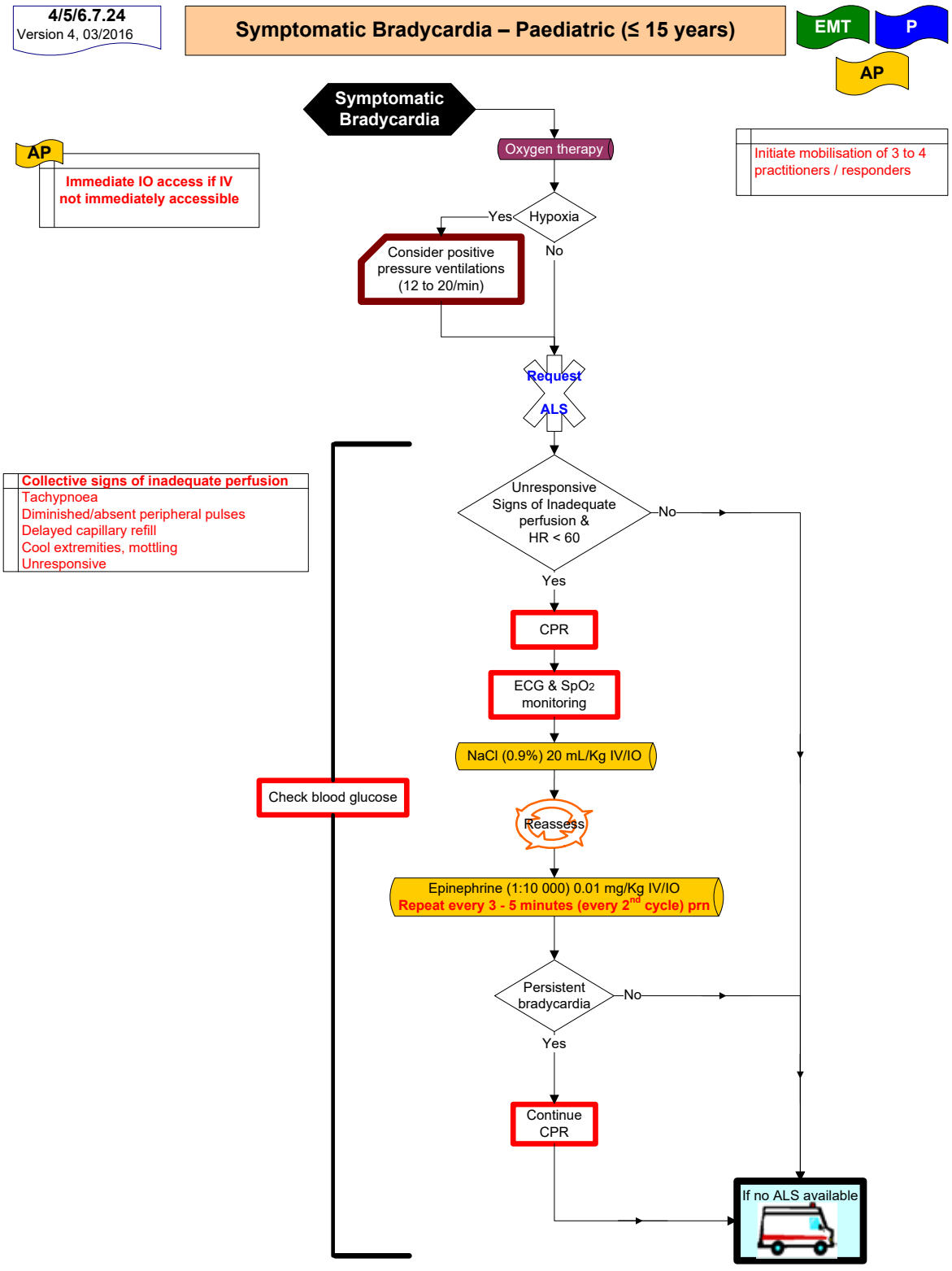
- Hydrogen ion acidosis
- Hyper/ hypokalaemia
- **Hypothermia**
- **Hypovolaemia**
- **Hypoxia**
- Thrombosis – pulmonary
- **Tension pneumothorax**
- Thrombus – coronary
- Tamponade – cardiac
- Toxins
- Trauma

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



Reference: ILCOR Guidelines 2015

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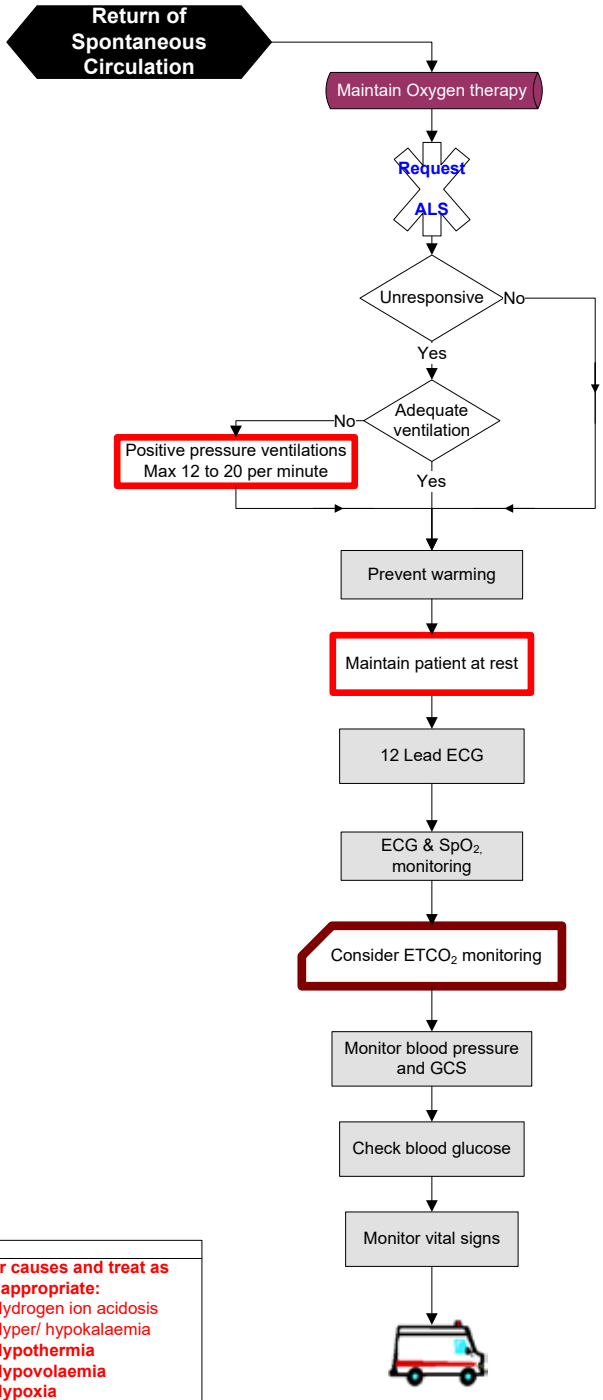
Version 3, 03/2016

Post-Resuscitation Care – Paediatric (≤ 15 years)

P AP



Titrate O_2 to 96% - 98%

Initiate mobilisation of 3 to 4 practitioners / responders

Consider causes and treat as appropriate:

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

If persistent poor perfusion or < 5th percentile Sys BP consider

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

5th percentile systolic BP = 70 mmHg + (2 x age)

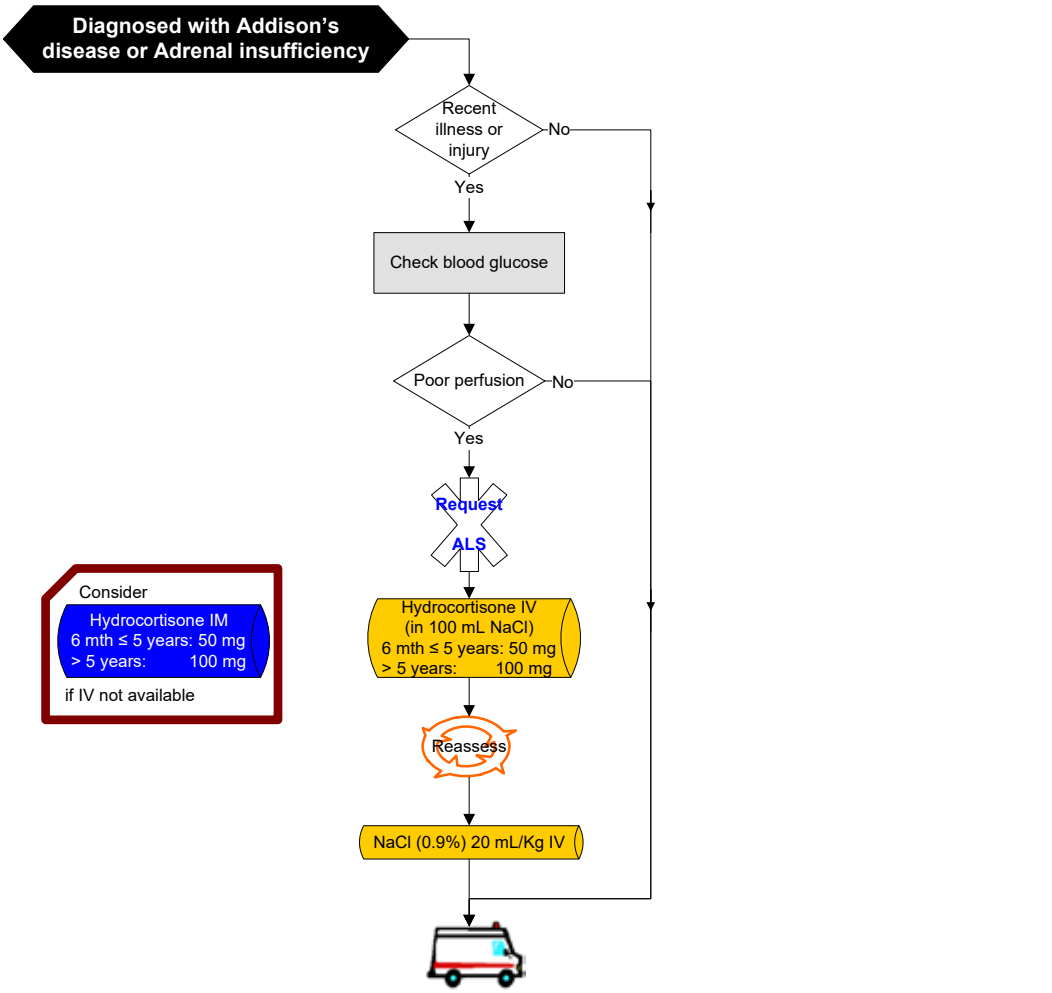
Reference: ILCOR Guidelines 2015

Pre-Hospital Emergency Care Council

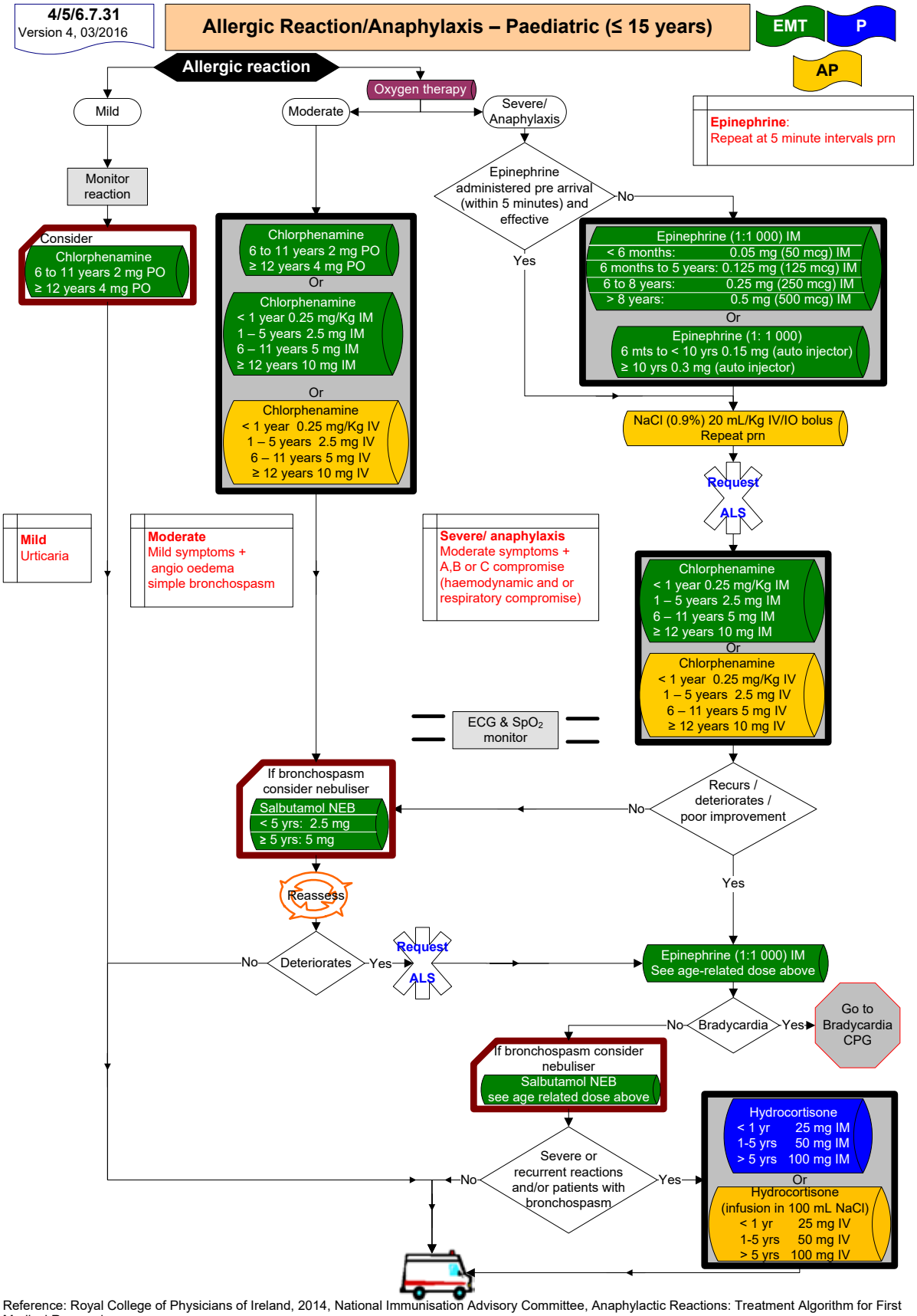
5/6.7.30
Version 1, 12/2013

Adrenal Insufficiency – Paediatric (≤ 15 years)

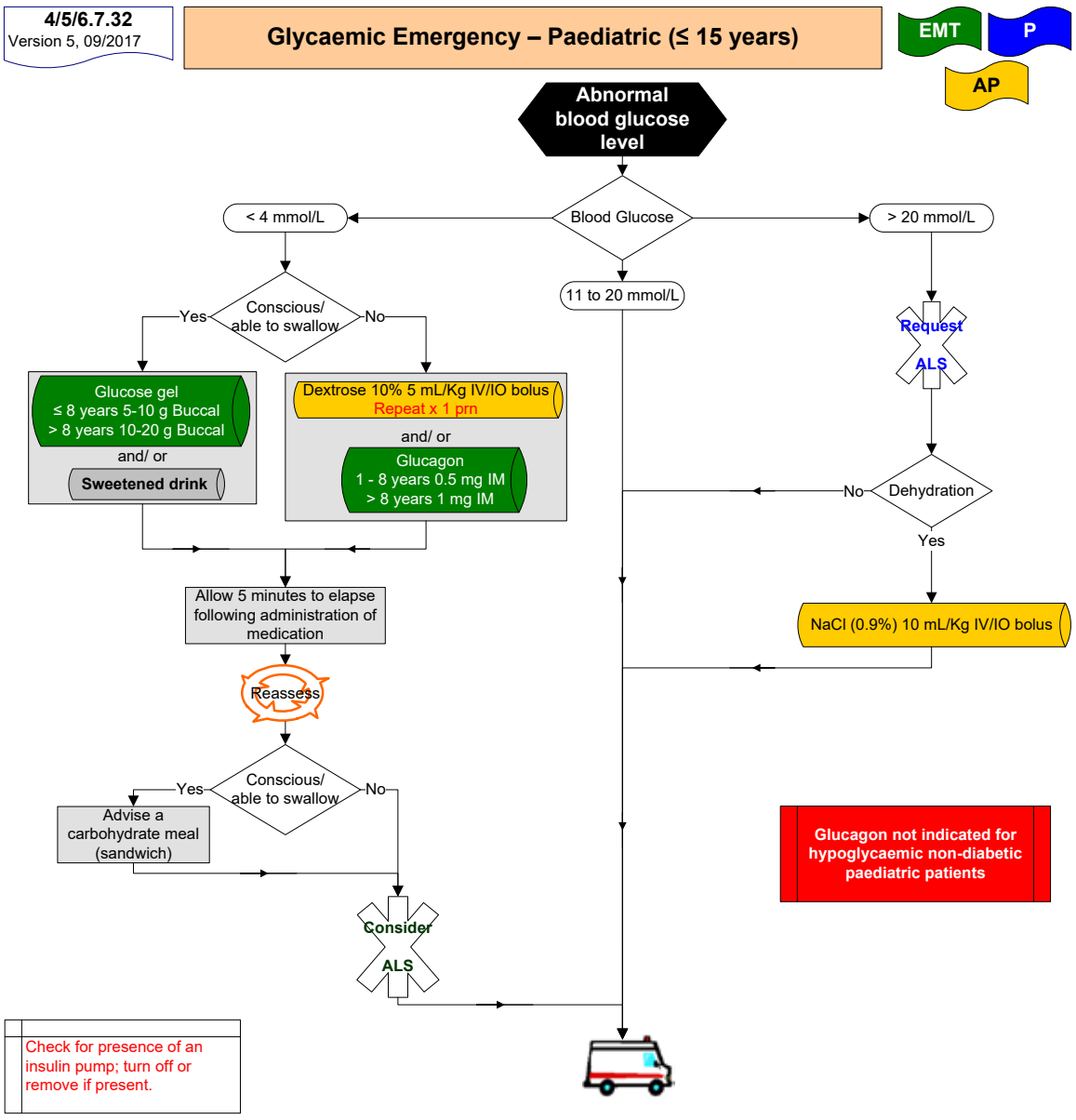
P AP



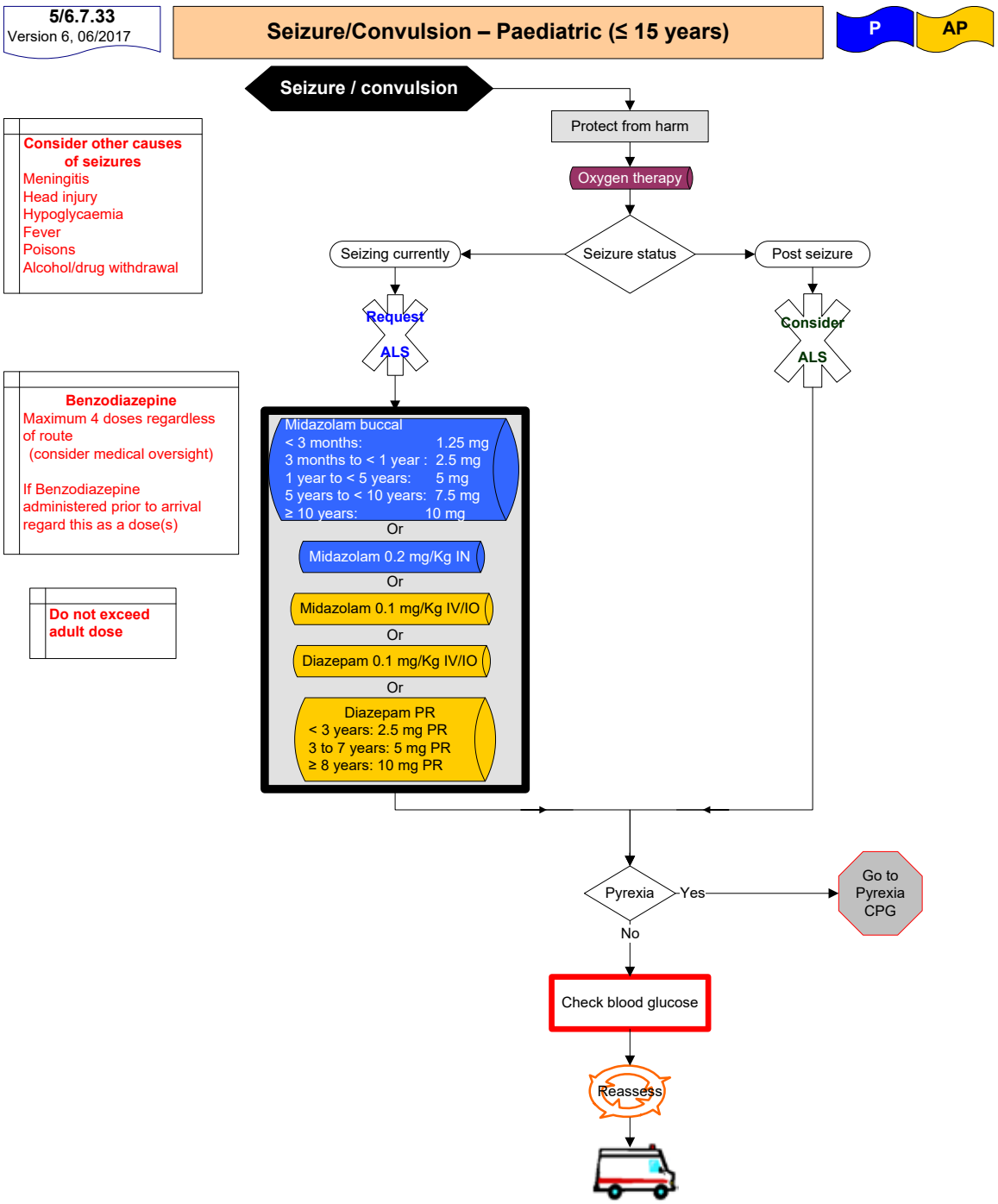
Reference: Antal, Z. and P. Zhou (2009). "Addison disease." Pediatr Rev **30**(12): 491-493



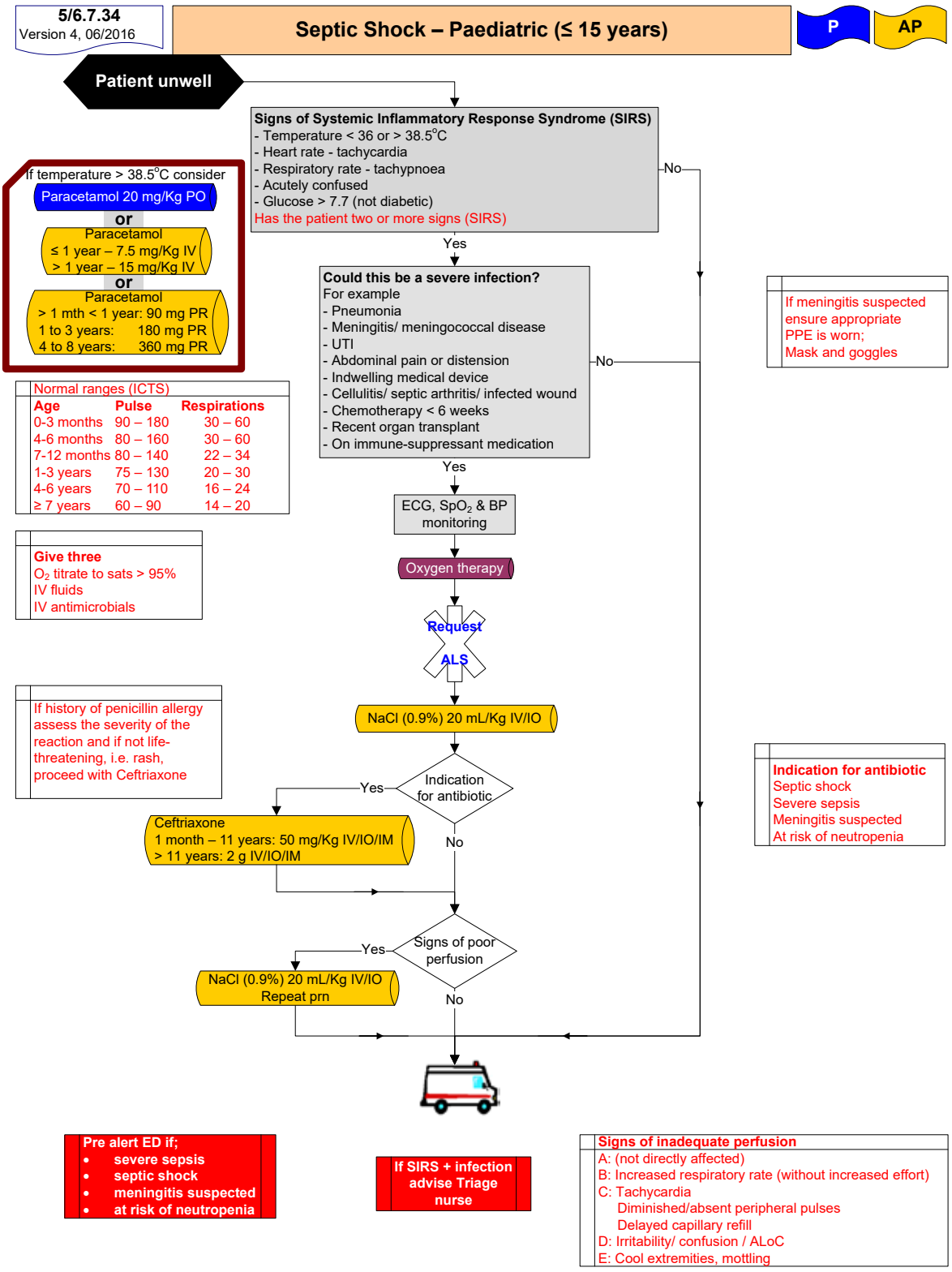
Reference: Royal College of Physicians of Ireland, 2014, National Immunisation Advisory Committee, Anaphylactic Reactions: Treatment Algorithm for First Medical Responders.



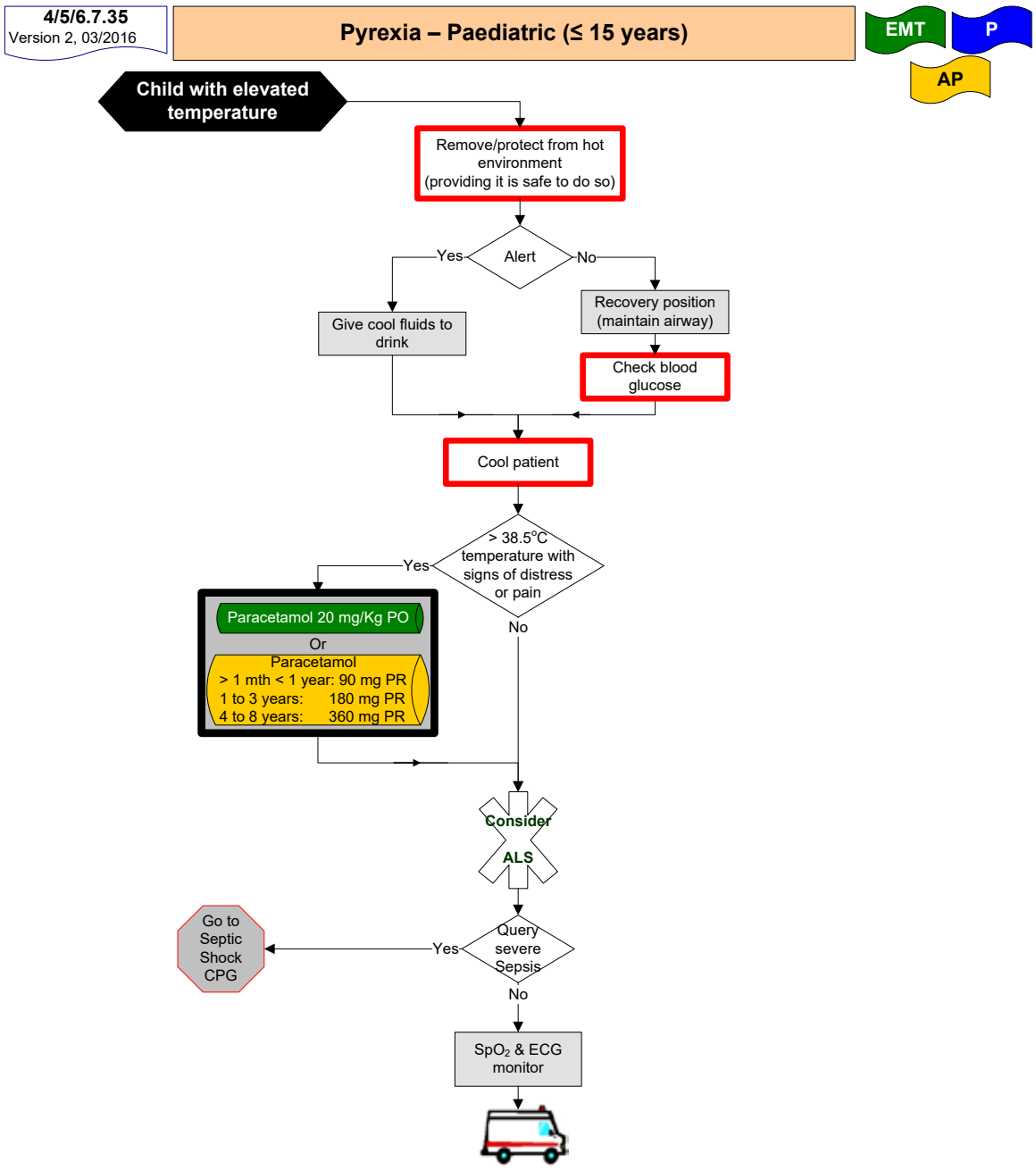
Reference: Dehydration- Paramedic Textbook 2nd E p 1229



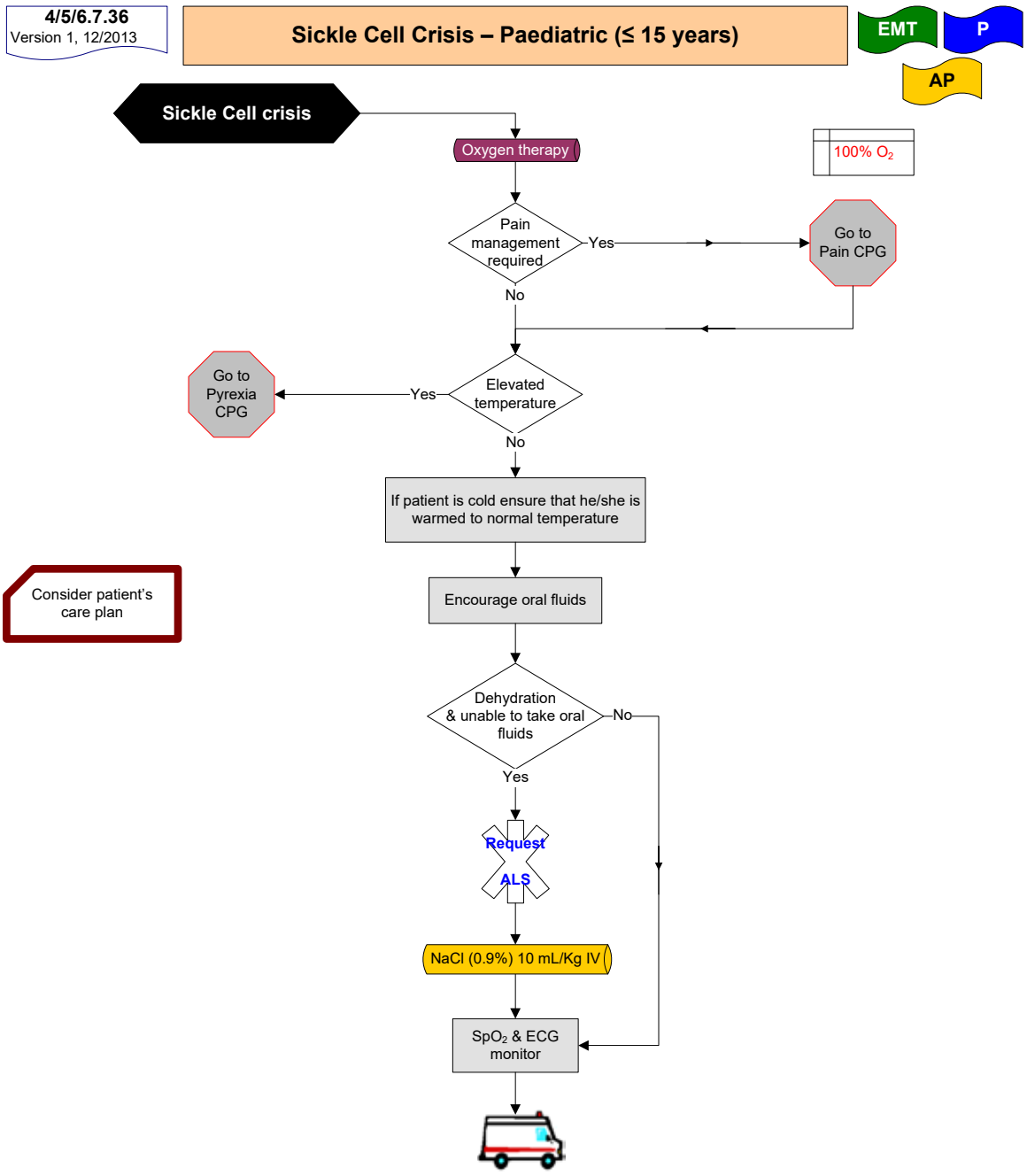
Reference: Appleton, R., et al. (2008). "Drug management for acute tonic-clonic convulsions including convulsive status epilepticus in children." Cochrane Database Syst Rev(3): CD001905



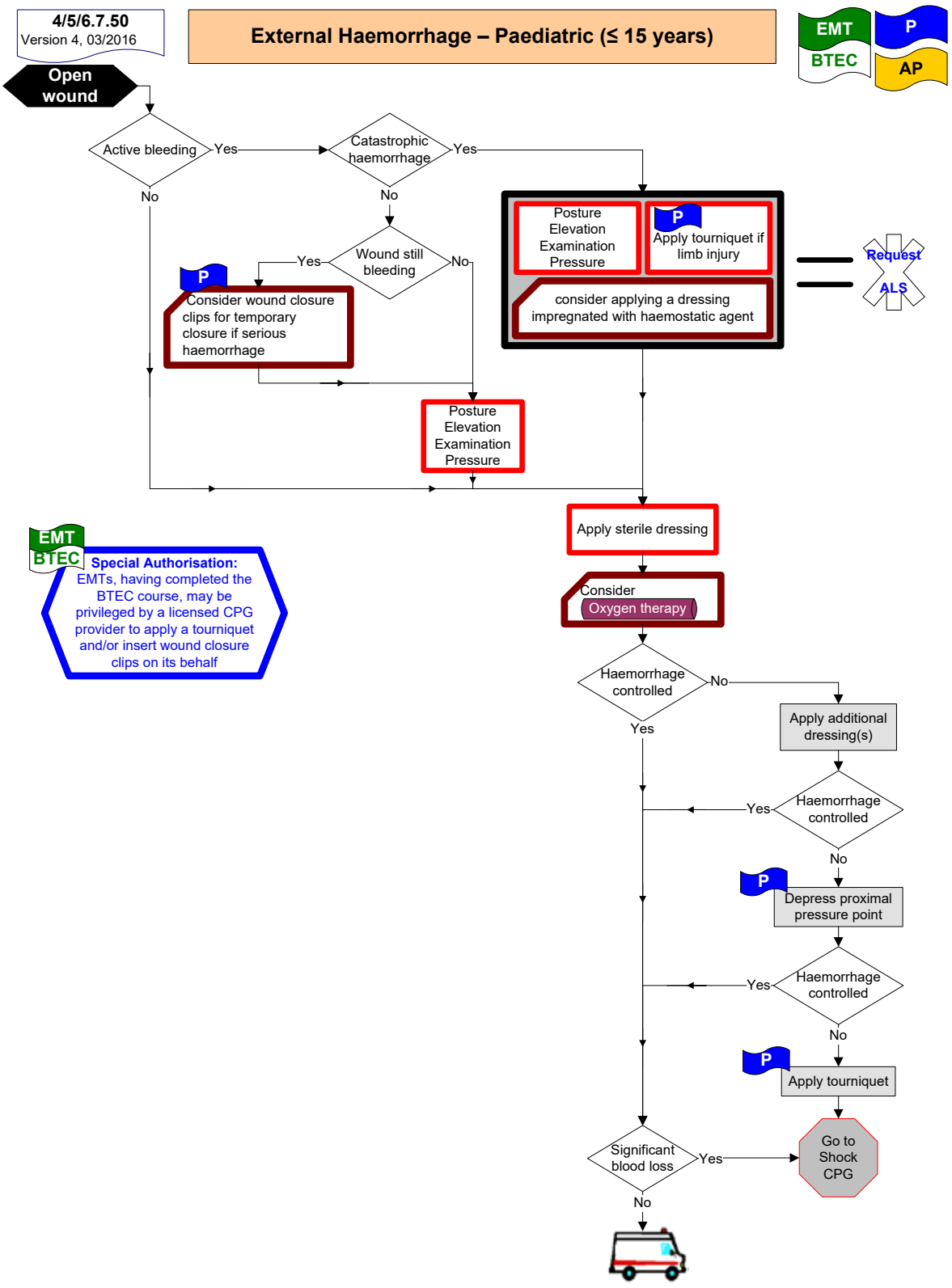
Reference: National Clinical Guideline No. 12: The Irish Paediatric Early Warning System (PEWS), National Clinical Effectiveness Committee, Department of Health, November, 2015
RFDS, 2013, Primary Clinical Care Manual 8th Edition



Reference: ILCOR Guidelines 2015
RFDS, 2013, Primary Clinical Care Manual 8th Edition



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

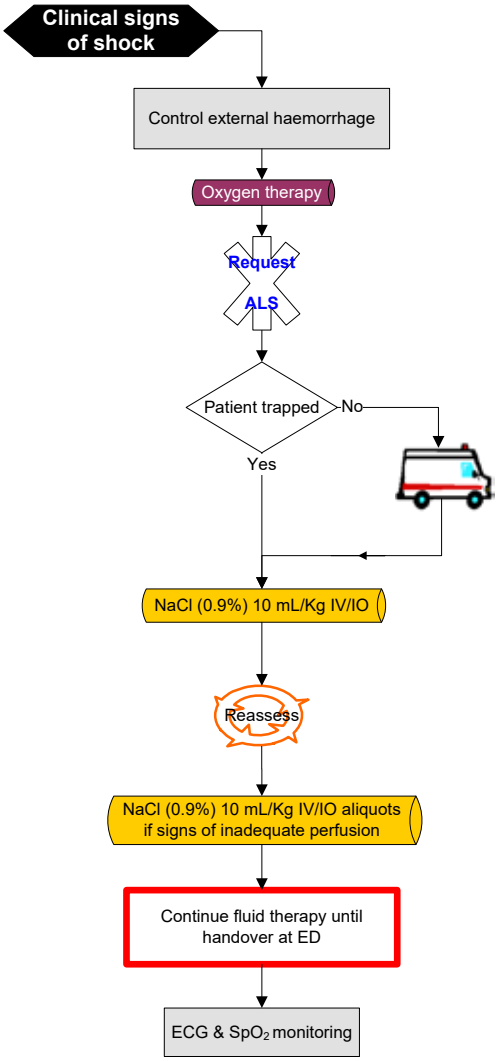


Reference: ILCOR Guidelines 2015
Granville-Chapman J, et al. Pre-hospital haemostatic dressings: A systematic review. Injury (2010), doi: 10.1016/j. injury. 2010.09.037

5/6.7.51
Version 3, 12/2013

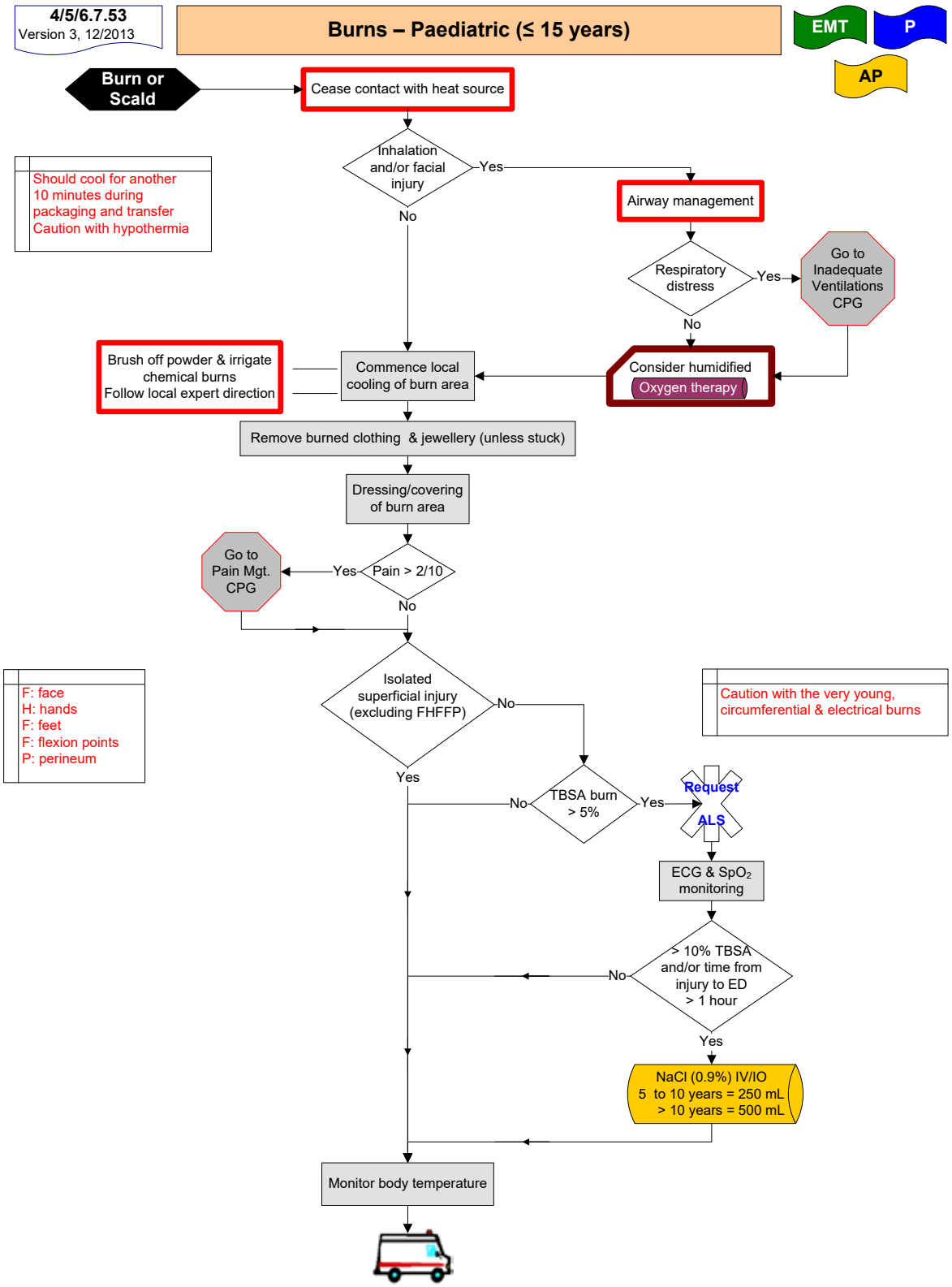
Shock from Blood Loss – Paediatric (≤ 15 years)

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 Prefessionals, Jones and Bartlett.



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 2nd Edition, Mosby

4/5/6.8.1
Version 2, 01/2013

Major Emergency (Major Incident) – First Practitioners on site

EMT P AP

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

Possible Major Emergency

Take standard infection control precautions

Consider pre-arrival information

PPE (high visibility jacket and helmet) must be worn

Practitioner 1

Park at the scene as safety permits and in conjunction with Fire & Garda if present

Leave blue lights on as vehicle acts as Forward Control Point pending the arrival of the Mobile Control Vehicle

Confirm arrival at scene with Ambulance Control and provide an initial visual report stating Major Emergency (Major Incident) Standby or Declared

Maintain communication with Practitioner 2

Leave the ignition keys in place and remain with vehicle

Carry out Communications Officer role until relieved

Practitioner 2 (Ideally MIMMS trained)

Carry out scene survey

Give situation report to Ambulance Control using METHANE message

Carry out HSE Controller of Operations (Ambulance Incident Officer) role until relieved

Liaise with Garda Controller of Operations (Police Incident Officer) and Local Authority Controller of Operations (Fire Incident Officer)

Select location for Holding Area (Ambulance Parking Point)

Set up key areas in conjunction with other Principal Response Agencies on site;
- Site Control Point (Ambulance Control Point),
- Casualty Clearing Station
- Ambulance loading point
- On site co-ordination centre

If single Practitioner is first on site combine both roles until additional Practitioners arrive

METHANE message
M – Major Emergency declaration / standby
E – Exact location of the emergency
T – Type of incident (transport, chemical etc.)
H – Hazards present and potential
A – Access / egress routes
N – Number of casualties (injured or dead)
E – Emergency services present and required

The first ambulance crew does not provide care or transport of patients as this interferes with their ability to liaise with other services, to assess the scene and to provide continuous information as the incident develops

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)

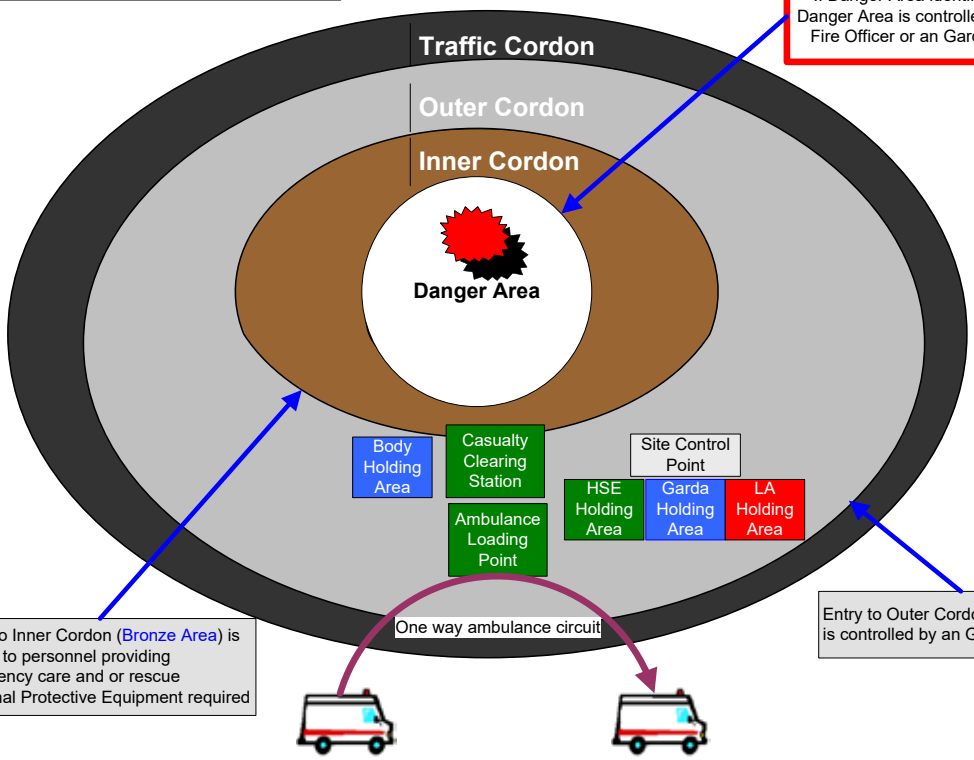
4/5/6.8.2
Version 2, 01/2013

Major Emergency (Major Incident) – Operational Control

EMT P AP

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

If Danger Area identified, entry to Danger Area is controlled by a Senior Fire Officer or an Garda Síochána



Entry to Inner Cordon (Bronze Area) is limited to personnel providing emergency care and or rescue Personal Protective Equipment required

Entry to Outer Cordon (Silver area) is controlled by an Garda Síochána

Management structure for;
Outer Cordon, Tactical Area (Silver Area)
On-Site Co-ordinator
HSE Controller of Operations (Ambulance Incident Officer)
Site Medical Officer (Medical Incident Officer)
Local Authority Controller of Operations (Fire Incident Officer)
Garda Controller of Operations (Police Incident Officer)

Management structure for;
Inner Cordon, Operational Area (Bronze Area)
Forward Ambulance Incident Officer (Forward Ambulance Incident Officer)
Forward Medical Incident Officer (Forward Medical Incident Officer)
Fire Service Incident Commander (Forward Fire Incident Officer)
Garda Cordon Control Officer (Forward Police Incident Officer)

Please note that Controller of Operations may be other than ambulance or fire officers, depending on the nature of the emergency

Other management functions for;
Major Emergency site
Casualty Clearing Officer
Triage Officer
Ambulance Parking Point Officer
Ambulance Loading Point Officer
Communications Officer
Safety Officer

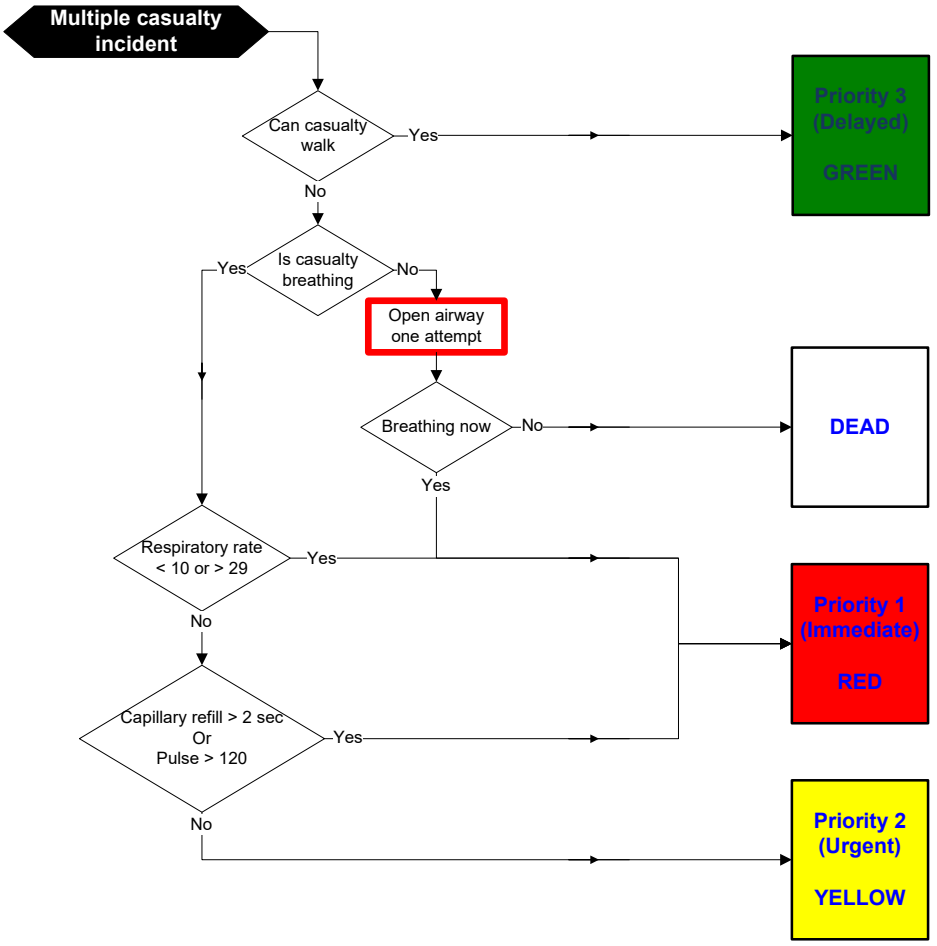
The principles and terminology of Major Incident Medical Management and Support (MIMMS) has been used with the kind permission of the Advanced Life Support Group, UK

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

4/5/6.8.3
Version 1, 05/2008

Triage Sieve

EMT P AP



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

5/6.8.4
Version 1, 05/2008

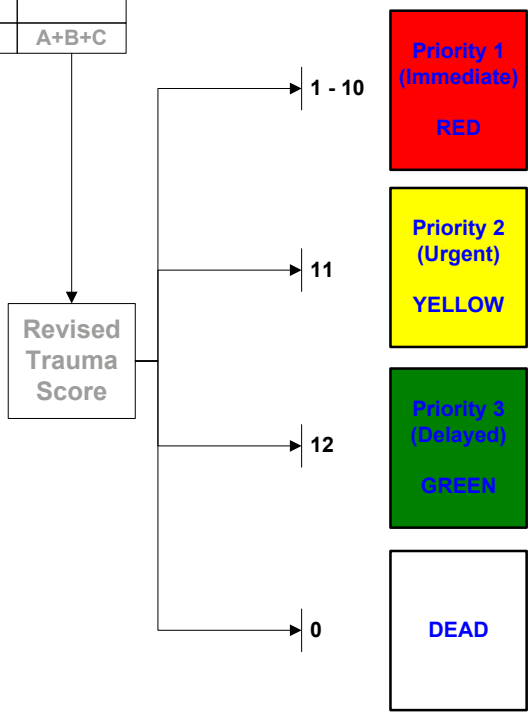
Triage Sort

P AP

Multiple casualty incident

Triage is a dynamic process

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



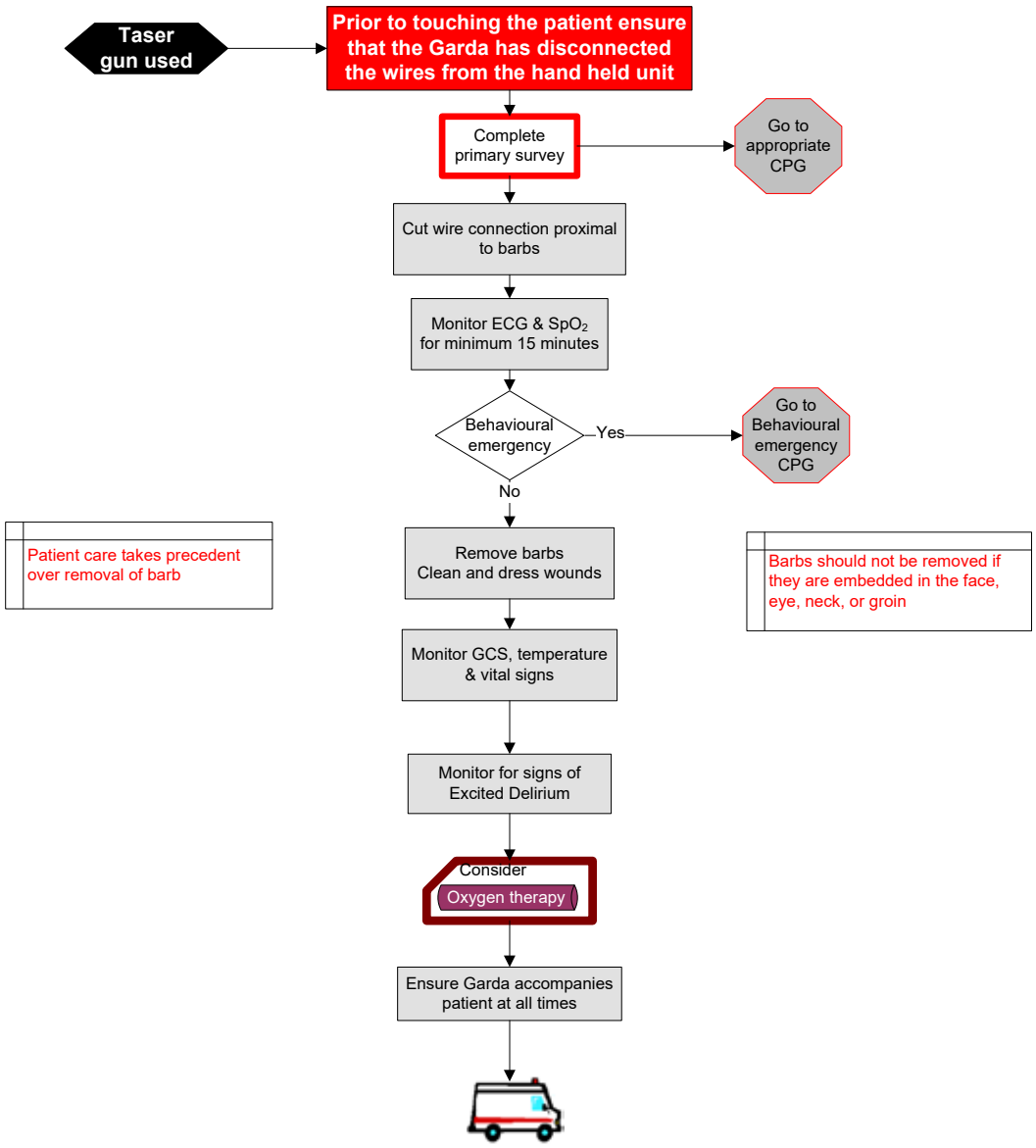
Eye Opening	Spontaneous To Voice To Pain None	4 3 2 1
Verbal Response	Oriented Confused Inappropriate words Incomprehensible sounds None	5 4 3 2 1
Motor Response	Obeys commands Localises pain Withdraw (pain) Flexion (pain) Extension (pain) None	6 5 4 3 2 1
Glasgow Coma Scale		

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

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

4/5/6.8.6
Version 1, 03/2016

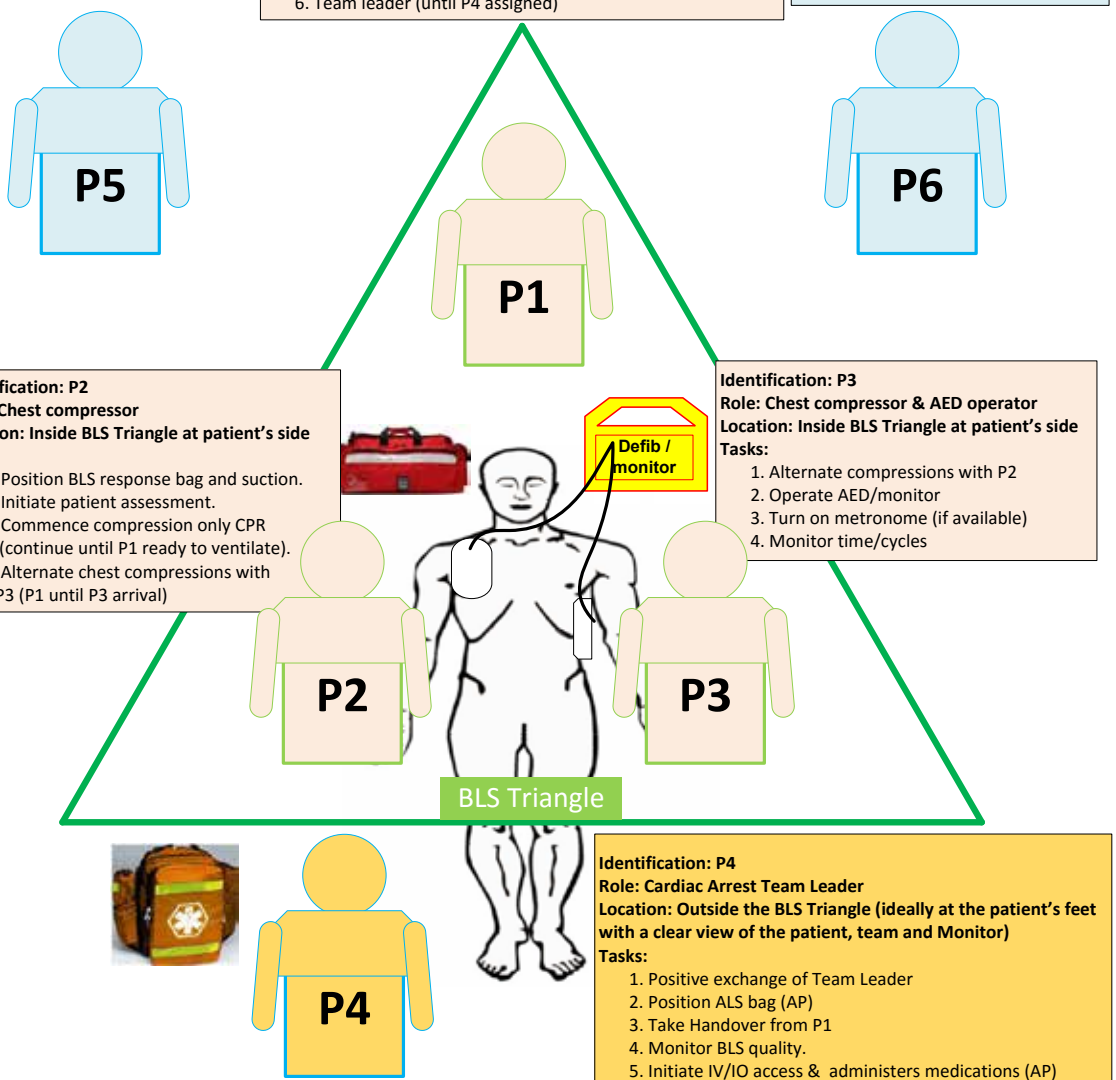
Team Resuscitation

EMT P AP

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 $ETCO_2$ 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)

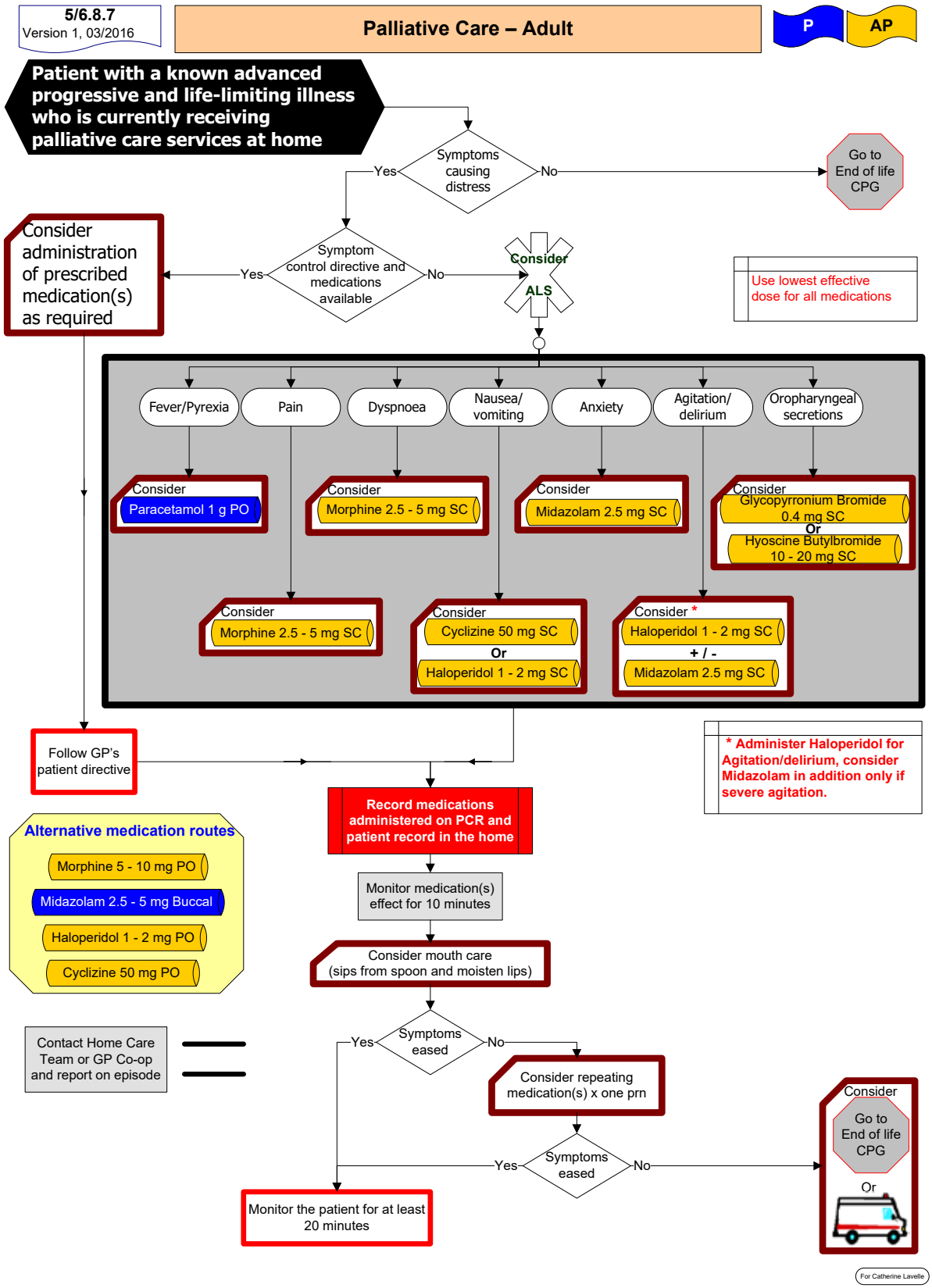
Identification: P3
Role: Chest compressor & AED operator
Location: Inside BLS Triangle at patient's side
Tasks:
1. Alternate compressions with P2
2. Operate AED/monitor
3. Turn on metronome (if available)
4. Monitor time/cycles

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. Positive 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.

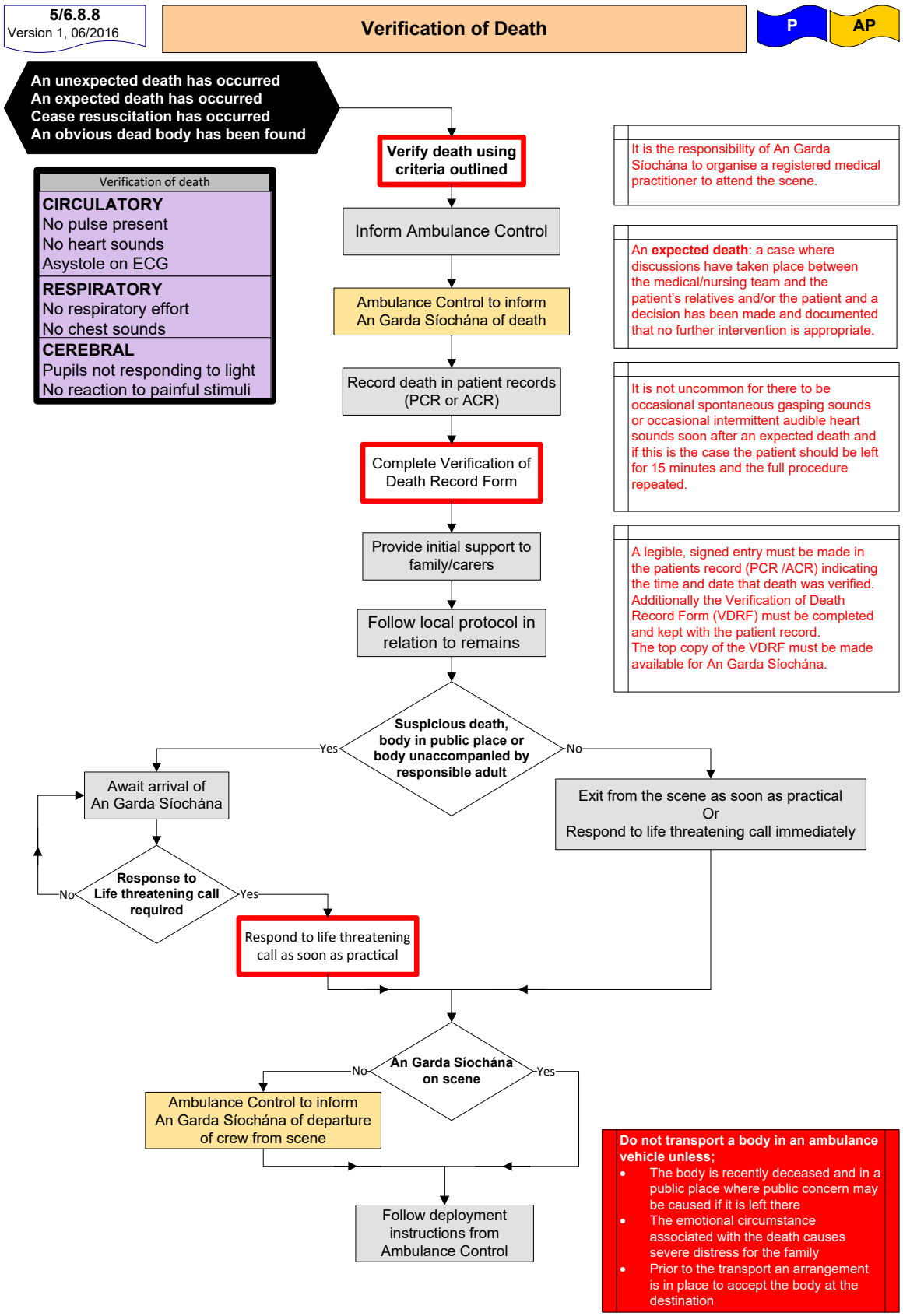
Positions and roles are as laid out, however a practitioner may change position thus taking on the role of that position.

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

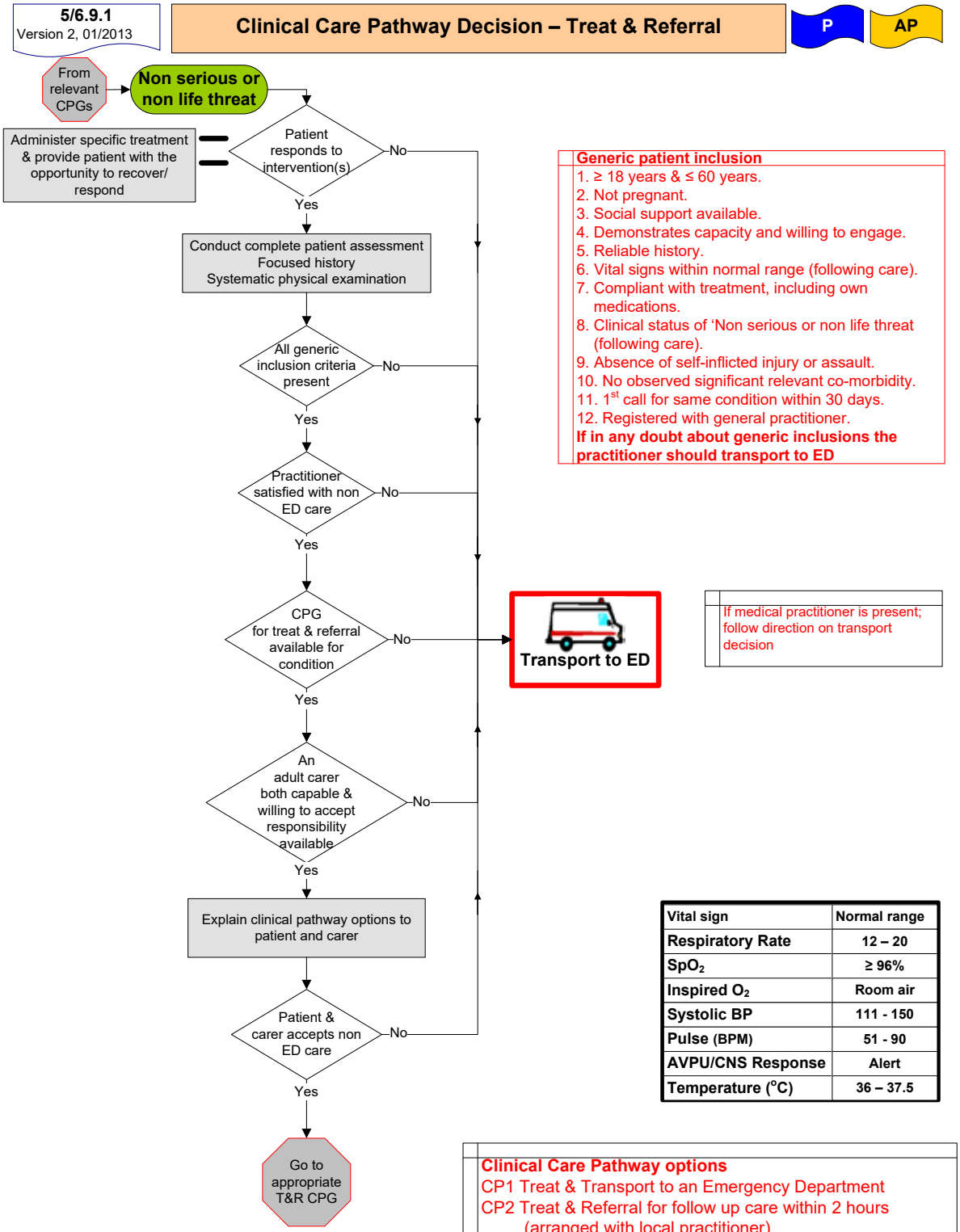
Reference: ILCOR Guidelines 2015



Reference: STN023 Palliative Care by PHECC registered practitioners



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



Generic patient inclusion

1. ≥ 18 years & ≤ 60 years.
2. Not pregnant.
3. Social support available.
4. Demonstrates capacity and willing to engage.
5. Reliable history.
6. Vital signs within normal range (following care).
7. Compliant with treatment, including own medications.
8. Clinical status of 'Non serious or non life threat (following care).
9. Absence of self-inflicted injury or assault.
10. No observed significant relevant co-morbidity.
11. 1st call for same condition within 30 days.
12. Registered with general practitioner.

If in any doubt about generic inclusions the practitioner should transport to ED

If medical practitioner is present; follow direction on transport decision

Vital sign	Normal range
Respiratory Rate	12 – 20
SpO_2	≥ 96%
Inspired O_2	Room air
Systolic BP	111 - 150
Pulse (BPM)	51 - 90
AVPU/CNS Response	Alert
Temperature (°C)	36 – 37.5

Clinical Care Pathway options

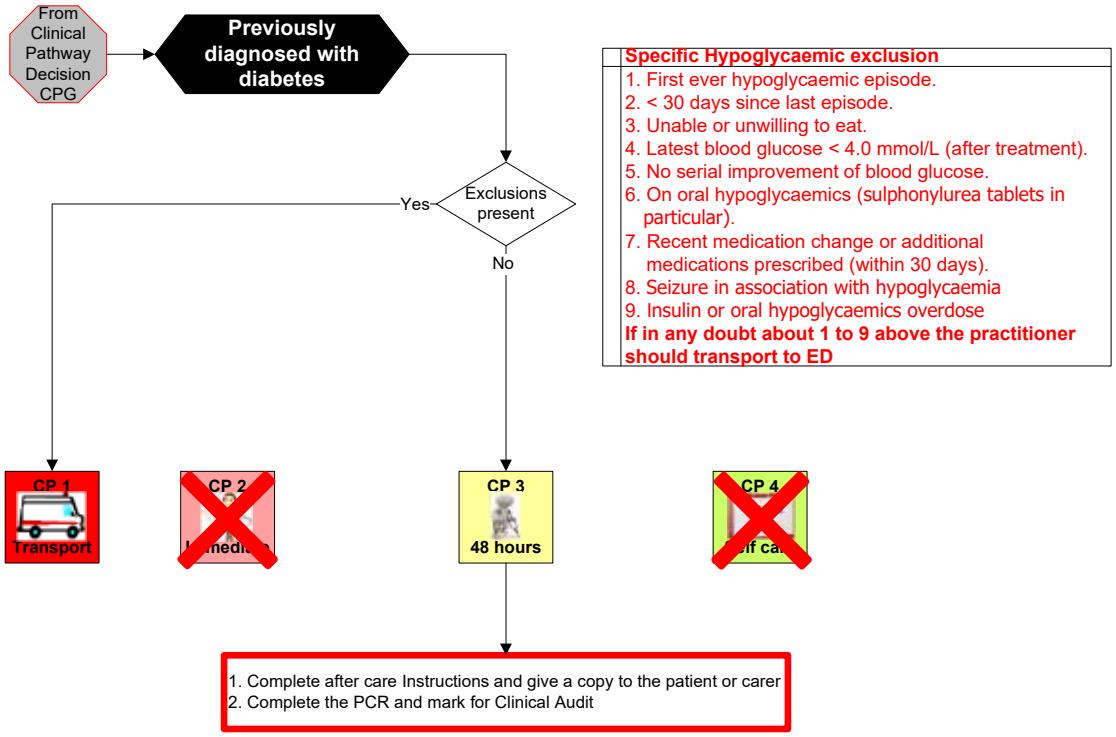
CP1 Treat & Transport to an Emergency Department
CP2 Treat & Referral for follow up care within 2 hours (arranged with local practitioner)
CP3 Treat & Referral for follow up care within 48 hours or as soon as practicable
CP4 Treat & Referral to self care with after care instructions

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

5/6.9.2
Version 2, 01/2013

Hypoglycaemia – Treat & Referral

P AP



Specific Hypoglycaemic exclusion

1. First ever hypoglycaemic episode.
2. < 30 days since last episode.
3. Unable or unwilling to eat.
4. Latest blood glucose < 4.0 mmol/L (after treatment).
5. No serial improvement of blood glucose.
6. On oral hypoglycaemics (sulphonylurea tablets in particular).
7. Recent medication change or additional medications prescribed (within 30 days).
8. Seizure in association with hypoglycaemia
9. Insulin or oral hypoglycaemics overdose

If in any doubt about 1 to 9 above the practitioner should transport to ED

Ensure patient takes in both quick (lucozade, fruit juice or sweets) and longer acting (bread, toast, biscuit) carbohydrates

Flush line with 10 mL NaCl following removal of 10% Dextrose infusion

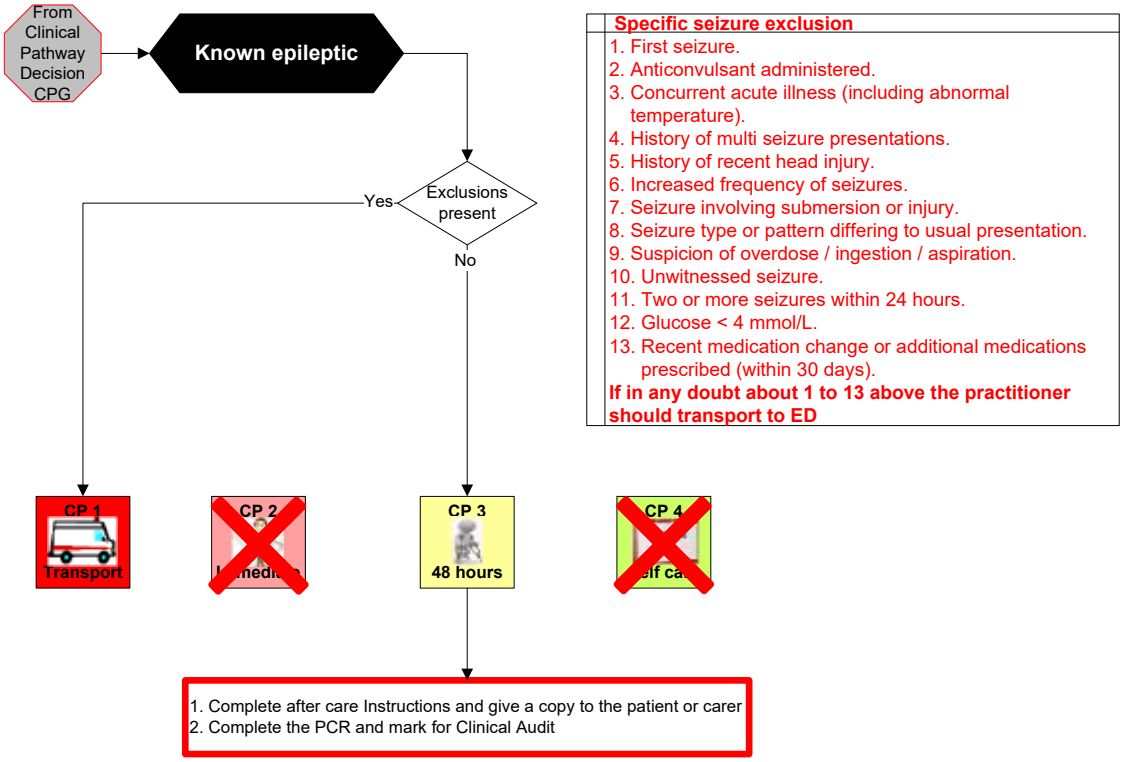
If the patient expresses a wish to attend an Emergency Department then arrangements shall be made to transport him/her there

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

5/6.9.3
Version 2, 01/2013

Isolated seizure – Treat & Referral

P AP



Specific seizure exclusion

1. First seizure.
2. Anticonvulsant administered.
3. Concurrent acute illness (including abnormal temperature).
4. History of multi seizure presentations.
5. History of recent head injury.
6. Increased frequency of seizures.
7. Seizure involving submersion or injury.
8. Seizure type or pattern differing to usual presentation.
9. Suspicion of overdose / ingestion / aspiration.
10. Unwitnessed seizure.
11. Two or more seizures within 24 hours.
12. Glucose < 4 mmol/L.
13. Recent medication change or additional medications prescribed (within 30 days).

If in any doubt about 1 to 13 above the practitioner should transport to ED

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

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 ≤ 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 =	(age x 2) + 8 Kg
Greater than 5 years =	(age x 3) + 7 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 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

Changes in blue text relate to the 2018 updates.

Adenosine		
Heading	**Add**	**Delete**
Contra-indications	Wolff-Parkinson-White syndrome	

Amiodarone		
Heading	**Add**	**Delete**
Presentation	300 mg (30 mg/mL)	10 mL (30 mg/mL)
Administration		**CPG:** 5/6.4.7
Indications	(pVT)	(VT)
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_5W, 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	

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Atropine		
Heading	**Add**	**Delete**
Administration	**CPG:** 5/6.4.21	**CPG:** 5/6.4.7
Indications	(from Organophosphorous insecticides)	
Additional Information	Do not administer Atropine if temperature < 34°C	

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 **Palliative Care:** 50 mg PO/SC (Repeat x 1 prn) (**AP**) **Paramedic:** Administer IM route	

Ceftriaxone		
Heading	**Add**	**Delete**
Administration	Reconstitute each 1 g vial with 3.5 mL of 1% Lidocaine Hydrochloride injection	Reconstitute each 1 g vial with 2 mL of 1% Lidocaine Hydrochloride injection
Additional Information	(reconstitute in 2 mL and add 8 mL water for injection). Intramuscular route may be used only in exceptional circumstances. Up to 1 g (3.5 mL) divide into more than one injection site. IM injection should be mixed as 1 g and 3.5 mL of 1% Lidocaine Hydrochloride injection to reduce pain at the IM injection site	IM injection may be mixed with 2 mL of 1% Lidocaine Hydrochloride injection to reduce pain at the IM injection site.

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**
Presentation		(for EMT use)
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	**Paediatric:** **Stridor (AP):** < 1 Year: 2.5 mg NEB / ≥ 1 year: 5 mg NEB (repeat after 30 minutes prn) (AP) **Adult:** 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
Contra-indications	< 1 year	
Usual dosages	1 - 8 years - 0.5 mg (500 mcg) IM.	≤ 8 years - 0.5 mg (500 mcg) IM
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

APPENDIX 1 - Medication Formulary

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

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	**Adult:** **Anaphylactic reaction:** (AP) 200 mg IV (infusion in 100 mL NaCl) or IM injection (P & AP) **Exacerbation of COPD:** 200 mg IV (infusion in 100 mL NaCl) or IM (AP) **Asthma:** 100 mg slow IV (infusion in 100 mL NaCl) (AP) **Adrenal insufficiency:** (AP) 100 mg IV (infusion in 100 mL NaCl) or IM (P & AP) **Paediatric:** **Anaphylactic reaction:** < 1 year: (AP) - 25 mg IV (infusion in 100 mL NaCl) or IM injection (P & AP) 1 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) **Asthma:** (AP) < 1 year: 25 mg / 1 to 5 years: 50 mg / > 5 years: 100 mg IV - (infusion in 100 mL NaCl) **Adrenal insufficiency:** 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)	**Asthma (AP) and Adrenal insufficiency (P & AP):** 100 mg IV (infusion in 100 mL NaCl) or IM **6 mths to ≤ 5 yrs:** 50 mg IV (infusion in 100 mL NaCl) or IM **> 5 years:** 100 mg IV (infusion in 100 mL NaCl) or IM
Additional Information	If the patient, in an adrenal crisis, is still unwell following Hydrocortisone administration prior to arrival of the practitioner the standard dose of Hydrocortisone should be administered.	

APPENDIX 1 - Medication Formulary

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) **Paediatric:** 10 mg/Kg PO to a maximum of 400 mg.	
Additional Information	Caution if on oral anticoagulant (e.g. Warfarin, Rivaroxaban, Apixaban, Edoxaban) due to increased bleeding risk	

Ketamine		
Heading	**Add**	**Delete**
Presentation	Vial	Ampoule (draw up 1 mL and dilute in 9 mL of NaCl)

Lidocaine		
Heading	**Add**	**Delete**
Presentation	5 mg/ 5 mL 1%	
Administration	(**CPG:** 4/5/6.7.22)	
Indications	VF/pVT Solvent for Ceftriaxone IM	VF/VT
Usual Dosages	**Adult:** 100 mg IV Solvent 3.5 mL for Ceftriaxone IM **Paediatric:** 1-1.5 mg/Kg IV Solvent 3.5 mL for Ceftriaxone IM	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	
Additional Information	Must seek medical advice prior to administration	

APPENDIX 1 - Medication Formulary

Magnesium Sulphate Injection		
Heading	**Add**	**Delete**
Indications	Life-threatening Asthma	
Administration		**CPG:** 4/5/6.4.3
Usual Dosages	**Life-threatening Asthma:** 2 g IV (infusion in 100 mL NaCl) given over 20 minutes **Infusion times added for the following:** 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	

Methoxyflurane		
Heading	**Add**	**Delete**
Contra-Indications	Renal Failure or Impairment	
Additional Information		Do not use in patients with renal impairment or renal failure.

Midazolam Solution		
Heading	**Add**	**Delete**
Administration	(**CPG:** 5/6.8.7, 4/5/6.4.30)	
Indications	Sedation (following medical advice)	
Usual Dosages	**Palliative Care:** 2.5 mg SC (AP) Alternatively 2.5 - 5 mg buccal (P & AP) repeat x 1 prn Maximum 4 doses of Benzodiazepine for adult and paediatric seizing patients regardless of route. Repeat at no < 5 minutes prn. **Behavioural Emergency:** AP - Seek medical advice regarding sedation **Adults:** 5 mg IN/IM - (Repeat x 2 prn) (AP) **Paediatric:** 0.1 mg/Kg IN - (Repeat x 2 prn) (AP) Seizure < 3 months: - 1.25 mg buccal 3 months to < 1 year: - 2.5 mg buccal	Repeat x 1 prn Seizure: < 1 year: - 2.5 mg buccal
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

APPENDIX 1 - Medication Formulary

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

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

Nifedipine		
Heading	**Add**	**Delete**
Presentation	10 mg tablet (standard preparation).	20 mg tablet
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 4 mg IM (P/AP) or slow IV (AP).	4 mg slow IV or IM (AP/P)
Side effects	Injection site reactions (rash, urticaria, itching) **Uncommon:** 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	

APPENDIX 1 - Medication Formulary

Oxygen		
Heading	**Add**	**Delete**
Administration	CPAP device	
Indications	SpO_2 < 90% for patients with acute onset of Pulmonary Oedema	
Usual Dosages	Neonatal Resuscitation (< 4 weeks) Consider supplemental O_2 (≤ 30%)	

Oxytocin		
Heading	**Add**	**Delete**
Usual Dosages	Paediatric: 5 international units IM.	Paediatric: Not indicated.

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	**Adult:** Pyrexia / Temperature > 38.3°C / Minor to moderate pain for adult patients **Paediatric:** 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 (administered slowly over 15 minutes) **Palliative Care:** 1 g PO (Repeat x 1 prn) **Paediatric: IV Infusion** (AP) < 1 year – 7.5 mg/Kg IV (slowly) ≥ 1 year – 15 mg/Kg IV (slowly)	
Side effects	If Paracetamol IV is administered too fast it may result in hypotension.	None
Additional information	Caution with IV Paracetamol in the absence of a buretrol.	

APPENDIX 1 - Medication Formulary

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) Repeat NEB at 5 minute intervals prn **EFR:** assist patient with Asthma/Anaphylaxis 0.1 mg metered aerosol spray (repeat aerosol x 11 prn) **Paediatric:** < 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) Repeat NEB at 5 minute intervals prn **EFR:** 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) **EFRs:** (0.1 mg metered aerosol spray x 2) **Paediatric:** < 5 yrs - (0.1 mg metered aerosol spray x 3) > 5 yrs - (0.1 mg metered aerosol spray x 5)

Sodium Chloride 0.9% (NaCl)		
Heading	**Add**	**Delete**
Usual Dosages	**Asystole / PEA** - Consider fluid challenge 1 L IV/IO (repeat prn) **Suspension Trauma** - 2 L IV (Maintain systolic BP > 90 mmHg) **Tachycardia** - (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

Index of medication formulary (Adult ≥ 16 and Paediatric ≤ 15 unless otherwise stated)

APPENDIX 1 - Medication Formulary

Clinical level: AP

Medication	Adenosine
Class	Antiarrhythmic agent.
Descriptions	Antiarrhythmic agent used to treat supraventricular tachycardia.
Presentation	6 mg in 2 mL solution. 3 mg per 1 mL (30 mg/10 mL) solution for infusion vials.
Administration	Intravenous (IV). (***CPG:*** 5/6.4.12).
Indications	Paroxysmal supraventricular tachycardia (> 150) with signs of poor perfusion.
Contra-Indications	Asthma / Wolff-Parkinson-White syndrome / Chronic obstructive lung disease / Decompensated heart failure / Long QT syndrome / Second or third degree AV block / Severe hypotension / Sick sinus syndrome (unless pacemaker fitted) / KSAR.
Usual Dosages	***Adult:*** 6 mg IV. ***Initial Adenosine unsuccessful:*** Repeat at 12 mg x 2 prn Max. ***Paediatric:*** Not indicated.
Pharmacology / Action	***Antiarrhythmic*** Rapid reversion to sinus rhythm of paroxysmal supraventricular tachycardia.
Side effects	Angina (discontinue). Apprehension - arrhythmia (discontinue if asystole or severe bradycardia occur). AV block / Dizziness / Dyspnoea / Flushing / Headache / Nausea / Sinus pause. ***Uncommon:*** Blurred vision / Hyperventilation / Metallic taste / Palpitation / Sweating / Weakness.
Additional information	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. ***Cautions:*** 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.

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). (***CPG:*** 4/5/6.4.3, 5/6.4.12, 4/5/6.7.22)**.**
Indications	Ventricular Fibrillation (VF) and Pulseless Ventricular Tachycardia (pVT). Symptomatic Tachycardia (> 150).
Contra-Indications	Known hypersensitivity to Iodine / KSAR.
Usual Dosages	***Adult:*** ***VF/pVT:*** 5 mg/Kg IV/IO. ***Loading dose for cardiac arrest:*** 300 mg and one supplemental dose of 150 mg. ***Symptomatic tachycardia:*** 150 mg - IV infusion in 100 mL D_5W (over 10 minutes). ***Paediatric:*** ***VF/pVT:*** 5 mg/Kg IV/IO. If refractory ***VF/pVT*** post Epinephrine and 3rd shock
Pharmacology / Action	***Antiarrhythmic:*** 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_5W). 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_5W, making the concentration 150 mg in 5 mL.

APPENDIX 1 - Medication Formulary

Clinical level: 

Medication	Aspirin
Class	Platelet aggregation inhibitor.
Descriptions	Anti-inflammatory agent and an inhibitor of platelet function. Useful agent in the treatment of various thromboembolic diseases such as acute myocardial infarction.
Presentation	300 mg dispersible tablet.
Administration	Orally (PO) - dispersed in water, or to be chewed - if not dispersible form. (***CPG:*** 5/6.4.10, 4.4.10, 1/2/3.4.10).
Indications	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).
Contra-Indications	Active symptomatic gastrointestinal (GI) ulcer / Bleeding disorder (e.g. haemophilia) / Known severe adverse reaction / Patients < 16 years old (risk of Reye's syndrome) .
Usual Dosages	***Adult:*** 300 mg tablet. ***Paediatric:*** Contraindicated.
Pharmacology / Action	***Antithrombotic:*** Inhibits the formation of thromboxane A2, which stimulates platelet aggregation and artery constriction. This reduces clot/thrombus formation in an MI.
Side effects	Epigastric pain and discomfort / Bronchospasm / Gastrointestinal haemorrhage / Increased bleeding time / Skin reactions in hypersensitive patients.
Long term effects	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.
Additional information	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: AP

Medication	Atropine
Class	Anticholinergic (parasympatholytic).
Descriptions	Parasympatholytic (Anticholinergic) that is derived from parts of the *Atropa belladonna* plant.
Presentation	Pre-filled disposable syringe 1 mg/10 mL. Ampoule 0.6 mg in 1 mL.
Administration	Intravenous (IV). Intraosseous (IO). (***CPG:*** 5/6.3.5, 4/5/6.4.11, 5/6.4.21, 6.4.22).
Indications	***Adult:*** Symptomatic bradycardia. Cholinergic poison (from Organophosphorus insecticides) with bradycardia and salivation.
Contra-Indications	Known severe adverse reaction / Post-cardiac transplantation.
Usual Dosages	***Adult:*** ***Cholinergic poison with bradycardia and salivation:*** 1 mg IV. (Repeat at 3-5 min intervals to ensure minimal salivary secretions). ***Symptomatic Bradycardia:*** 0.6 mg (600 mcg) IV. (Repeat at 3-5 min intervals to Max 3 mg). ***Paediatric:*** Not indicated.
Pharmacology / Action	***Anticholinergic agent:*** Blocks acetylcholine receptors. Enhances SA node automaticity. Enhance AV node conduction. Increases heart rate.
Side effects	Tachycardia / Dry mouth / Dilated pupils.
Additional information	Accidental exposure to the eye causes blurred vision. Do not administer Atropine if temperature < 34°C

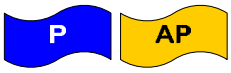
APPENDIX 1 - Medication Formulary

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. ***IV/IO:*** Reconstitute each 1 g vial in 10 mL of water for injection BP. Should be administered over 2-4 minutes. ***Intravenous infusion:*** Reconstitute 2 g of Ceftriaxone in 100 mL of one of the following calcium-free solutions: • Dextrose 5% or 10% • Sodium chloride (NaCl 0.9%) The Infusion should be administered over at least 30 minutes. ***IM:*** Reconstitute each 1g vial with 3.5 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). Ceftriaxone solutions containing Lidocaine should never be administered IV.
Usual Dosages	***Adult:*** 2 g IV/IO/IM. ***Paediatric:*** *1 Month – 11 years: 50 mg/Kg IV/IO/IM* *> 11 years or body weight > 50 Kg: 2 g IV/IO/IM* *IV injection over 2-4 minutes or deep IM Injection.*
Pharmacology / Action	Antibacterial spectrum.
Side effects	Diarrhoea / Rash / Headache / Dizziness / Nausea / Vomiting / Pruritus.
Additional information	Ceftriaxone ***must not*** be mixed or administered simultaneously with any calcium-containing intravenous solutions. Preferred route >1 g by IV infusion. (reconstitute in 2 mL and add 8 mL water for injection). Intramuscular route may be used only in exceptional circumstances. Up to 1 g (3.5 mL) divide into more than one injection site. IM injection should be mixed as 1 g and 3.5 mL of 1% Lidocaine Hydrochloride injection to reduce pain at the IM injection site. The resulting solution should never be administered intravenously.

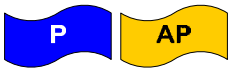
Clinical level: EMT P AP

Medication	Chlorphenamine
Class	Antihistamine
Descriptions	H_1 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	**Adult:** *Allergic reaction* 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). **Paediatric:** *Allergic reaction*: Mild: 6 to 11 years – 2 mg PO (EMT / P / AP). ≥ 12 years – 4 mg PO (EMT / P / AP). Moderate: < 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). Severe / Anaphylaxis: < 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).
Pharmacology / Action	Chlorphenamine is a potent antihistamine (H_1-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%.

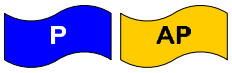
Clinical level: 

Medication	Clopidogrel
Class	Platelet aggregation inhibitor.
Descriptions	An inhibitor of platelet function.
Presentation	300 mg tablet. 75 mg tablet.
Administration	Orally (PO). (***CPG:*** 5/6.4.10).
Indications	ST elevation myocardial infarction (STEMI) if the patient is not for PPCI.
Contra-Indications	Known severe adverse reaction / Active pathological bleeding / Severe liver impairment.
Usual Dosages	***Adult:*** 300 mg PO. *(≥ 75 years*: 75 mg PO). ***Paediatric:*** Not indicated.
Pharmacology / Action	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.
Side effects	Abdominal pain / Dyspepsia / Diarrhoea.
Additional information	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.

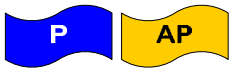
APPENDIX 1 - Medication Formulary

Clinical level: 

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

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. $D_{10}W$ is a hypertonic solution.
Presentation	Soft pack for infusion 250 mL and 500 mL.
Administration	Intravenous (IV) Infusion/bolus. Intraosseous (IO). ***Paramedic:*** 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	***Adult:*** 250 mL IV/IO infusion (repeat x 1 prn). ***Paediatric:*** 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.

Clinical level: 

Medication	DEXTROSE 5% 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_5W is a hypertonic solution and is used as an infusion medium for Amiodarone.
Presentation	Soft pack for infusion 100 mL and 500 mL.
Administration	Intravenous (IV) infusion. Intraosseous (IO) infusion. ***Paramedic:*** Maintain infusion once commenced. (***CPG****:* May be used for medication dilution on CPGs).
Indications	Use as a dilutant for Amiodarone infusion.
Contra-Indications	Known severe adverse reaction.
Usual Dosages	***Adult:*** Dilute appropriate dose of Amiodarone in 100 mL or 500 mL. ***Paediatric:*** Not indicated.
Pharmacology / Action	Dextrose 5% (D_5W) is used as an infusion medium for the administration of Amiodarone.
Side effects	Necrosis of tissue around IV access.
Additional information	

Clinical level: AP

Medication	Diazepam injection
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). (***CPG:*** 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	***Adult:*** 5 mg IV/IO. ***Paediatric:*** 0.1 mg/Kg IV/IO. Maximum 4 doses of Benzodiazepine for adult and paediatric patients regardless of route.
Pharmacology / Action	***Benzodiazepine sedative:*** 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 **Long term side effects**	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.
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.

Clinical level: AP

Medication	Diazepam Rectal Solution
Class	Benzodiazepine.
Descriptions	It is a Benzodiazepine that is used to terminate seizures.
Presentation	***Rectal tube***: *Available as:* 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).
Administration	Per Rectum (PR). (***CPG:*** 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	***Adult:*** 10 mg (PR). ***Paediatric:*** *< 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.
Pharmacology / Action	***Benzodiazepine sedative:*** 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 **Long term side effects**	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.
Additional information	Be aware of modesty of patient. Should be administered in the presence of a 2nd 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: MP

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	***Adult:*** 30 mg IV bolus. *(> 75 years:* 0.75 mg/Kg SC). ***Paediatric:*** 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. ***Medical Practitioners****:* Due to the significant increased risk of intra-cerebral bleed for patients aged > *75 years* ***Do Not*** administer IV Enoxaparin. ***Enoxaparin 0.75 mg/Kg SC:*** (Max 75 mg SC) is the recommended dose and route.

Clinical level: AP

Medication	Epinephrine (1:10,000)
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). (***CPG:*** 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	***Adult:*** ***Cardiac arrest:*** 1 mg (1:10,000) IV/IO. (Repeat every 3-5 mins). ***Paediatric:*** ***Cardiac arrest:*** 0.01 mg/Kg (10 mcg/Kg) (0.1 mL/Kg of 1:10,000) IV/IO. (Repeat every 3-5 mins). ***Bradycardia:*** 0.01 mg/Kg (10 mcg/Kg) (0.1 mL/Kg of 1:10,000) IV/IO (Repeat every 3-5 mins).
Pharmacology / Action	***Alpha and beta adrenergic stimulant:*** 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	***In non-cardiac arrest patients:*** Palpitations / Tachyarrhythmias / Hypertension.
Additional Information	***N.B.*** Double check concentrations on pack before use.

APPENDIX 1 - Medication Formulary

Clinical level: EFR EMT P AP

Medication	Epinephrine (1:1,000)
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, ampoule or Auto injector. 1 mg/1 mL (1:1,000).
Administration	Intramuscular (IM), Intravenous (IV) and Nebulisation (Neb) (***CPG:*** 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).
Indications	Severe anaphylaxis, Stridor, Symptomatic Bradycardia and Cardiogenic shock.
Contra-Indications	None known.
Usual Dosages	***Adult: Anaphylaxis*** 0.5 mg **(**500 mcg) IM (0.5 mL of 1: 1,000). ***EFR*** assist patient – 0.3 mg (Auto injector) (Repeat every 5 minutes' prn). ***Adult: Symptomatic Bradycardia/ Cardiogenic shock:*** 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). ***Anaphylaxis Paediatric:*** *< 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) *> 8 years:* - 0.5 mg (500 mcg) IM (0.5 mL of 1:1,000) ***EFR*** assist patient – *6 Months < 10 years:* 0.15 mg (Auto injector) (repeat every 5 minutes prn). *≥ 10 years:* 0.3 mg (Auto injector) (repeat every 5 minutes prn). ***Stridor (AP):*** ***< 1 Year:*** 2.5 mg NEB ***≥ 1 year:*** 5 mg NEB (repeat after 30 minutes' prn) (AP).
Pharmacology / Action	***Alpha and beta adrenergic stimulant:*** Reversal of laryngeal oedema and bronchospasm in anaphylaxis. Antagonises the effects of histamine.
Side effects	Palpitations / Tachyarrhythmias / Hypertension / Angina-like symptoms.
Additional information	***N.B.*** Double check the concentration on pack before use.

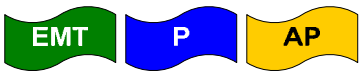
Clinical level: AP

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	***Adult:*** 0.1 mg (100 mcg) IN (Repeat by one at not < 10 minutes if severe pain persists). 0.05 mg (50 mcg) IV ***Paediatric:*** 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 μ-opioid G-protein-coupled receptors, which inhibit pain neurotransmitter release by decreasing intracellular Ca^{2+} levels.
Side effects	Sedation / Nausea / Vomiting / Respiratory depression.
Additional information	***Caution if patient has transdermal Fentanyl patch:*** 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).

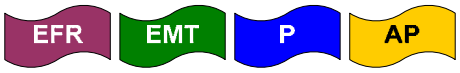
APPENDIX 1 - Medication Formulary

Clinical level: AP

Medication	Furosemide injection
Class	Diuretic.
Descriptions	A loop diuretic.
Presentation	Ampoule 10 mg per mL. 2 mL, 5 mL and 25 mL per ampoule.
Administration	Intravenous (IV). (***CPG:*** 5/6.3.5).
Indications	Pulmonary oedema.
Contra-Indications	Pregnancy / Known Hypokalaemia Known severe adverse reaction.
Usual Dosages	***Adult:*** 40 mg slow IV. ***Paediatric:*** Not indicated.
Pharmacology / Action	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.
Side effects **Long term side effects**	Headache / Dizziness / Hypotension / Arrhythmias / Transient deafness / Diarrhoea / Nausea and Vomiting. Hyperuricaemia / Gout / Hypokalaemia / Hyperglycaemia.
Additional information	Furosemide should be protected from light. SPC recommends administration at 4 mg/min IV.

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) (***CPG:*** 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	< 1 year / Phaeochromocytoma / KSAR
Usual Dosages	***Adult:*** 1 mg IM. ***Paediatric:*** *1 - 8 years* - 0.5 mg (500 mcg) IM. *> 8 years* - 1 mg IM.
Pharmacology / Action	***Glycogenolysis:*** 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 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)

Clinical level: 

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

Clinical level: EFR EMT P AP

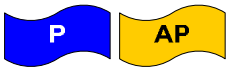
Medication	Glyceryl trinitrate (GTN)
Class	Nitrate.
Descriptions	Special preparation of Glyceryl trinitrate in an aerosol form that delivers precisely 0.4 mg of Glyceryl trinitrate per spray.
Presentation	***Aerosol spray:*** Metered dose of 0.4 mg (400 mcg).
Administration	***Sublingual:*** Hold the pump spray vertically with the valve head uppermost. Place as close to the mouth as possible and spray under the tongue. The mouth should be closed after each dose. (***CPG:*** 5/6.3.5, 5/6.4.10, 4.4.10, 1/2/3.4.10).
Indications	Angina / suspected myocardial infarction (MI). ***EMT:*** Angina / suspected myocardial infarction (MI) with systolic BP ≥ 110 mmHg. ***EFR:*** may assist with administration. ***Advanced Paramedics and Paramedics*** - Pulmonary oedema.
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	***Adult:*** ***Angina or MI:*** 0.4 mg (400 mcg) sublingual. (Repeat at 3-5 min intervals, Max: 1.2 mg). ***EFR:*** assist administration - 0.4 mg sublingual max. ***Pulmonary oedema:*** 0.8 mg (800 mcg) sublingual (repeat x 1 prn) (P & AP). ***Paediatric:*** Not indicated.
Pharmacology / Action	***Vasodilator:*** Releases nitric oxide which acts as a vasodilator. Dilates coronary arteries particularly if in spasm increasing blood flow to myocardium. Dilates systemic veins reducing venous return to the heart (pre-load) and thus reduces the heart's workload. Reduces BP.
Side effects	Headache / Transient Hypotension / Flushing / Dizziness.
Additional information	Caution with inferior wall MI with right ventricular involvement as this may lead to profound hypotension. 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.

Clinical level: AP

Medication	Glycopyrronium Bromide
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). (***CPG:*** 5/6.8.7).
Indications	Palliative care with excessive oropharyngeal secretions.
Contra-Indications	Known severe adverse reaction.
Usual Dosages	***Adult:*** 0.4 mg (400 mcg) SC. ***Paediatric:*** 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.

Clinical level: AP

Medication	Haloperidol
Class	Antipsychotic.
Descriptions	A class of antipsychotic medication used especially in the treatment of schizophrenia.
Presentation	Ampule 5 mg/mL. Capsule 0.5 mg (PO).
Administration	Subcutaneous (SC). Oral (PO). (***CPG:*** 5/6.8.7).
Indications	Palliative care with nausea and vomiting or agitation/delirium.
Contra-Indications	Known severe adverse reaction.
Usual Dosages	***Adult:*** 1 – 2 mg SC/PO. ***Paediatric:*** Not applicable.
Pharmacology / Action	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.
Side effects	Insomnia / Agitation / Hyperkinesia / Headache.
Additional information	For agitation/delirium, consider Midazolam in addition only if severe agitation. For patients receiving palliative care administer their doctor's prescribed dose if known.

Clinical level: 

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

Clinical level: P AP

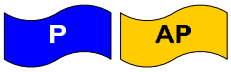
Medication	Hydrocortisone
Class	Corticosteroid and anti-inflammatory.
Descriptions	Hydrocortisone is a potent corticosteroid with anti-inflammatory properties.
Presentation	Powder and solvent for solution for injection or infusion. Vial containing off-white powder and vial containing water for injections. 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	***Adult:*** ***Anaphylactic reaction:*** (AP) 200 mg IV (infusion in 100 mL NaCl) or IM injection (P/AP). ***Exacerbation of COPD:*** 200 mg IV (infusion in 100 mL NaCl) or IM (AP). ***Asthma:*** 100 mg slow IV (infusion in 100 mL NaCl) (AP). ***Adrenal insufficiency:*** (AP) 100 mg IV (infusion in 100 mL NaCl) or IM (P/AP). ***Paediatric:*** ***Anaphylactic reaction:*** *< 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). ***Asthma:*** (AP) *< 1 year:* 25 mg IV / *1 to 5 years:* 50 mg IV / *> 5 years:* 100 mg IV - (infusion in 100 mL NaCl). ***Adrenal insufficiency:*** *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 **Long term side effects**	CCF / Hypertension / Abdominal distension / Vertigo / Headache / Nausea / Malaise and hiccups. 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. If the patient, in an adrenal crisis, is still unwell following Hydrocortisone administration prior to arrival of the practitioner the standard dose of Hydrocortisone should be administered.

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	***Adult:*** 10 – 20 mg SC. ***Paediatric:*** 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.

Clinical level: EMT P AP

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). (***CPG:*** 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	***Adult:*** 400 mg PO (Mild pain). 600 mg PO (Moderate pain). ***Paediatric:*** 10 mg/Kg PO to a maximum of 400 mg.
Pharmacology / Action	Suppresses prostaglandins, which cause pain via the inhibition of cyclooxygenase (COX). Prostaglandins are released by cell damage and inflammation.
Side effects **Long term side effects**	Skin rashes / Gastrointestinal intolerance and bleeding. 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 or 400 mg for paediatrics. 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.

Clinical level: 

Medication	Ipratropium Bromide
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. (***CPG:*** 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	***Adult:*** 0.5 mg (500 mcg) NEB. ***Paediatric:*** *< 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
Class	Ketamine is a dissociative anaesthetic agent with analgesic properties.
Descriptions	Ketamine acts as an *N*-methyl-D-aspartate (NMDA) receptor noncompetitive antagonist. Combined with Morphine, Ketamine demonstrates beneficial effects in trauma patients with severe acute pain.
Presentation	White crystalline powder or clear liquid. Vial 200 mg in 20 mL.
Administration	Intravenous (IV). (***CPG:*** 4/5/6.2.6, 4/5/6.7.5).
Indications	***Adult:*** Severe pain. ***Paediatric:*** Severe pain.
Contra-Indications	Acute porphyrias / Pre-eclampsia / Eclampsia / Head trauma / Hypertension / Severe cardiac disease / Stroke / KSAR.
Usual Dosages	***Adult:*** 0.1 mg/Kg IV (repeat once only at not < 10 minutes prn). ***Paediatric:*** 0.1 mg/Kg IV (repeat once only at not < 10 minutes prn).
Pharmacology / Action	Induces sedation, immobility amnesia, and marked analgesia.
Side effects	Diplopia / Hallucinations / Hypertension / Nausea and Vomiting / Tachycardia / Transient psychotic effects. ***Uncommon:*** Arrhythmias / Bradycardia / Hypotension / Laryngospasm / Respiratory depression.
Additional information	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).

Clinical level: AP

Medication	Lidocaine
Class	Antiarrhythmic.
Descriptions	Ventricular antiarrhythmic agent.
Presentation	Lidocaine injection Mini jet 1% w/v 100 mg per 10 mL. 5 mg/ 5 mL 1%
Administration	Intravenous (IV). Intraosseous (IO). (***CPG:*** 5/6.4.3, 4/5/6.7.22).
Indications	When Amiodarone is unavailable it may be substituted with Lidocaine for VF/pVT arrests - *(Special authorisation required).* Solvent for Ceftriaxone IM
Contra-Indications	No contraindications for cardiac arrest. KSAR when used as a dilutant for Ceftriaxone.
Usual Dosages	***Adult:*** 100 mg IV. Solvent 3.5 mL for Ceftriaxone IM ***Paediatric:*** 1-1.5 mg/Kg IV. Solvent 3.5 mL for Ceftriaxone IM
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.

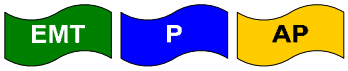
Clinical level: AP

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

Clinical level: AP

Medication	Magnesium Sulphate injection
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). (***CPG:*** 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	***Adults:*** ***Life-threatening Asthma:*** 2 g IV (infusion in 100 mL NaCl) given over 20 minutes. ***Tachycardia – Irregular:*** *Torsades de pointes with a pulse:* 2 g IV (infusion in 100mL NaCl) given over 10 - 15 minutes. ***Persistent bronchospasm:*** 2 g IV (infusion in 100 mL NaCl) given over 20 minutes. ***Seizure associated with pre-eclampsia:*** 4 g IV (infusion in 100 mL NaCl) given over 15 minutes. ***Paediatric:*** Not indicated.
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	**Methoxyflurane**
Class	Volatile anaesthetic agent.
Descriptions	Clear, almost colourless, volatile liquid, with a characteristic fruity odour that becomes a vapour or gas when used with the single use inhaler.
Presentation	3 mL vial with a tear off tamper-evident seal.
Administration	Inhaled (INH) through an activated Carbon Chamber (self-administered). (***CPG:*** 4/5/6.2.6, 4/5/6.7.5).
Indications	***Adult:*** Moderate to severe pain. ***Paediatric:*** Moderate to severe pain.
Contra-Indications	< 5 years old Altered LOC due to head injury, drugs or alcohol / Cardiovascular instability / Respiratory depression / Renal Failure or Impairment / KSAR.
Usual Dosages	***Adult:*** 3 mL (INH) (repeat x 1 only prn). ***Paediatric:*** 3 mL (INH) (repeat x 1 only prn).
Pharmacology / Action	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.
Side effects	Amnesia / Anxiety / Depression / Dizziness / Dysarthria / Dysgeusia / Euphoria / Headache / Sensory neuropathy / Somnolence / Hypotension / Coughing / Dry mouth / Nausea / Feeling drunk / Sweating. ***Uncommon:*** Tingling or numbness to hands and feet / Tiredness / Mouth discomfort.
Additional information	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. 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.

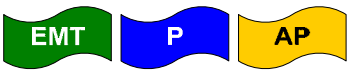
Clinical level: P AP

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	***Ampoule:*** 10 mg in 2 mL or 10 mg in 5 mL. ***Pre-filled syringe:*** 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. ***Buccal liquid:*** 50 mg in 5 mL.
Administration	Buccal / IN / IM / IV / IO. Intranasal (IN) (50% in each nostril). (***CPG:*** 5/6.4.23, 4/5/6.4.30, 5/6.7.33, 5/6.8.7).
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	***Adult:*** ***Seizure:*** 10 mg buccal, 5 mg IN or 5 mg IM (P/AP) 2.5 mg IV/IO (AP) ***Palliative Care:*** 2.5 mg SC (AP) *Alternatively* 2.5 - 5 mg buccal (P/AP) repeat x 1 prn. ***Behavioural Emergency:*** AP - Seek medical advice regarding sedation. 5 mg IN/IM - (repeat x 2 prn) (AP). ***Paediatric****:* ***Seizure****:* < 3 months: - 1.25 mg buccal 3 months to < *1 year:* - 2.5 mg buccal *1 year to < 5 years:* - 5 mg buccal *5 years to < 10 years:* - 7.5 mg buccal ≥ *10 years:* - 10 mg buccal Or 0.2 mg/Kg intranasal (P & AP) or 0.1 mg/Kg IV/IO (AP) Maximum 4 doses of Benzodiazepine for adult and paediatric seizing patients regardless of route. Repeat at not < 5 minutes prn. ***Behavioural Emergency:*** AP - Seek medical advice regarding sedation. 0.1 mg/Kg IN - (repeat x 2 prn) (AP).
Pharmacology / Action	It affects the activity of a chemical that transmits impulses across nerve synapses called Gmma-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	Midazolam IV should be titrated to effect. Ensure Oxygen and resuscitation equipment are available prior to administration. Practitioners should take into account the dose administered by carers prior to arrival of practitioner. 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).

APPENDIX 1 - Medication Formulary

Clinical level: AP

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

Clinical Level: 

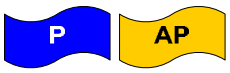
Medication	Naloxone
Class	Narcotic antagonist.
Descriptions	Effective in management and reversal of overdoses caused by narcotics or synthetic narcotic agents.
Presentation	Ampoules 0.4 mg in 1 mL (400 mcg /1 mL) or pre-loaded syringe.
Administration	IV / IO / IM / SC / IN. (***CPG**:* 5/6.4.7, 4/5.4.22, 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	***Adult:*** 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). ***Paediatric:*** 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	***Narcotic antagonist:*** 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.

Clinical level: AP

Medication	Nifedipine
Class	Tocolytic agent and calcium channel blocker.
Descriptions	Dihydropyridine calcium channel blocker.
Presentation	10 mg tablet (standard preparation).
Administration	PO (***CPG:*** 4/5/6.5.5)
Indications	Prolapsed cord.
Contra-Indications	Hypotension. Known severe adverse reaction.
Usual Dosages	***Adults:*** 20 mg PO. ***Paediatric:*** 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.

Clinical Level: EMT P AP

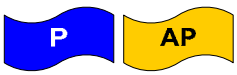
Medication	Nitrous Oxide 50% and Oxygen 50% (Entonox®)
Class	Analgesic.
Descriptions	Potent analgesic gas contains a mixture of both Nitrous Oxide and Oxygen.
Presentation	Cylinder, coloured blue with white and blue triangles on cylinder shoulders. ***Medical gas:*** 50% Nitrous Oxide & 50% Oxygen.
Administration	Self-administered. Inhalation by demand valve with face-mask or mouthpiece. (***CPG:*** 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	***Adult:*** Self-administered until pain tolerable. ***Paediatric:*** Self-administered until pain tolerable.
Pharmacology / Action	***Analgesic agent gas:*** 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. ***Brand name:*** Entonox®. Has an addictive property. Caution when using Entonox® for greater than one hour for sickle cell crisis.

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. (***CPG:*** 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	***Adult:*** 4 mg IM (P/AP) or slow IV (AP). ***Paediatric:*** *0.1 mg*/kg 0.1 mg/Kg (100 mcg / 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	***General:*** Flushing / Headache / Sensation of warmth/ Injection site reactions (rash, urticaria, itching). ***Uncommon:*** 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.

Clinical Level: EFR EMT P AP

Medication	Oxygen
Class	Gas.
Descriptions	Odourless / Tasteless / Colourless gas necessary for life.
Presentation	***Medical gas:*** D, E or F cylinders, coloured black with white shoulders. ***CD cylinder:*** White cylinder.
Administration	***Inhalation via:*** High concentration reservoir (non-rebreather) mask / Simple face mask / Venturi mask / Tracheostomy mask / Nasal cannulae / CPAP device / Bag Valve Mask. **(*CPG:* Oxygen is used extensively throughout the CPGs).**
Indications	Absent / Inadequate ventilation following an acute medical or traumatic event. SpO_2 < 94% adults and < 96% paediatrics. SpO_2 < 92% for patients with acute exacerbation of COPD. SpO_2 < 90% for patients with acute onset of Pulmonary Oedema.
Contra-Indications	Bleomycin lung injury.
Usual Dosages	***Adult:*** Cardiac and respiratory arrest or sickle cell crisis; 100%. Life threats identified during primary survey; 100% until a reliable SpO_2 measurement obtained then titrate O_2 to achieve SpO_2 of 94% - 98%. For patients with acute exacerbation of COPD, administer O_2 titrate to achieve SpO_2 92% or as specified on COPD Oxygen Alert Card. All other acute medical and trauma titrate O_2 to achieve SpO_2 94% - 98%. ***Paediatric:*** Cardiac and respiratory arrest or sickle cell crisis; 100%. Life threats identified during primary survey; 100% until a reliable SpO_2 measurement obtained then titrate O_2 to achieve SpO_2 of 96% - 98%. Neonatal resuscitation (< 4 weeks) consider supplemental O_2 (≤ 30%). All other acute medical and trauma titrate O_2 to achieve SpO_2 of 96% - 98%.
Pharmacology / Action	Oxygenation of tissue/organs.
Side effects	Prolonged use of O_2 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_2 < 92%. Avoid naked flames, powerful oxidising agent.

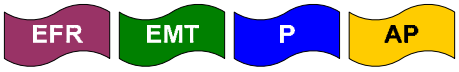
Clinical Level: 

Medication	**Oxytocin**
Class	Synthetic hormone.
Descriptions	Synthetic Oxytocin 5 international units per mL.
Presentation	5 international units in 1 mL ampoule.
Administration	IM. (***CPG*: 4/5/6.5.4).**
Indications	Control of post-partum haemorrhage.
Contra-Indications	Severe cardiac dysfunction / KSAR.
Usual Dosages	***Adult:*** 5 international units IM. ***Paediatric:*** 5 international units IM.
Pharmacology / Action	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.
Side effects	Cardiac arrhythmias / Headache / Nausea and vomiting / Hypotension / Abdominal pain / Dizziness.
Additional information	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: EMT P AP

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. Plastic 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	***Adult:*** Pyrexia / Temperature > 38.3°C / Mild or moderate pain. ***Paediatric:*** Pyrexia / Temperature > 38.5°C / Mild or moderate pain.
Contra-Indications	< 1 month old / Known severe adverse reaction / Chronic liver disease.
Usual Dosages	***Adult:*** 1 g PO (EMT, P/AP). 1 g IV infusion (AP), if estimated weight < 50 kg, 15 mg/kg (administered slowly over 15 minutes). ***Palliative Care:*** 1g PO (Repeat x 1 prn). ***Paediatric:*** **PO** (EMT, P/AP): 20 mg/Kg PO **PR** (AP): *>1 month < 1 year* - 90 mg PR; *1-3 years* - 180 mg PR; *4-8 years* - 360 mg PR **IV Infusion** (AP): *< 1 year* – 7.5 mg/kg IV slowly; *≥ 1 year* – 15 mg/kg IV slowly
Pharmacology / Action	Analgesic – central prostaglandin inhibitor. Antipyretic – prevents the hypothalamus from synthesising prostaglandin E, inhibiting the body temperature from rising further.
Side effects **Long term side effects**	If Paracetamol IV is administered too fast it may result in hypotension. Long term use at high dosage or over dosage can cause liver damage and less frequently renal damage.
Additional information	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 2nd 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. Caution with IV Paracetamol in the absence of a buretrol.

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. *Aerosol inhaler:* Metered dose 0.1 mg (100 mcg).
Administration	NEB. Inhalation via aerosol inhaler. (***CPG:*** 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	***Adult:*** 5 mg NEB or 0.1 mg metered aerosol spray (repeat aerosol x 11) Repeat NEB at 5 minute intervals prn ***EFR*** assist patient with Asthma/ Anaphylaxis. - 0.1 mg metered aerosol spray (repeat aerosol x 11 prn) ***Paediatric:*** < *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 NEB at 5 minute intervals prn). ***EFR:*** 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.

Clinical level: AP

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

Clinical Level: P AP

Medication	Sodium Chloride 0.9% (NaCl)
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. ***Paramedic****:* maintain infusion once commenced. (***CPG:* Sodium Chloride 0.9% is used extensively throughout the CPGs**).
Indications	IV/IO fluid for pre-hospital emergency care.
Contra-Indications	Known severe adverse reaction.
Usual Dosages	***Adult:*** Keep vein open (KVO) or medication flush for cardiac arrest prn. ***Asystole / PEA*** - Consider fluid challenge 1 L IV/IO (repeat prn). ***Crush injury*** - 20 mL/Kg IV/IO infusion. ***Suspension Trauma*** - 2 L IV (Maintain systolic BP > 90 mmHg). ***Hypothermia****:* 250 mL IV/IO infusion (warmed to 40ºC approx.) (Repeat to max 1 L). ***# Neck of femur / Sepsis / Symptomatic bradycardia / Tachycardia*** -Torsades de pointes: 250 mL IV infusion. ***Decompression illness / Sepsis with poor perfusion:*** 500 mL IV/IO infusion. ***Shock from blood loss:*** 500 mL IV/IO infusion. Repeat in aliquots of 250 mL IV/IO to maintain SBP of 90-100 mmHg. For associated **Head injury** with GCS ≤ 8 maintain SBP of 120 mmHg. ***Burns:*** > 25% TBSA and / or 1 hour from time of injury to ED, 1000 mL IV/IO infusion. > 10% TBSA consider 500 mL IV/IO infusion. ***Adrenal insufficiency / Glycaemic Emergency / Heat Related Emergency / Sickle Cell Crisis:*** 1,000 mL IV/IO infusion. ***Anaphylaxis and Postpartum Haemorrhage:*** 1,000 mL IV/IO infusion (repeat x 1 prn). ***Post-resuscitation care:*** 250 mL IV/IO infusion, if persistent hypotension to maintain SBP > 100 mmHg or MAP > 70 mmHg. ***Paediatric:*** ***Glycaemic Emergency / Neonatal Resuscitation / Sickle Cell Crisis:*** 10 mL/Kg IV/IO infusion. ***Hypothermia:*** 10 mL/Kg IV/IO infusion (warmed to 40ºC approx.) (repeat x 1 prn). ***Haemorrhagic shock:*** 10 mL/Kg IV/IO repeat prn if signs of inadequate perfusion. ***Anaphylaxis:*** 20 mL/Kg IV/IO infusion (repeat x 1 prn). ***Adrenal insufficiency / Crush injury / Septic shock / Suspension Trauma / Symptomatic Bradycardia:*** 20 mL/Kg IV/IO infusion. ***Asystole / PEA*** – Consider fluid challenge 20 mL/Kg IV/IO. ***Post-resuscitation care:*** 20 mL/Kg IV/IO infusion if persistent poor perfusion or < 5th percentile SBP. ***Burns:*** *> 10% TBSA and / or > 1 hour from time of injury to ED:* • ***5 – 10 years:*** 250 mL IV/IO / • ***> 10 years:*** 500 mL IV/IO.
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.

Clinical level: MP

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. (***CPG:*** 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	***Adult:*** 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 ***Paediatric:*** Not indicated.
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.

Clinical level: P AP

Medication	Ticagrelor
Class	Platelet aggregation inhibitor.
Descriptions	An inhibitor of platelet function.
Presentation	90 mg tablets.
Administration	PO. (***CPG:*** 5/6.4.10).
Indications	Identification of ST elevation myocardial infarction (STEMI) if transporting to PPCI centre.
Contra-Indications	Hypersensitivity to the active substance (Ticagrelor) or to any of the excipients / Active pathological bleeding / History of intracranial haemorrhage / Moderate to severe hepatic impairment.
Usual Dosages	***Adult:*** Loading dose 180 mg PO. ***Paediatric:*** Not indicated.
Pharmacology / Action	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.
Side effects	***Common:*** Dyspnoea / Epistaxis / Gastrointestinal haemorrhage / Subcutaneous or dermal bleeding / Bruising and Procedural site haemorrhage. ***Other undesirable effects include:*** Intracranial bleeding / Elevations of serum creatinine and uric acid levels. Consult SmPC for a full list of undesirable effects.
Additional information	***Special authorisation:*** 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.

Clinical level: AP

Medication	Tranexamic Acid
Class	Anti-fibrinolytic.
Descriptions	An anti-fibrinolytic which reduces the breakdown of blood clots.
Presentation	Ampoule 500 mg in 5 mL.
Administration	Intravenous injection (IV). Intraosseous (IO). (***CPG:*** 5/6.6.8, 4/5/6.5.4).
Indications	Suspected significant internal or external haemorrhage associated with trauma Postpartum Haemorrhage.
Contra-Indications	Hypersensitivity to the active substance or to any of the excipients / Acute venous or arterial thrombosis / History of convulsions / Known severe renal impairment.
Usual Dosages	***Adult:*** 1 g IV/IO (infusion in 100 mL NaCl). ***Paediatric:*** Not indicated.
Pharmacology / Action	Tranexamic acid exerts an anti-haemorrhagic activity by inhibiting the activation of plasminogen to plasmin, by binding to specific sites of plasaminogen and plasmin, a molecule responsible for the degradation of fibrin, a protein that forms the framework of blood clots.
Side effects	***Common:*** Diarrhoea / Nausea / Vomiting. ***Other undesirable effects include:*** Visual disturbance / Impaired coloured vision / Dizziness / Headache.
Additional information	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_2 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_2 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 Extraction				✓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					✓	✓	✓
Glucometery					✓	✓	✓
Paediatric Assessment Triangle					✓	✓	✓
Pain assessment					✓	✓	✓
Patient Clinical Status					✓	✓	✓
Temperature ^{O}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.

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
- 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
- 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.

Updated AP CPGs from the 2014 version

To support upskilling of the 2017 CPGs, the changes are outlined below. Changes in blue text relate to the 2018 updates.

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	The CPG layout has been changed significantly **Deleted** 'And/or' - for Paracetamol and Ibuprofen for moderate pain Scores depicting severe, moderate and mild pain **Added** 'Consider medical support' Pathway to nausea & vomiting CPG Management of severe pain classified into 1st, 2nd and 3rd line administration of analgesia Methoxyflurane 3 mL INH for moderate pain Paracetamol 1 g IV for severe pain (2nd line) Ketamine 0.1 mg/Kg IV for severe pain (3rd line) **Medication updates** Ibuprofen for mild pain Ibuprofen dose increased to 600 mg PO for moderate pain in conjunction with Paracetamol 1 g PO Morphine initial dose increased to 4 mg IV Morphine maximum dose increased to 16 mg and 20 mg for musculoskeletal pain Fentanyl 0.05 mg IV for severe pain 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 Option to administer Fentanyl 0.05 mg IV OR Morphine 4 mg IV AND/OR Paracetamol 1 g IV for 2nd line management of severe pain
CPG 5/6.3.1 Advanced Airway Management – Adult	**Deleted** Information box regarding CPR hands-off time **Updated**

APPENDIX 4 - CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
	Capnography now mandatory with ETT insertion, with waveform capnography the preferred option
CPG 4/5/6.3.4 Asthma – Adult	**Added** Consider CO_2 monitoring 'Consider FEFR prior to Salbutamol administration' – advice box **Medication update** Salbutamol aerosol 0.1 mg repeat increased from 5 to 11 times
CPG 4/5/6.4.1 Basic Life Support – Adult	**Deleted** 'Commence CPR while defibrillator is being prepared only if 2nd person available' Chest compression depth: at least 5 cm **Added** '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
CPG 4/5/6.4.3 VF or pVT – Adult	Renamed from 'VF or Pulseless VT – Adult' to 'VF or pVT – Adult' **Deleted** Driving graphic and information box regarding mechanical CPR device Amiodarone weight-based dose **Added** Defibrillate – (escalating energy) **Medication updates** Epinephrine every 2nd cycle If refractory VF/pVT administer Amiodarone post Epinephrine and 3rd shock, second dose after 5th shock Lidocaine dose changed from 1 – 1.5 mg/Kg to 100 mg IV
CPG 5/6.4.4 Asystole – Adult	**Deleted** Information box regarding CPR hands-off time Consider waveform capnography **Medication updates** 1st dose of Epinephrine instruction Epinephrine every 2nd cycle Fluid challenge changed from 20 mL/Kg to 1 L NaCl

APPENDIX 4 - CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
CPG 4/5/6.4.6 Pulseless Electrical Activity – Adult CPG 4/5/6.4.6 Pulseless Electrical Activity – Adult (Contd.)	**Deleted** Driving graphic and information box regarding mechanical CPR device Information box regarding CPR hands-off time Consider waveform capnography **Medication updates** 1st dose of Epinephrine instruction Epinephrine every 2nd cycle Fluid challenge changed from 20 mL/Kg to 1 L NaCl
CPG 5/6.4.7 Post-Resuscitation Care – Adult	**Deleted** 'Positive pressure ventilations' mandatory box Titrate O_2 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 **Added** 'Airway' to first decision box 'Consider advanced airway and positive pressure ventilations' '$ETCO_2$' added to ECG and SpO_2 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 **Medication updates** 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	**Deleted** 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 **Added** 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 **Medication updates** 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	12 Lead ECG now performed before the administration of Atropine

APPENDIX 4 - CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
Symptomatic Bradycardia – Adult	**Added** Epinephrine 0.01 mg IV, for suspected cardiogenic shock 'Non-symptomatic' - titrating Atropine to effect (HR > 60)
CPG 5/6.4.12 Tachycardia – Adult	The algorithm flow through the CPG has been modified extensively **Deleted** Symptomatic – decision diamond **Added** 'non-sinus tachycardia' – new entry point to CPG 'Adverse signs' decision diamond (replacing 'symptomatic') 'If unsuccessful escalate energy by 50 J' - synchronised cardioversion 'If Atrial Fibrillation seek medical support' has been added after cardioversion. **New Medications** Adenosine 6 mg IV NaCl 500 mL IV
CPG 4/5/6.4.15 Allergic Reaction/Anaphylaxis – Adult	**Deleted** 'Angio-oedema' from mild allergic signs 'No improvement' from re-occurs decision diamond 'Asthma' replaced with 'bronchospasm' **Added** 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 **New Medications** Hydrocortisone IM for paramedic use Chlorphenamine PO/IM/IV Chlorphenamine 10 mg IV for moderate allergic reaction
CPG 4/5/6.4.16 Decompression Illness	Updated to reflect paramedic authorisation of antiemetic
CPG 4/5/6.4.19 Glycaemic Emergency – Adult	The algorithm flow through the CPG has been modified **Added** EMT level – all three practitioner levels now combined 'Conscious/able to swallow' decision diamond for hypoglycaemia

APPENDIX 4 - CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
	Yes - Glucose gel 10 - 20 g buccal, sweetened drink No - Dextrose or Glucagon 1 mg IM 'Advise a carbohydrate meal (sandwich)' An advisory box: 'Check for presence of an insulin pump; turn off or remove if present'
CPG 5/6.4.23 Seizure/Convulsion – Adult CPG 5/6.4.23 Seizure/Convulsion – Adult (Contd.)	**Deleted** IV access (yes/no) – decision diamond **Medication updates** Benzodiazepine - maximum 4 doses regardless of route Consider medical advice if more than 4 doses indicated
CPG 4/5/6.4.24 Sepsis – Adult	**Deleted** Benzylpenicillin Commence with 100% O_2 **Added** 'advise triage nurse if SIRS + infection' 'On immune-suppressant medication' – Could this be severe infection? 'BP monitoring' O_2 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 **Medication updates** 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 **New Medications** Ceftriaxone 2 g IV/IO/IM Paracetamol 1 g IV
CPG 5/6.4.26 Significant Nausea & Vomiting – Adult	**Deleted** 'Post-narcotic administration for pain relief' decision diamond **Added** Paramedic level Check blood glucose Investigate and treat underlying cause

APPENDIX 4 - CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
	Medication updates Cyclizine 50 mg IM Ondansetron 4 mg IM
CPG 5/6.4.28 Stroke CPG 5/6.4.28 Stroke (Contd.)	**Deleted** Notifying ED prior to arrival following negative FAST assessment Oxygen therapy advice box **Added** 'T' in FAST changed to 'time of onset' from 'time to transport'
CPG 6.4.29 Mental Health Emergency	The wording of the CPG entry point updated to read; 'abnormal behaviour with a history of psychiatric illness' **Deleted** Midazolam IM or IV Lorazepam PO **Added** Consider consulting with medical advice if clinical judgement is that sedation may be required for a combative patient Capacity assessment updated to reflect Assisted Decision Making (Capacity) Act 2015 requirements
CPG 4/5/6.4.30 Behavioural Emergency	The algorithm flow through the CPG has been modified extensively **Deleted** 'Saloon of ambulance' to reflect other modes of transport when considering two or more people accompanying the patient **Added** Capacity assessment updated to reflect Assisted Decision Making (Capacity) Act 2015 requirements Three potential causes of behavioural emergency; mental health, medical or traumatic causation and intoxication or withdrawal Decision diamond for patients 'aggressive/violent and/or risk to self or others and uncooperative with practitioner' For patients who are aggressive/violent and/or risk to self or others and uncooperative with practitioner; • ensure practitioner safety (await Garda if any doubt) • request ALS • consider verbal de-escalation • hand-over to Garda care if the patient has capacity and declines care • hand-over to registered medical practitioner/Garda care if the patient has capacity and is ill • consider treating reversible causes with Garda assistance • AP to seek medical advice regarding sedation and document shared decision, if aggression continuing

APPENDIX 4 - CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
	New Medications Midazolam 5 mg IN/IM – Adult Midazolam 0.1 mg/Kg IN – Paediatric Lorazepam 2 mg PO – Adult
CPG 5/6.5.1 Pre-Hospital Emergency Childbirth	**Deleted** Gestation period < 28 weeks – decision diamond **Added** Gestation period < 32 weeks – decision diamond Preference for skin to skin (when wrapping baby and presenting to mother)
CPG 5/6.5.2 Basic & Advanced Life Support – Neonate (< 4 weeks)	**Deleted** Gestation period < 28 weeks – decision diamond Give supplementary O_2 **Added** Gestation period < 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 < 100' '(room air)' - Provide 5 positive pressure ventilations 30 second PPV (40 - 60 breaths per minute) - until breathing well, HR > 100 Consider supplemental O_2 (≤ 30%) 'Monitor heart rate' decision diamond changed from 'assess heart rate' 'Pulse oximetry' changed to mandatory from consider
CPG 4/5/6.5.3 PV Haemorrhage in Pregnancy	Renamed from 'Haemorrhage in Pregnancy Prior to Delivery' to 'PV Haemorrhage in Pregnancy'. **Deleted** 'Query' from entry point **Added** EMT level ECG & SPO_2 monitoring
CPG 4/5/6.5.4 Postpartum Haemorrhage	**Deleted**; Syntometrine 1 mL IM Go to Shock CPG **Added**

APPENDIX 4 - CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
	EMT level External massage of the uterus - for paramedic level **New Medications** Tranexamic Acid 1 g IV Oxytocin 5 international units IM NaCl 1 L IV
CPG 4/5/6.5.5 Umbilical Cord Complications	**Deleted** 'Knee chest position' 'Clamp the cord in two places and cut between both clamps' **Added** EMT level 'Head down left lateral position' new terminology replacing 'knee chest position' 'Hold presenting part off the cord using fingers' introduced for paramedic level 'as shoulders are delivered' added to 'Ease the cord from around the neck'
CPG 5/6.5.6 Breech Birth	**Deleted** 'Oxygen therapy' The restriction on paramedic assisting directly with breech birth **Added** 'Consider Oxygen therapy'
CPG 4/5/6.6.3 External Haemorrhage – Adult	**Added** 'Consider wound closure clips for temporary closure if still bleeding' – AP, P & EMT-BTEC level
CPG 4/5/6.6.4 Harness Induced Suspension Trauma	**Medication update** NaCl (0.9%) 2 L IV maintain Sys BP > 90 mmHg
CPG 5/6.6.5 Head Injury	Renamed from 'Head Injury – Adult' to 'Head Injury' to incorporate all age groups **Added** GCS table for < 4 years old GCS table for ≥ 4 years old
CPG 4/5/6.6.6 Heat Related Emergency – Adult	**Deleted** 'Exercise related dehydration should be treated with oral fluids (caution with over-hydration with water)'
CPG 4/5/6.6.7 Limb Injury – Adult	**Deleted** 'Consider paramedic' **Added** 'Request ALS' – following mid shaft femur fracture Reduction of isolated lateral dislocation of patella – paramedic level

APPENDIX 4 - CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
CPG 5/6.6.8 Actual/Potential Shock from Blood Loss (trauma) – Adult	Renamed from 'Shock from Blood Loss (trauma) – Adult' to 'Actual/Potential Shock from Blood Loss (trauma) – Adult' **Added** Second entry route to CPG (mechanism suggestive of significant risk of haemorrhage) 'Prioritise transport' - for non-trapped patients 'Clinical signs of shock' - decision diamond Clinical pathway for transport of patients where there is no suspected significant internal/external haemorrhage
CPG 5/6.6.9 Spinal Injury Management	Renamed from 'Spinal Immobilisation – Adult' to 'Spinal Injury Management' incorporating both Adult and Paediatric patients This CPG has had significant alterations with a change in philosophy from 'spinal rule out' to 'spinal rule in' **Deleted** 'with any of the above' after both age 65 years and age 2 years in the high risk factors. 'Manual in line stabilisation' in 1st box. 'manual' in the definition of active spinal motion restriction **Added** 'Active spinal motion restriction' in 1st box 'Assess risk factors' decision after 'Remove helmet' 'Continue' prior to 'active spinal motion restriction' **Practitioners are referred to Appendix 6 – Spinal Injury Management Recommendations for supporting information** **Full PHECC policy statement available at www.phecc.ie**
CPG 4/5/6.7.4 Secondary Survey – Paediatric (≤ 15 years)	**Deleted** 'Check for normal patterns of feeding, toilet, sleeping, interaction with guardian' Head-to-toe examination list **Added** Take SAMPLE history Irish Children's Triage System normal range of vital signs
CPG 4/5/6.7.5 Pain Management – Paediatric (≤ 15 years)	The CPG layout has been changed significantly **Deleted** 'And/or' - for Paracetamol and Ibuprofen for moderate pain Scores depicting severe, moderate and mild pain **Added** 'Consider medical support'

APPENDIX 4 - CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
	Pathway to nausea & vomiting CPG Management of severe pain classified into 1st, 2nd and 3rd line administration of analgesia Request ALS if pain management is not resolved Methoxyflurane 3 mL INH for moderate pain (≥ 5 year olds) Paracetamol 1 g IV (≤ 1 year 7.5 mg/Kg IV, > 1 year 15 mg/Kg IV) for severe pain Ketamine 0.1 mg/Kg IV for severe pain **Medication updates** Ibuprofen 10 mg/Kg PO for mild pain Ibuprofen 10 mg/Kg PO in conjunction with Paracetamol 20 mg/Kg PO for moderate pain Ondansetron IM (AP) Following initial Fentanyl IN the next dose can be either Fentanyl IN or Morphine IV but not both
CPG 6.7.10 Advanced Airway Management – Paediatric (≤ 15 years)	**Deleted** 'Prolonged CPR' - entry point 'Adequate ventilation & oxygenation' - information box 'Minimum interruption of chest compressions' - information box **Added** 'Apnoea or special clinical considerations' - entry point 'Capnography mandatory with ETT insertion (waveform capnography is preferred)' 'Maximum two attempts at ETT and maximum two attempts at supraglottic airway insertion (either as primary device or rescue from failed ETT)' - instruction box
CPG 4/5/6.7.12 Asthma – Paediatric (≤ 15 years)	**Added** 'Consider FEFR prior to Salbutamol administration' – advice box
CPG 4/5/6.7.13 Stridor – Paediatric (≤ 15 years)	'Humidified O_2' and 'Do not distress' moved to earlier in the treatment algorithm **Added** 'Request ALS' Epinephrine nebulised (< 1 year 2.5 mg & > 1 year of age 5 mg) 'Check temperature and if > 38.5° C - go to Sepsis CPG'
CPG 4/5/6.7.20 Basic Life Support – Paediatric (≤ 15 years)	**Deleted** 'Minimum interruption of chest compressions' - information box 'Continue CPR while defibrillator is charging' - information box 'Minimal interruptions of chest compressions and maximum hands-off time 10 seconds' - information box **Added** 'Chest compression depth of 5 cm for a child and 4 cm for a small child or infant' - information box

APPENDIX 4 - CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
	'4 J/Kg' - Shockable rhythms
CPG 4/5/6.7.22 VF or pVT – Paediatric (≤ 15 years)	Renamed from 'VF or Pulseless VT – Paediatric (≤ 15 years)' to 'VF or pVT – Paediatric (≤ 15 years)' **Deleted** 'With CPR ongoing maximum hands-off chest 10 seconds and CPR during charging' - information box 'Transport to ED if no change after 10 minutes resuscitation if no ALS available' Driving graphic 'Mechanical CPR device' - information box **Added** '100% Oxygen' 'Transport to ED if no change after 20 minutes resuscitation if no ALS available' Administration of Amiodarone amended to advise administration after third shock for refractory VF/VT post Epinephrine (5 mg/Kg IV/IO) Paramedic flag for advanced airway management **Medication updates** Epinephrine every 2nd cycle If refractory VF/pVT Amiodarone after Epinephrine and 3rd shock
CPG 4/5/6.7.23 Asystole/PEA – Paediatric (≤ 15 years)	**Deleted** 'With CPR ongoing maximum hands-off chest 10 seconds and CPR during charging' - information box 'Transport to ED if no change after 10 minutes resuscitation if no ALS available' Driving graphic 'Mechanical CPR device' - information box **Added** '100% Oxygen' 'Transport to ED if no change after 20 minutes resuscitation if no ALS available' Paramedic flag for advanced airway management **Medication update** Initial Epinephrine as soon as practical
CPG 4/5/6.7.24 Symptomatic Bradycardia – Paediatric (≤ 15 Years)	**Medication update** Epinephrine every 2nd cycle
CPG 5/6.7.25 Post-Resuscitation Care – Paediatric (≤ 15 years)	**Deleted** 'Commence active cooling' **Added** 'Prevent warming' 12 Lead ECG

APPENDIX 4 - CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
	'Consider $ETCO_2$ monitoring' '5th percentile systolic BP = 70 mmHg + (2 x age)' – information box **Medication update** NaCl - if < 5th percentile systolic BP
CPG 4/5/6.7.31 Allergic Reaction/Anaphylaxis – Paediatric (≤ 15 years) CPG 4/5/6.7.31 Allergic Reaction/Anaphylaxis – Paediatric (≤ 15 years) (Contd.)	**Deleted** 'Angio-oedema' from mild allergic signs 'No improvement' from re-occurs decision diamond 'Asthma' replaced by 'bronchospasm' **Added** 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) (age specific dose) IM **New Medications** Hydrocortisone (age specific dose) IM for paramedic use Chlorphenamine PO/IM/IV
CPG 4/5/6.7.32 Glycaemic Emergency – Paediatric (≤ 15 years)	The algorithm flow through the CPG has been modified **Deleted** IV access – decision diamond Indication for Glucagon for < 1 year **Added** 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)' An advisory box: 'Check for presence of an insulin pump; turn off or remove if present'
CPG 5/6.7.33 Seizure/Convulsion – Paediatric (≤ 15 years)	**Deleted** IV access (yes/no) – decision diamond **Medication updates** Benzodiazepine - maximum 4 doses regardless of route Consider medical advice if more than 4 doses indicated Buccal Midazolam dose for < 1 year divided into < 3 months and ≥ 3 month groups

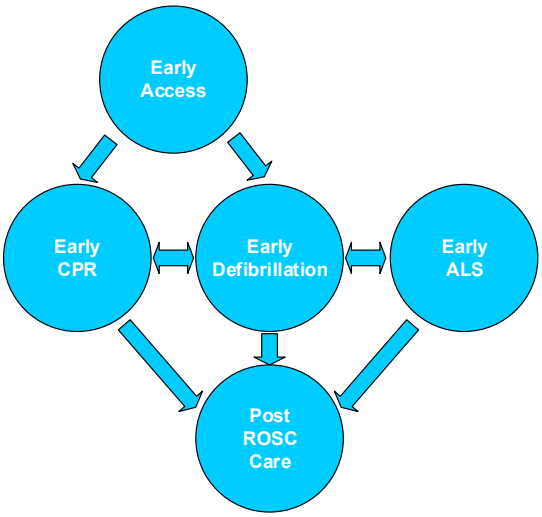
APPENDIX 4 - CPG Updates for Advanced Paramedics

CPGs	The principal differences are:
CPG 5/6.7.34 Septic Shock – Paediatric (≤ 15 years)	**Deleted** Benzylpenicillin Commence with 100% O_2 **Added** 'advise triage nurse if SIRS + infection' 'On immune-suppressant medication' – Could this be severe infection? 'BP monitoring' O_2 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 **Medication updates** 38.5°C new temperature for consideration for Paracetamol NaCl 0.9% 20 mL/Kg IV/IO repeat prn **New Medications** Ceftriaxone (age specific dose) IV/IO/IM Paracetamol (age specific dose) PO/PR/IV
CPG 4/5/6.7.35 Pyrexia – Paediatric	**Deleted** Temperature ≥ 38°C – decision diamond **Added** Temperature > 38.5°C – decision diamond
CPG 4/5/6.7.50 External Haemorrhage – Paediatric (≤ 15 years)	**Added** 'Consider wound closure clips for temporary closure if still bleeding' – AP, P & EMT-BTEC level

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 Advanced Paramedics, and health care professionals whose scope of practice permits, should use defibrillators in manual mode for all age groups.

   1.2 Paramedics may consider using defibrillators in manual mode for all age groups

   1.3 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.

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

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
- age 2 years or younger incapable of verbal communication,

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 lumber 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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