

Clinical Practice Guidelines - 2017 Edition

EMERGENCY MEDICAL TECHNICIAN



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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FOREWORD

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



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

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

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

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

ACCEPTED ABBREVIATIONS

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

ACCEPTED ABBREVIATIONS Continued

Mean Arterial Pressure	MAP
Milligram	mg
Millilitre	mL
Millimole	mmol
Minute	min
Modified Early Warning Score	MEWS
Motor Vehicle Collision	MVC
Myocardial Infarction	MI
Milliequivalent	mEq
Millimetres of mercury	mmHg
Nasopharyngeal airway	NPA
Nebulised	NEB
Negative decadic logarithm of the H ⁺ 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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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 (\leq) 15 years old, unless specified on the CPG
Infant	A patient between 4 weeks and less than 1 year old, unless specified on the CPG
Neonate	A patient less than 4 weeks old, unless specified on the CPG
Paediatric patient	Any child, infant or neonate

CPGs and the pre-hospital emergency care team

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

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

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

IMPLEMENTATION Continued

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

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

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

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

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

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

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

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

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

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

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

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

First Aid Response

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

IMPLEMENTATION Continued

Defibrillation Policy

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

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

Pre-Hospital Spinal Injury Management







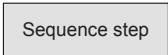

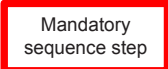

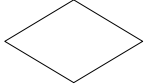


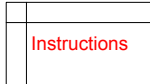
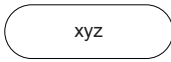


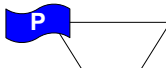




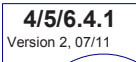

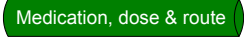
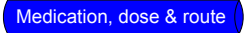



The Medical Advisory Committee has recommended that 'spinal motion restriction' shall be used as the preferred terminology in relation to pre-hospital spinal injury management. They further recommend that at paramedic and advanced paramedic levels a 'spinal injury rule in' should apply and not actively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

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CLINICAL PRACTICE GUIDELINES for EMERGENCY MEDICAL TECHNICIAN

(CODES EXPLANATION)

	Emergency Medical Technician (Level 4) for which the CPG pertains		An EMT who has completed Basic Tactical Emergency Care training and has been privileged to operate in adverse conditions
	Paramedic (Level 5) for which the CPG pertains		A parallel process Which may be carried out in parallel with other sequence steps
	Advanced Paramedic (Level 6) for which the CPG pertains		A cyclical process in which a number of sequence steps are completed
	A sequence (skill) to be performed		Emergency Medical Technician or lower clinical levels not permitted this route
	A mandatory sequence (skill) to be performed		Transport to an appropriate medical facility and maintain treatment en-route
	A decision process The Practitioner must follow one route		Transport to an appropriate medical facility and maintain treatment en-route, if having contacted Ambulance Control there is no ALS available
	Given the clinical presentation consider the treatment option specified		An instruction box for information
	Finding following clinical assessment, leading to treatment modalities		Special instructions Which the Practitioner must follow
	Reassess the patient following intervention		A skill or sequence that only pertains to Paramedic or higher clinical levels
	Contact Ambulance Control and request Advanced Life Support (AP or doctor)		Special authorisation This authorises the Practitioner to perform an intervention under specified conditions
	Consider requesting an ALS response, based on the clinical findings		Consider requesting a Paramedic response or medical support based on the clinical findings
	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		
	A medication which may be administered by an EMT or higher clinical level The medication name, dose and route is specified		
	A medication which may be administered by a Paramedic or higher clinical level The medication name, dose and route is specified		
	A medication which may be administered by an Advanced Paramedic The medication name, dose and route is specified		
	A direction to go to a specific CPG following a decision process Note: only go to the CPGs that pertain to your clinical level		
	A clinical condition that may precipitate entry into the specific CPG		

SECTION 1 – Care Principles (Practitioner)

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

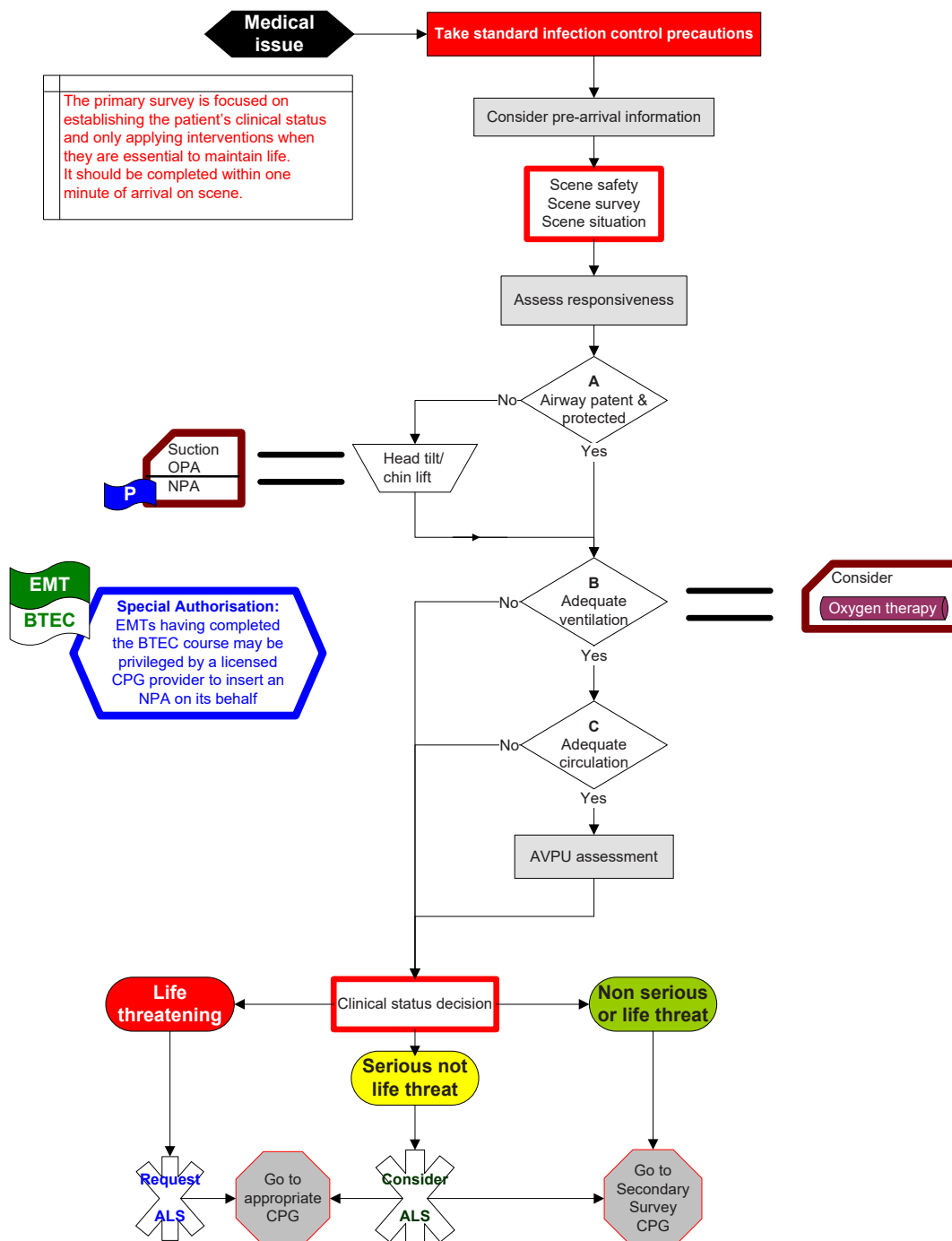
PHECC Care Principles

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

SECTION 2 - Patient Assessment

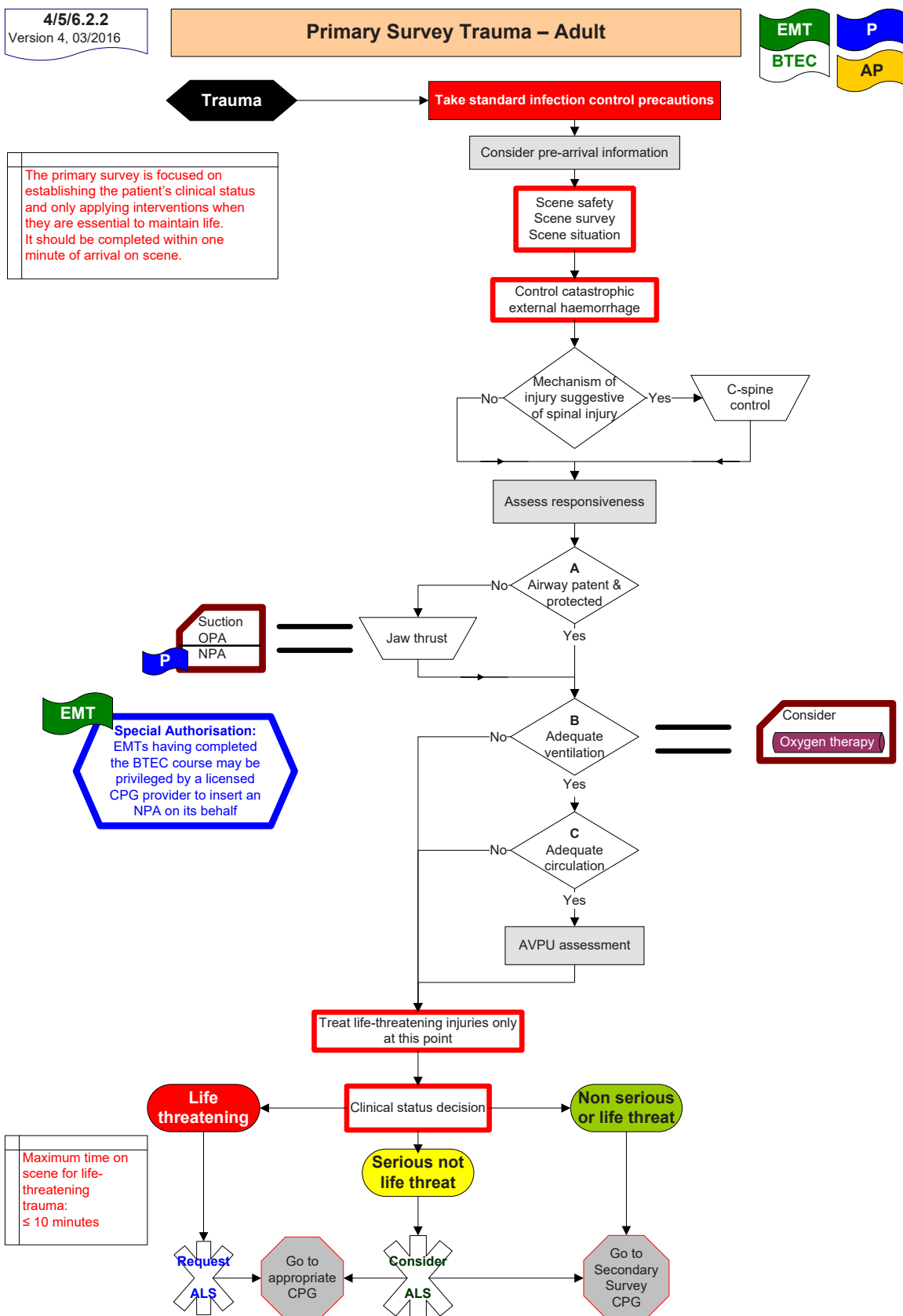
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Primary Survey Medical – Adult



Reference: ILCOR Guidelines 2015

SECTION 2 - Patient Assessment



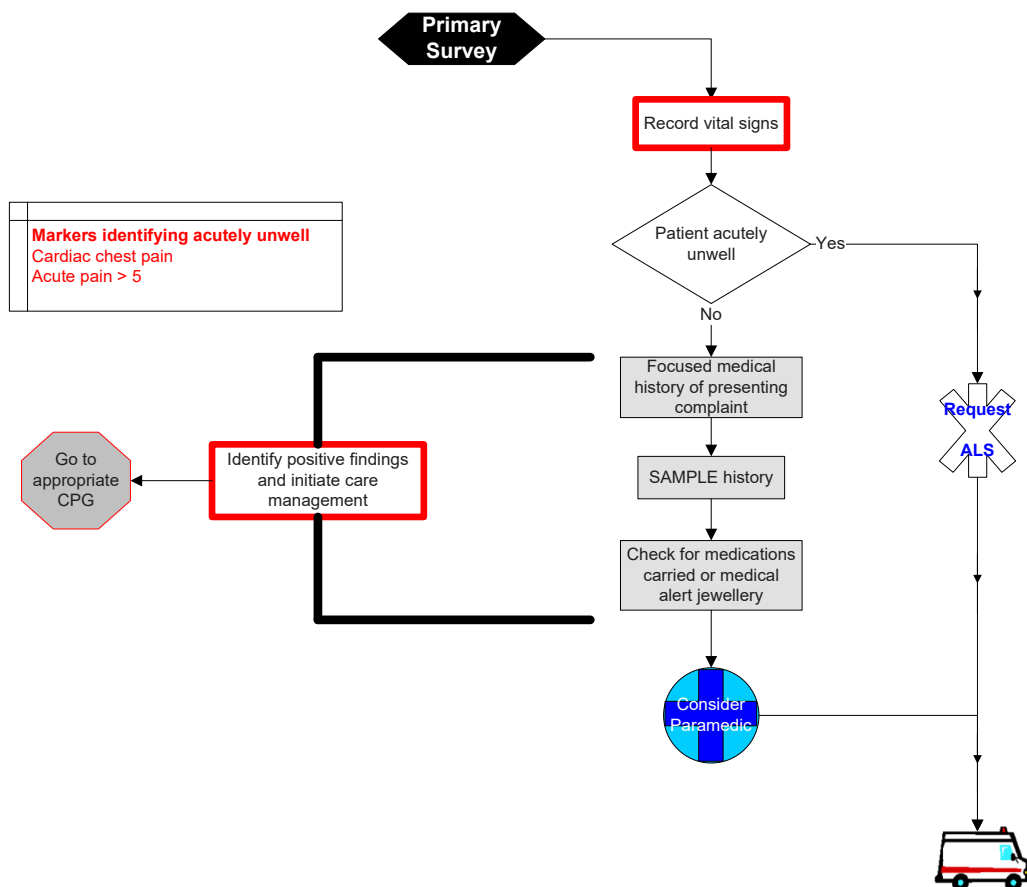
Reference: ILCOR Guidelines 2015

SECTION 2 - Patient Assessment

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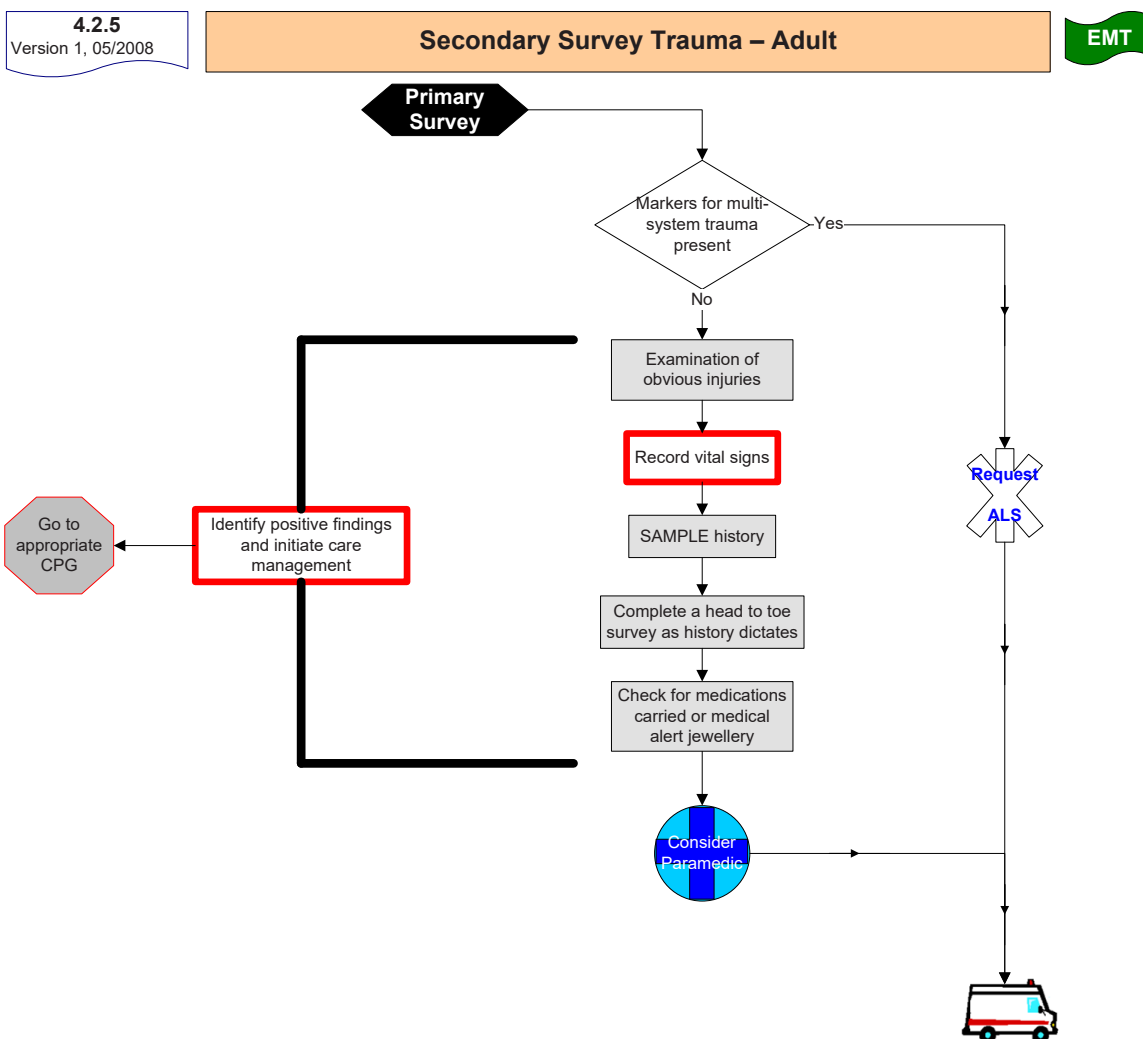
Secondary Survey Medical – Adult

EMT



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

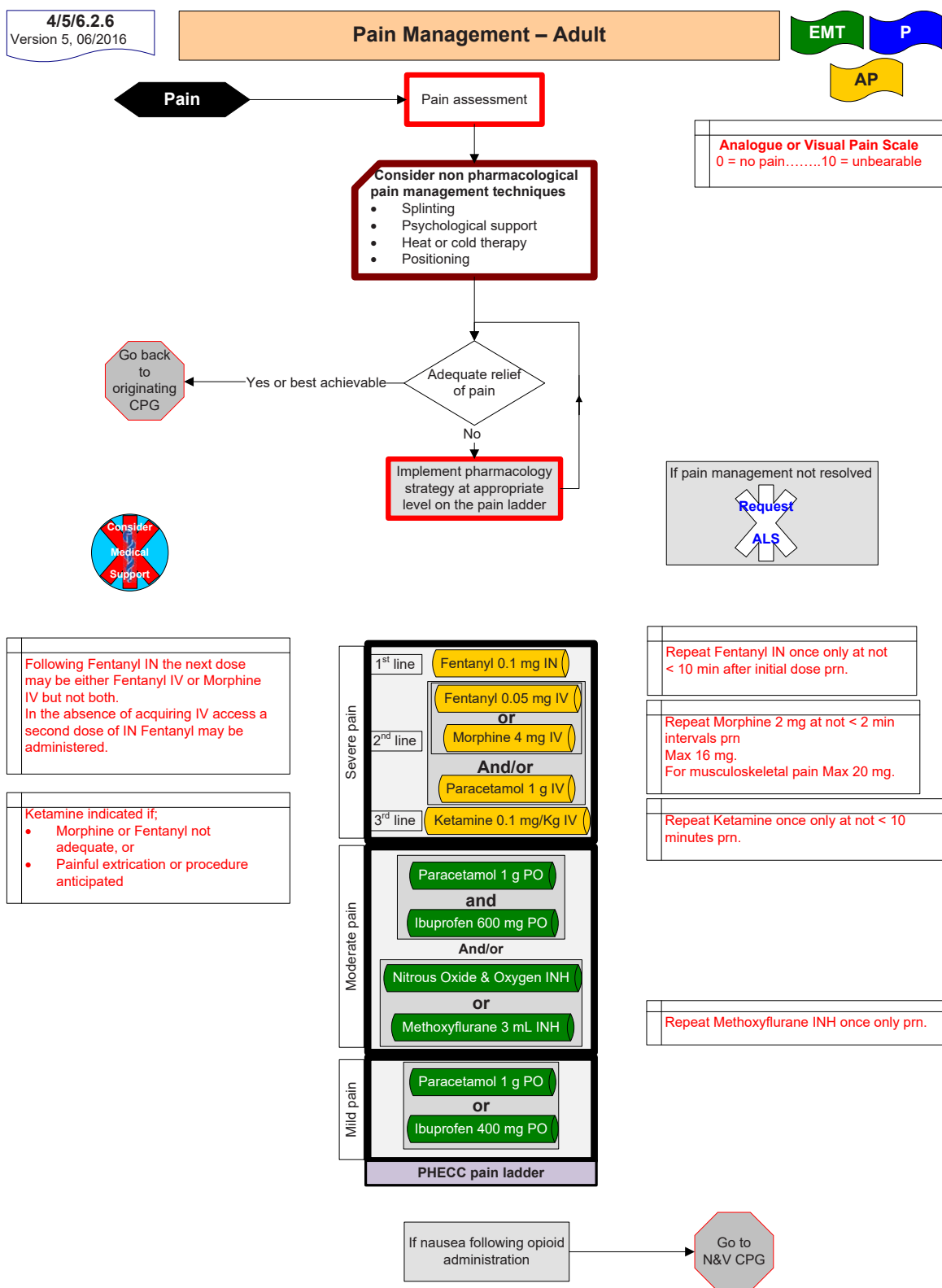
SECTION 2 - Patient Assessment



Markers for multi-system trauma
Systolic BP < 90
Respiratory rate < 10 or > 29
Heart rate > 120
AVPU = V, P or U on scale
Mechanism of Injury

Reference: McSwain, N. et al, 2003, PHTLS Basic and advanced prehospital trauma life support, 5th Edition, Mosby

SECTION 2 - Patient Assessment



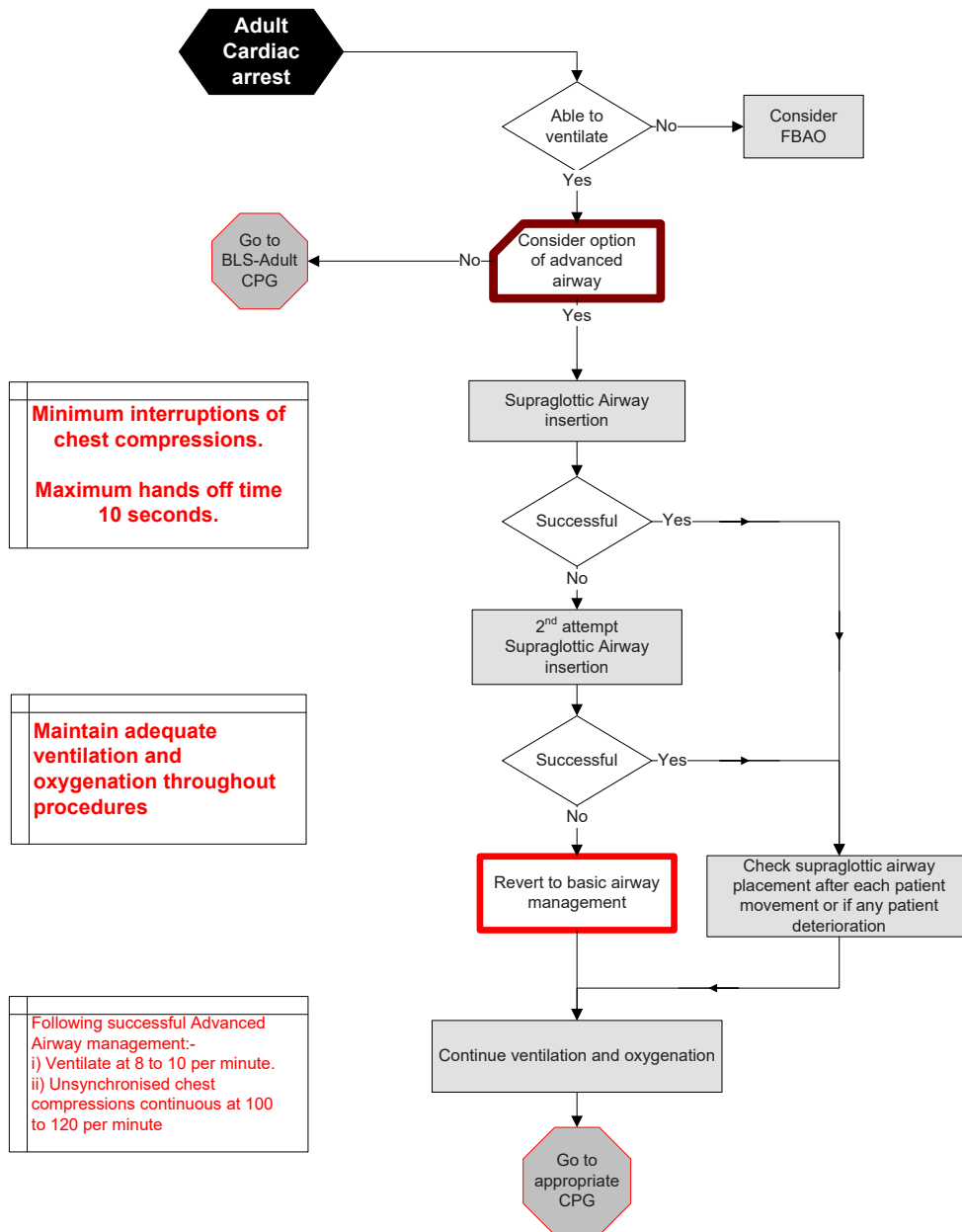
Reference: Coffey, F., et al. (2014). "STOPI: a randomised, double-blind, placebo-controlled study of the efficacy and safety of methoxyflurane for the treatment of acute pain." *Emerg Med J* 31(8): 613-618
 Jennings, P. A., et al. (2011). "Ketamine as an analgesic in the pre-hospital setting: a systematic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

SECTION 3 – Respiratory Emergencies

4.3.1
Version 4, 03/2016

Advanced Airway Management – Adult

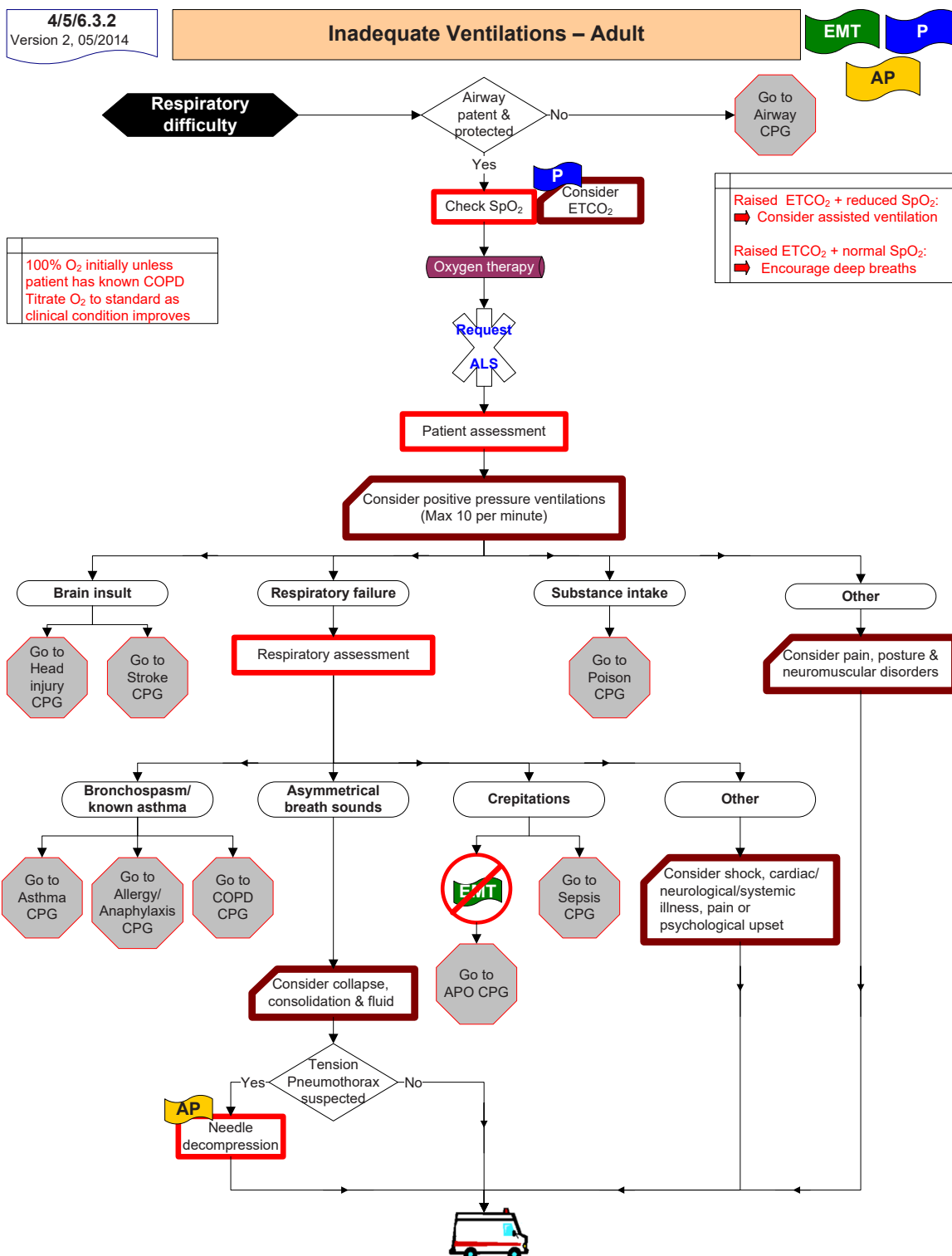
EMT



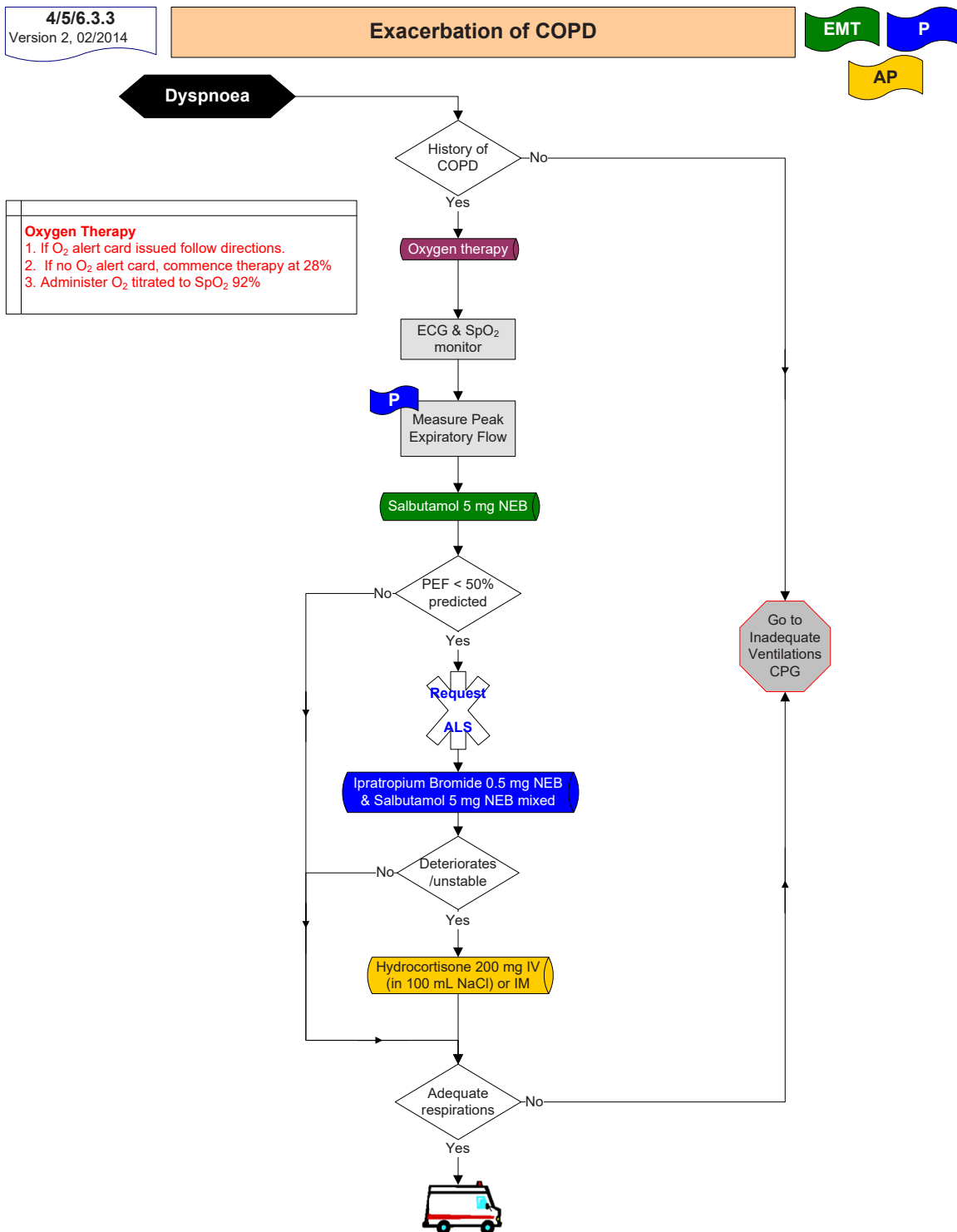
EMT

Special Authorisation:
EMTs may use cuffed supraglottic airways subject to maintaining competence and Medical Director authorisation

SECTION 3 – Respiratory Emergencies

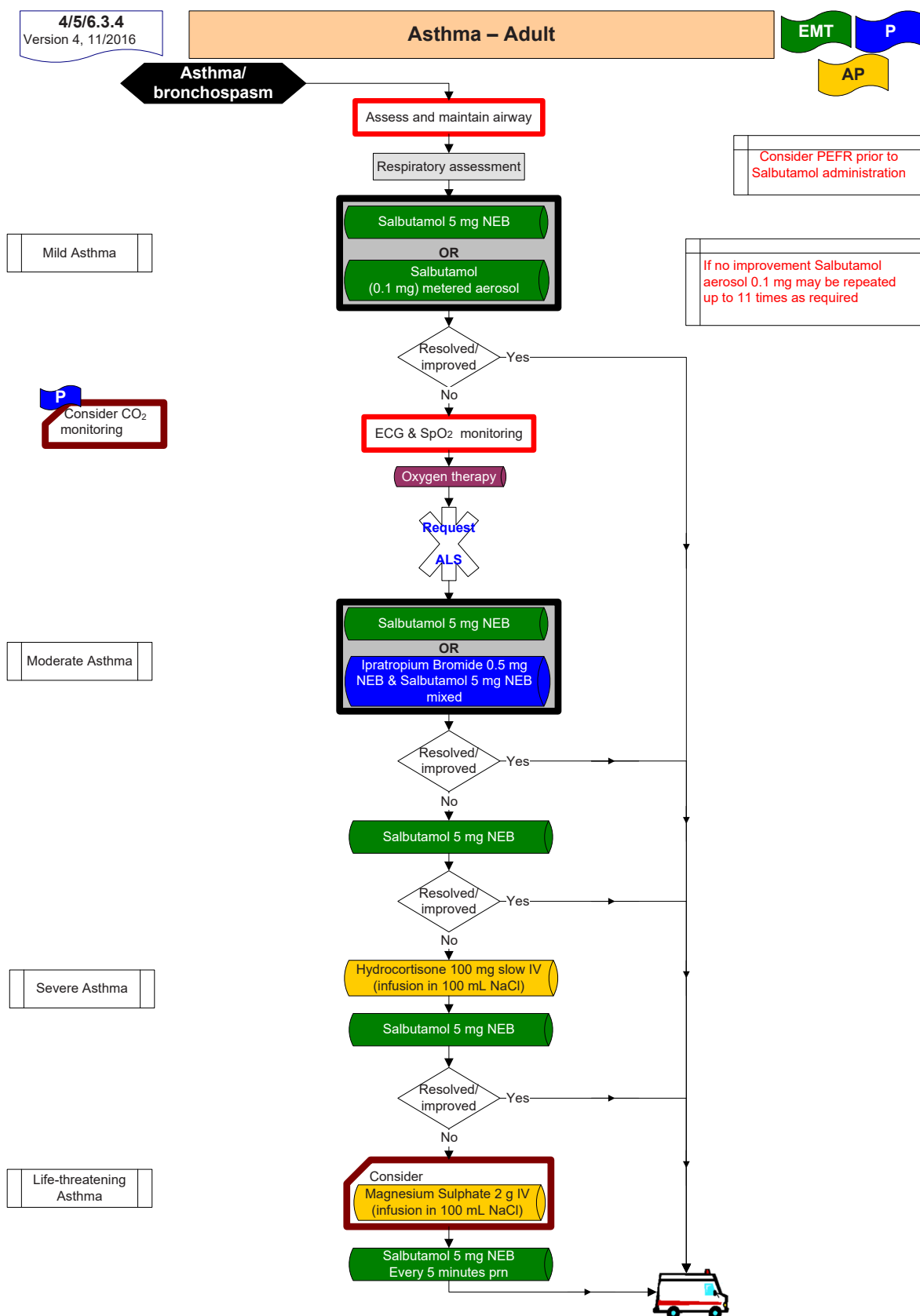


SECTION 3 – Respiratory Emergencies



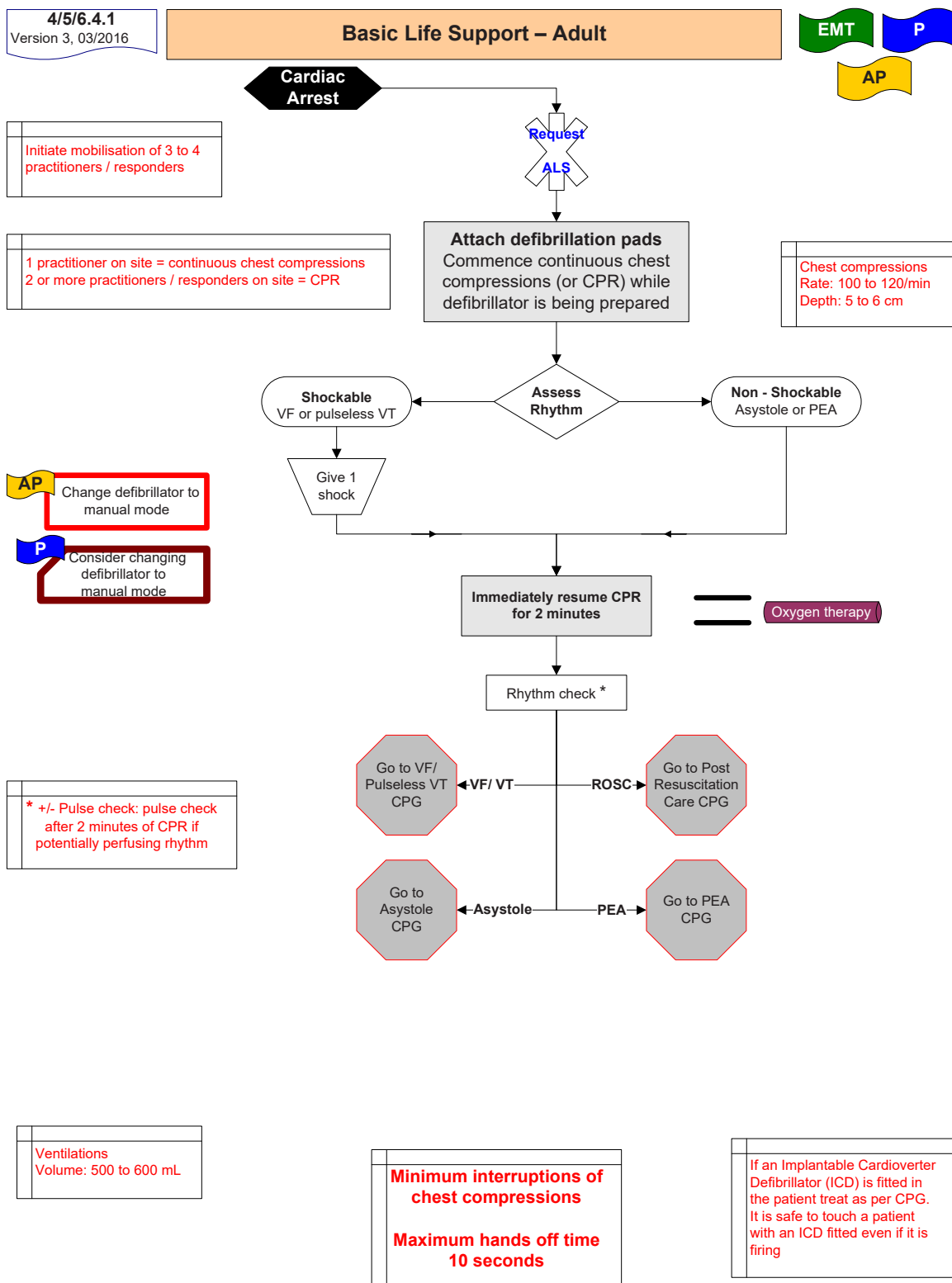
An exacerbation of COPD is defined as;
An event in the natural course of the disease characterised by a change in the patient's baseline dyspnoea, cough and/or sputum beyond day-to-day variability sufficient to warrant a change in management. (European Respiratory Society)

SECTION 3 – Respiratory Emergencies



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

SECTION 4 - Medical Emergencies



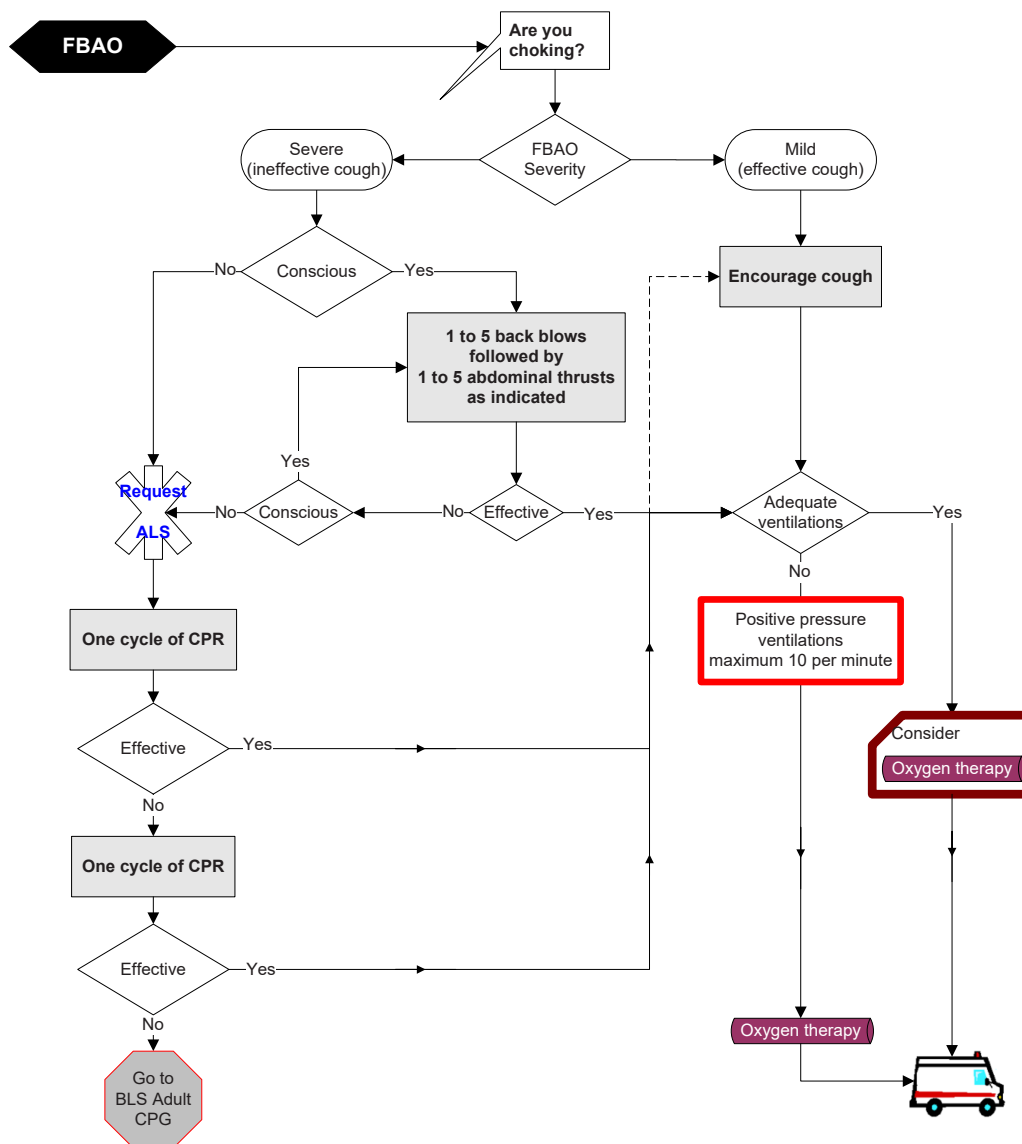
Reference: ILCOR Guidelines 2015

SECTION 4 - Medical Emergencies

4/5.4.2
Version 2, 03/2016

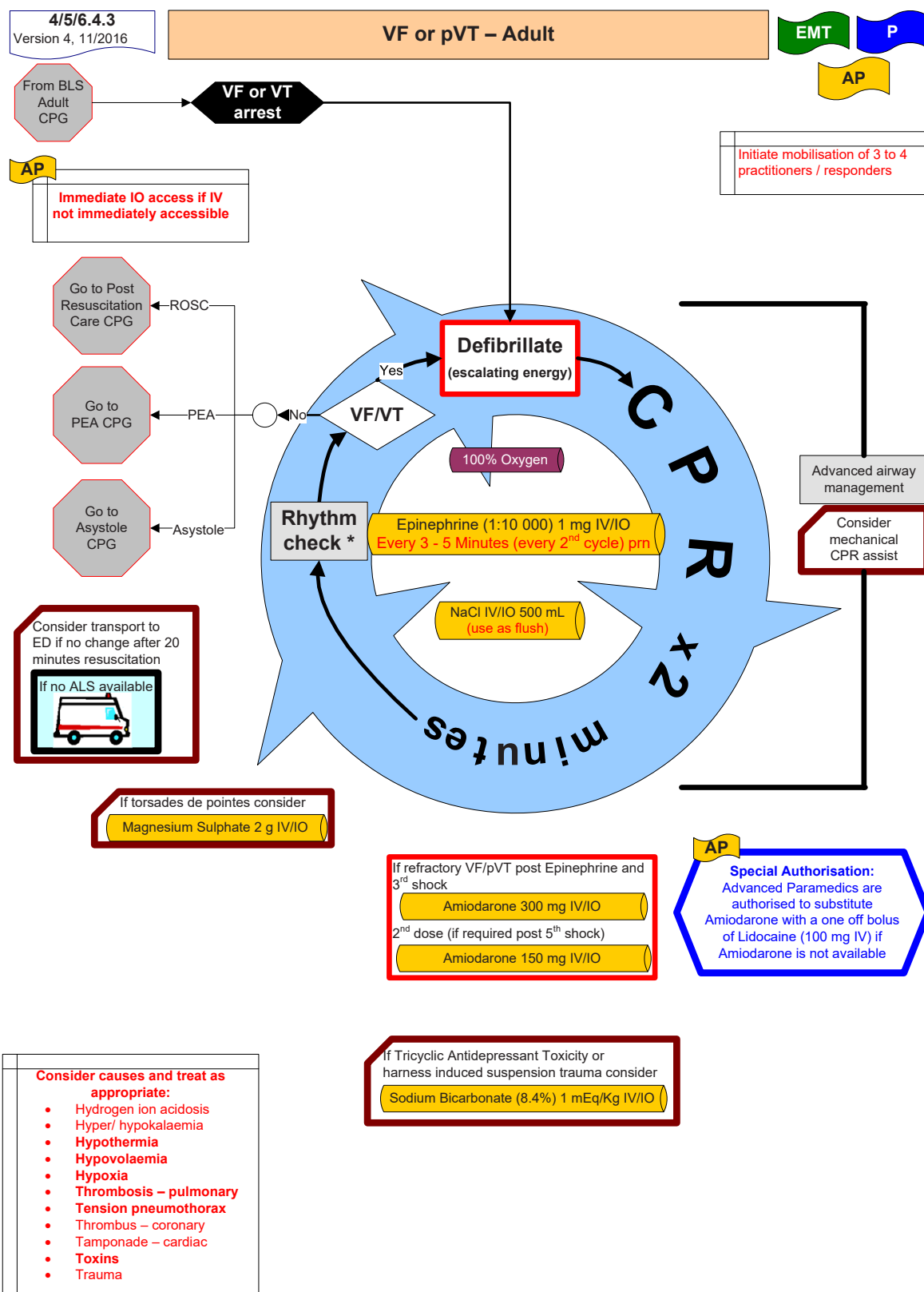
Foreign Body Airway Obstruction – Adult

EMT P



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

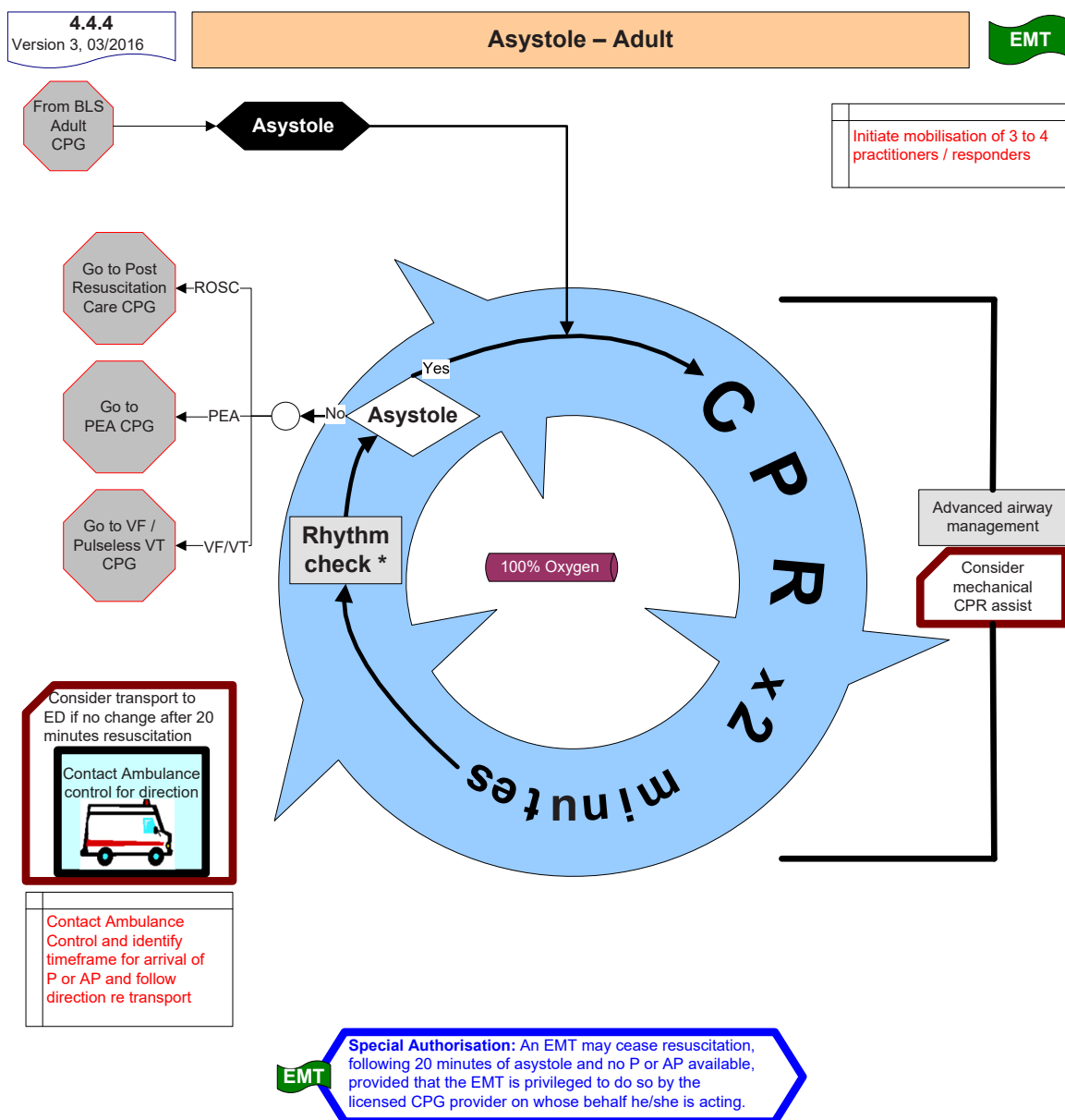
SECTION 4 - Medical Emergencies



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

Reference: ILCOR Guidelines 2015

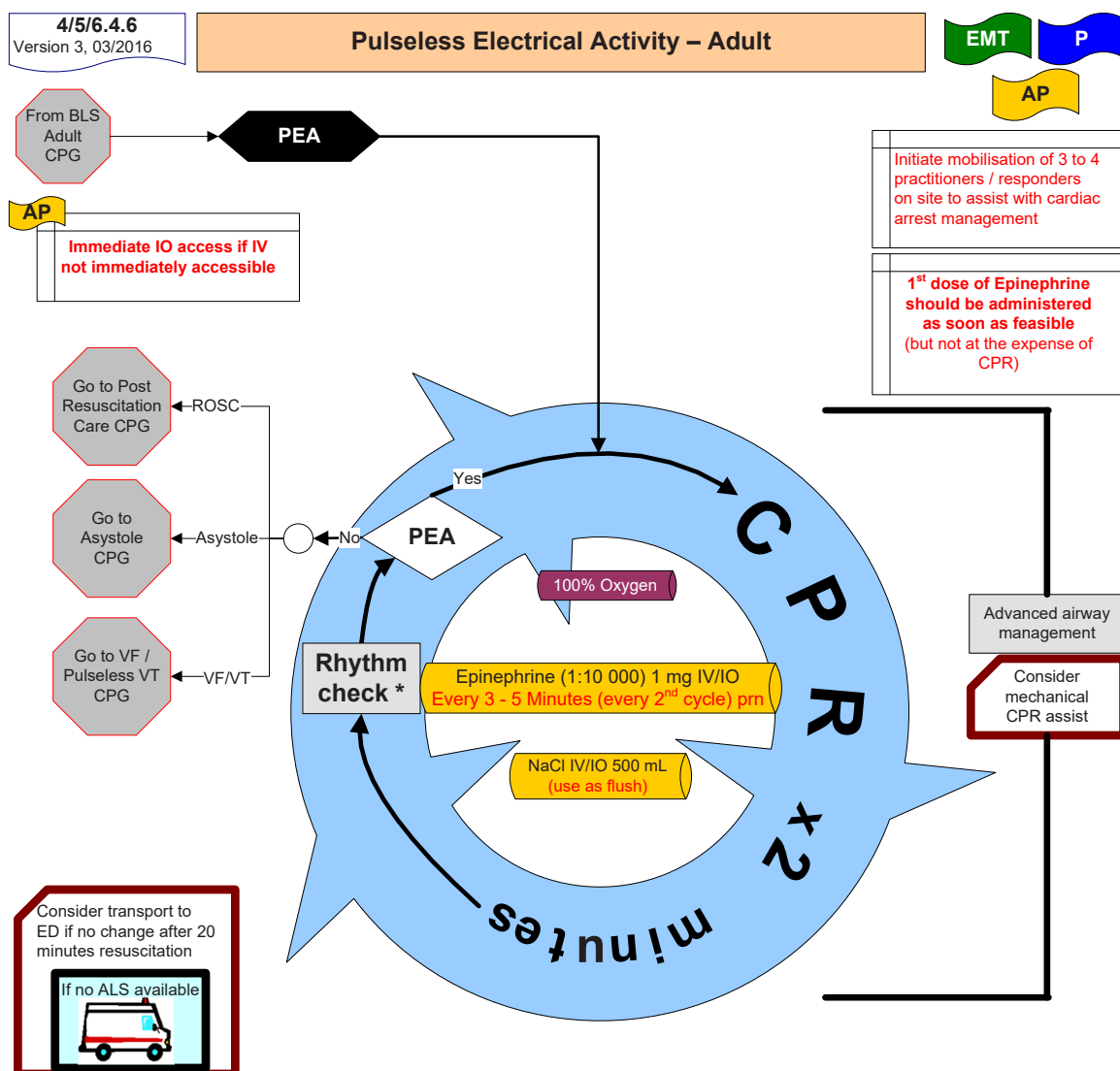
SECTION 4 - Medical Emergencies



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

Reference: ILCOR Guidelines 2015

SECTION 4 - Medical Emergencies



Consider causes and treat as appropriate:

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

Consider fluid challenge

NaCl 1 L IV/IO Repeat prn

If Tricyclic Antidepressant Toxicity or harness induced suspension trauma consider

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

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

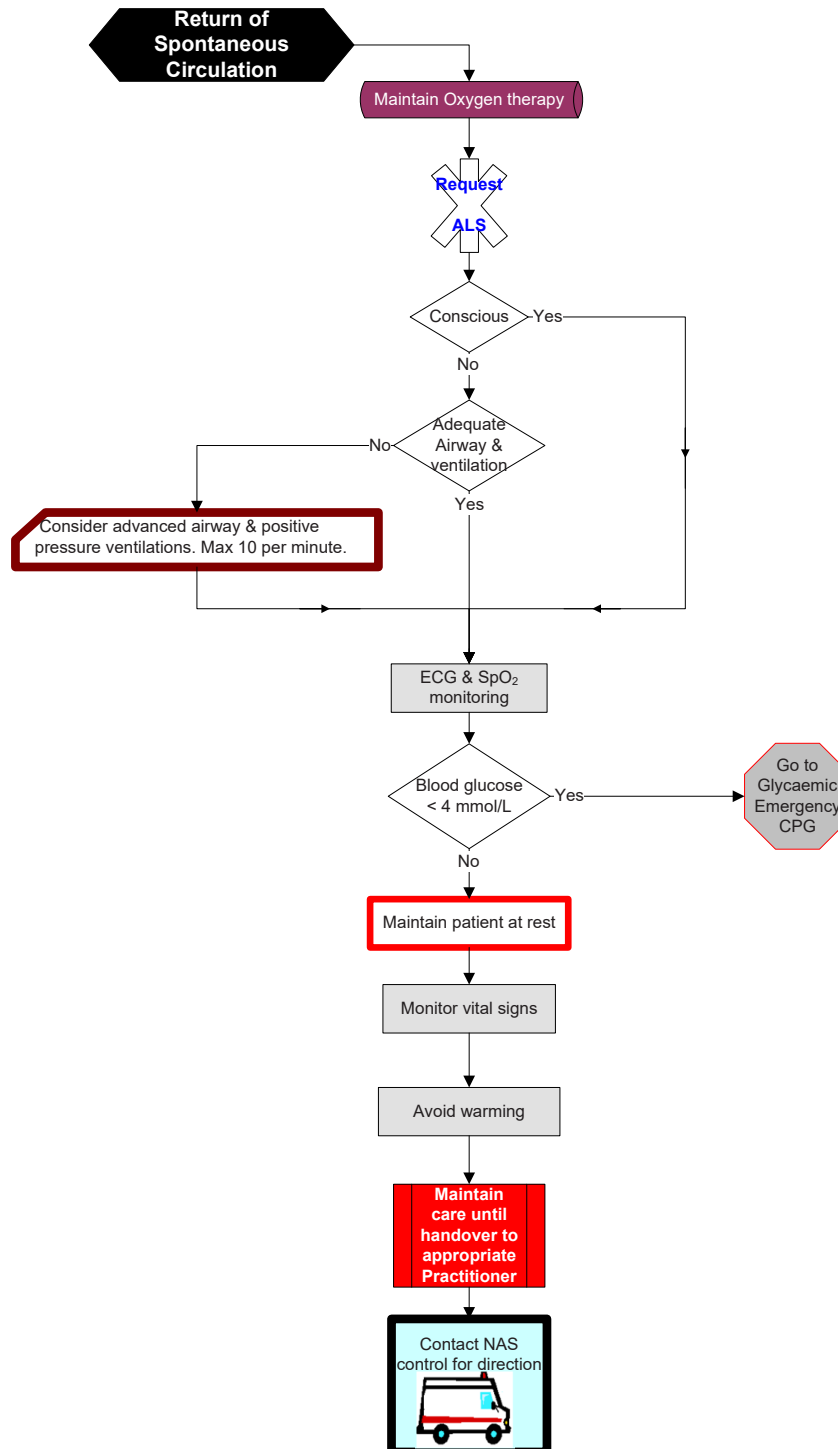
Reference: ILCOR Guidelines 2015

SECTION 4 – Medical Emergencies

4.4.7
Version 3, 03/2016

Post-Resuscitation Care – Adult

EMT

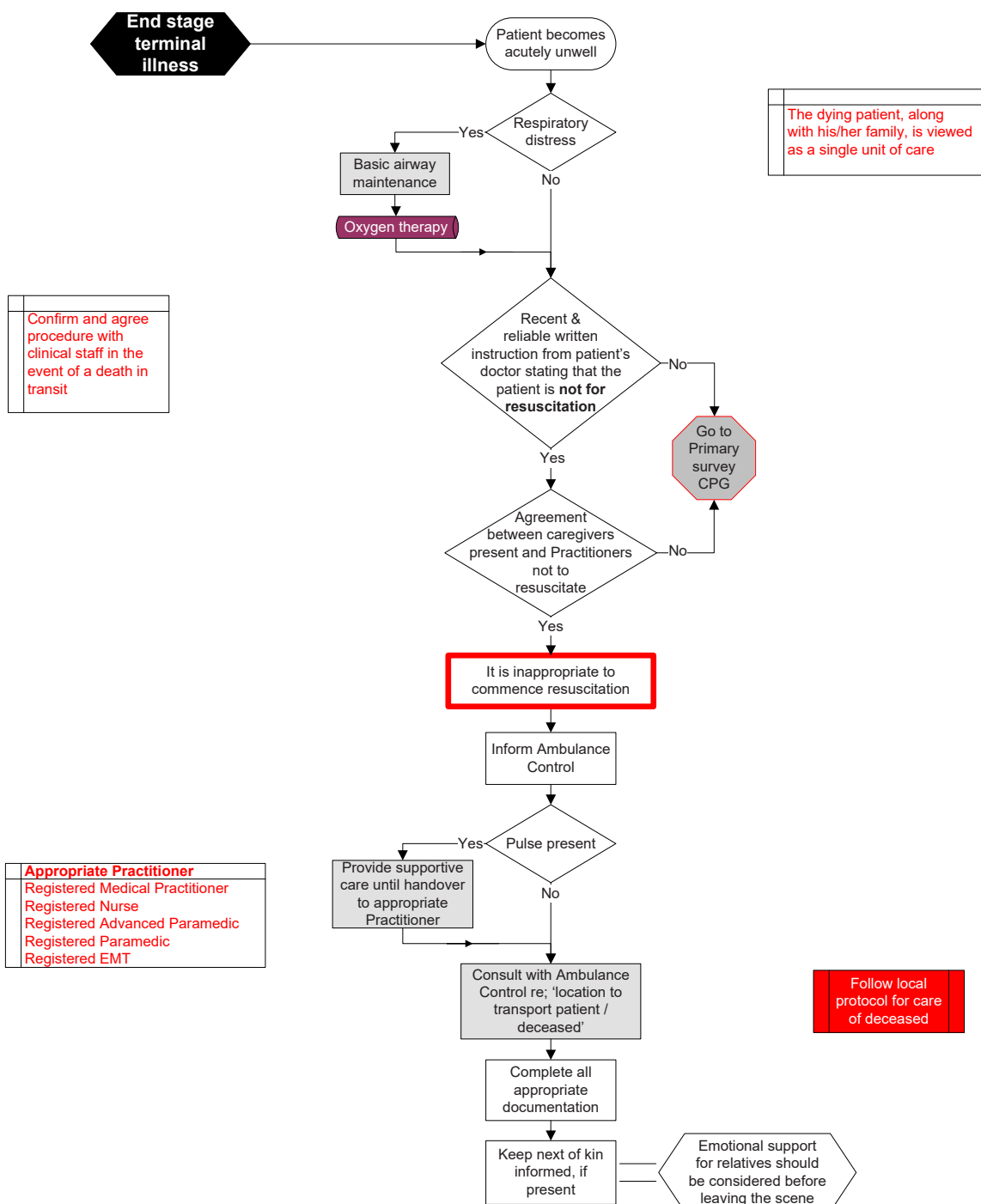


SECTION 4 – Medical Emergencies

4.4.8
Version 1, 06/2010

End of Life – DNR

EMT

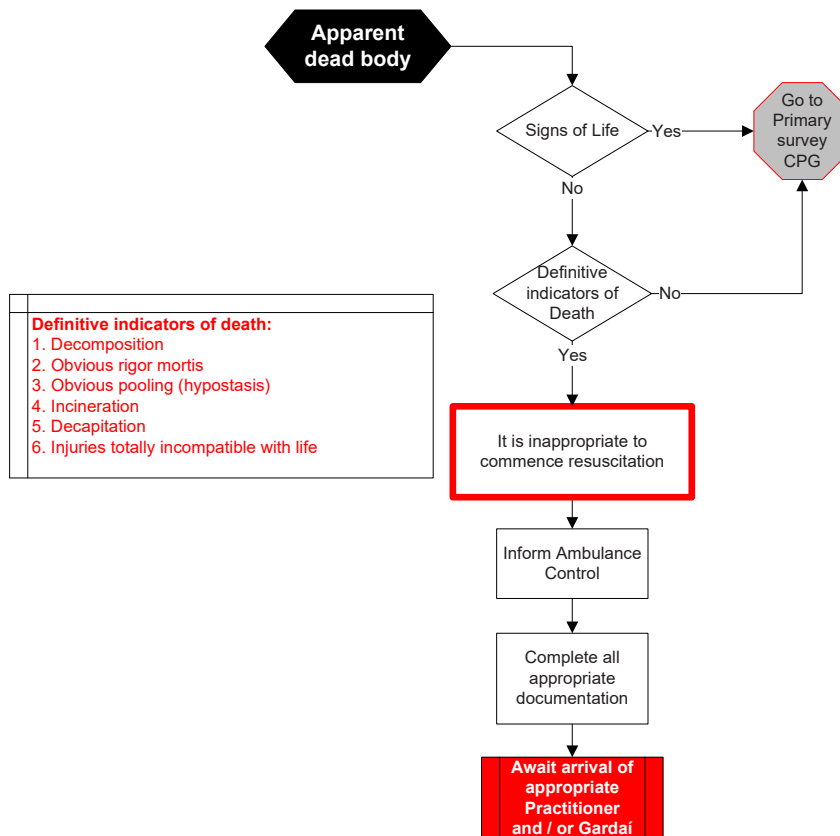


SECTION 4 – Medical Emergencies

4.4.9
Version 1, 05/2008

Recognition of Death – Resuscitation not Indicated

EMT

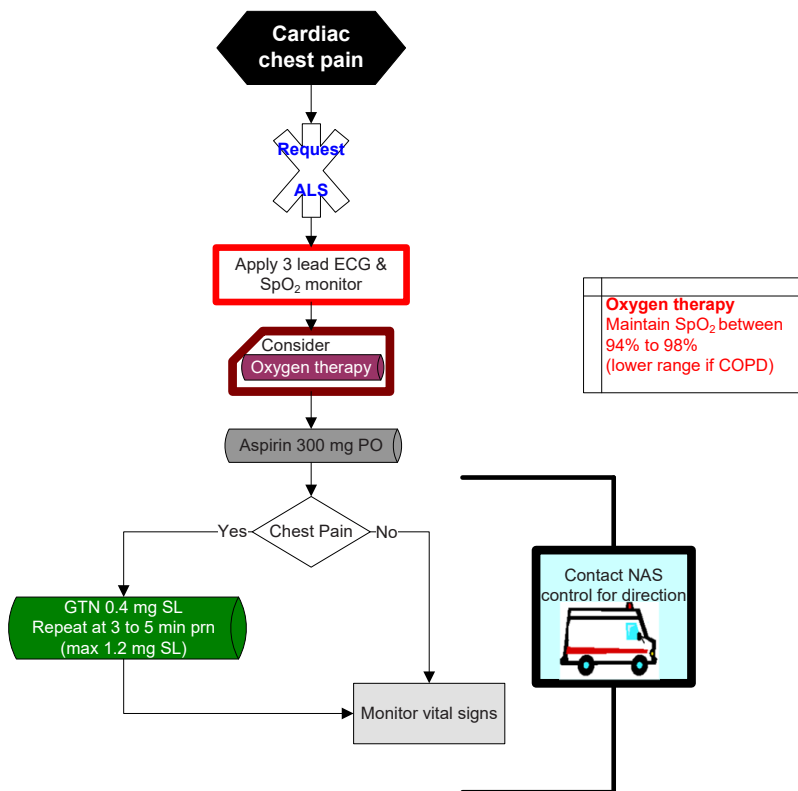


SECTION 4 – Medical Emergencies

4.4.10
Version 3, 03/2016

Cardiac Chest Pain – Acute Coronary Syndrome

EMT

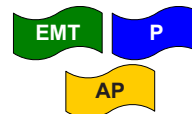


Reference: ILCOR Guidelines 2015

SECTION 4 - Medical Emergencies

4/5/6.4.11
Version 3, 03/2016

Symptomatic Bradycardia – Adult



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

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

Symptomatic Bradycardia

Oxygen therapy

Request
ALS

ECG & SpO₂
monitoring

P

12 lead ECG

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

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

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

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

Reassess

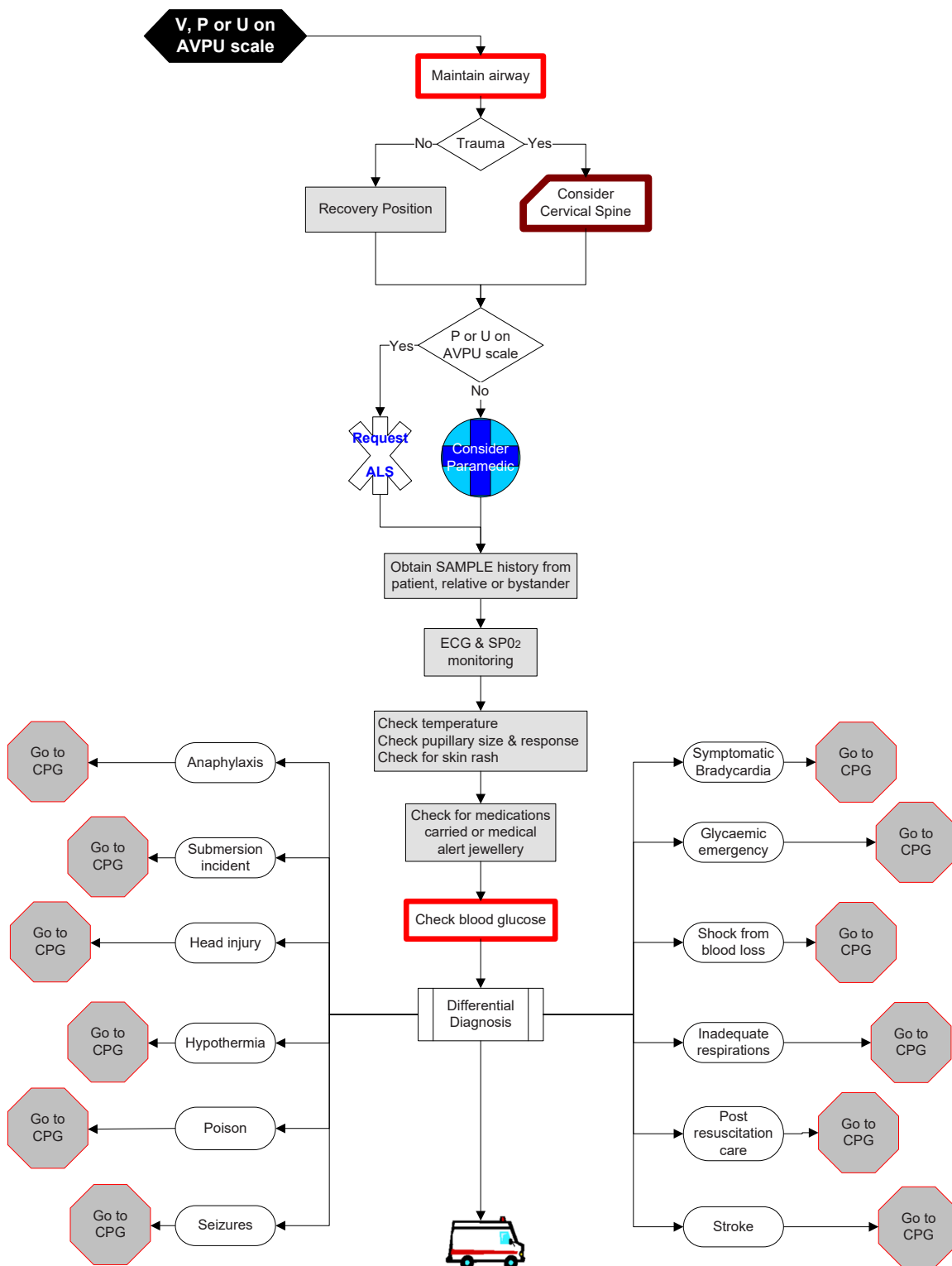


SECTION 4 - Medical Emergencies

4.4.14
Version 1, 05/2008

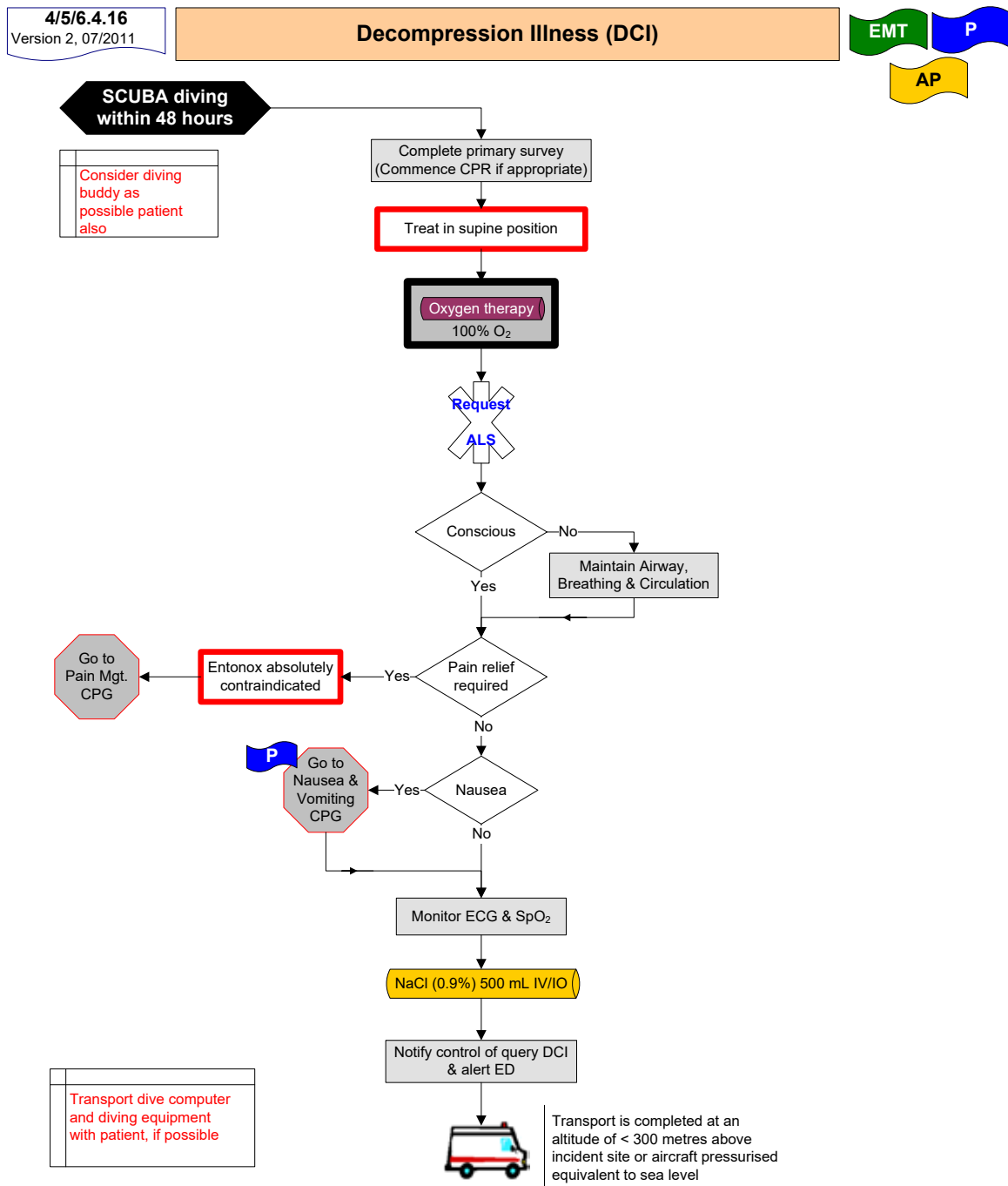
Altered Level of Consciousness – Adult

EMT



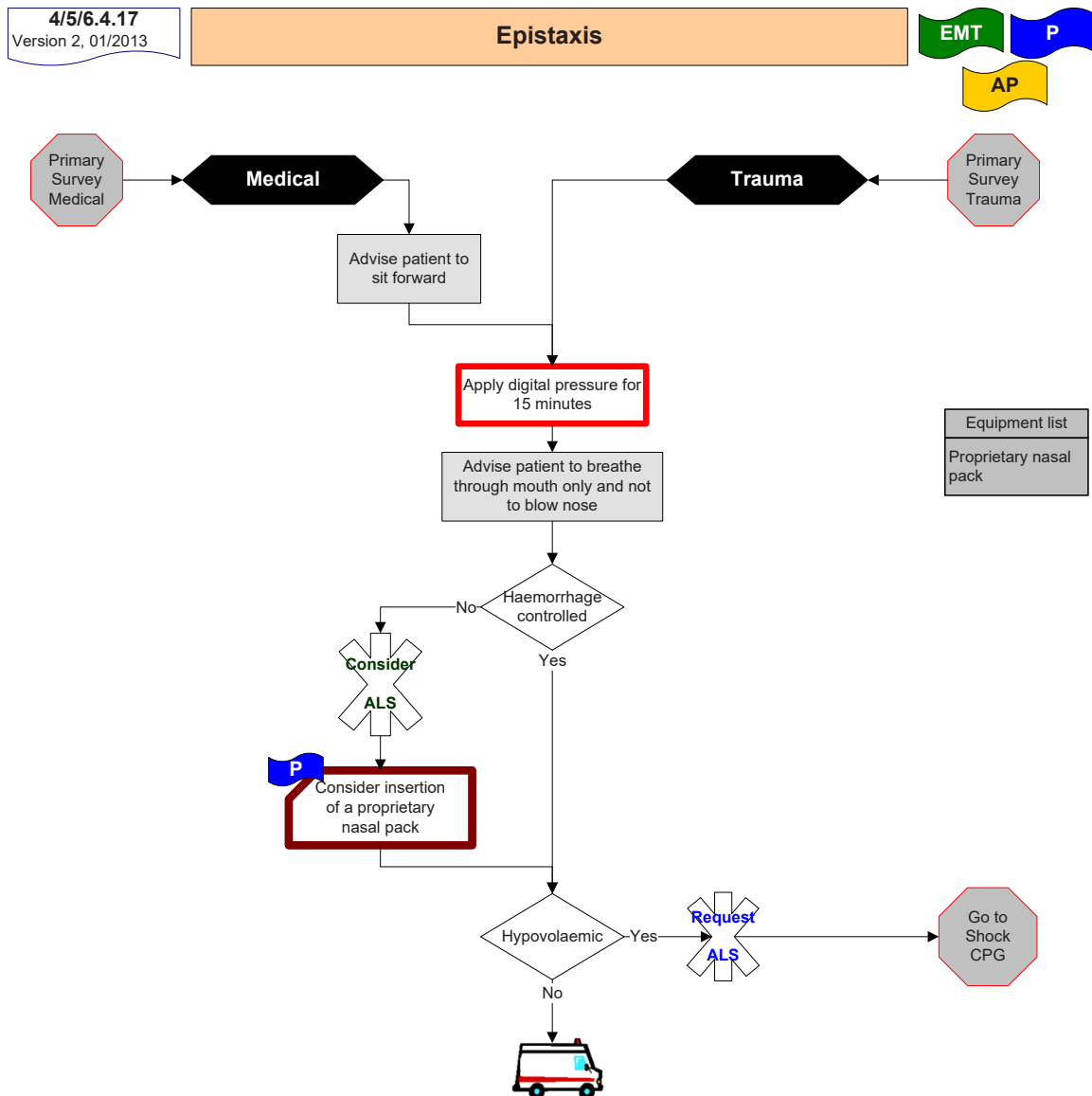


SECTION 4 - Medical Emergencies



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

SECTION 4 - Medical Emergencies

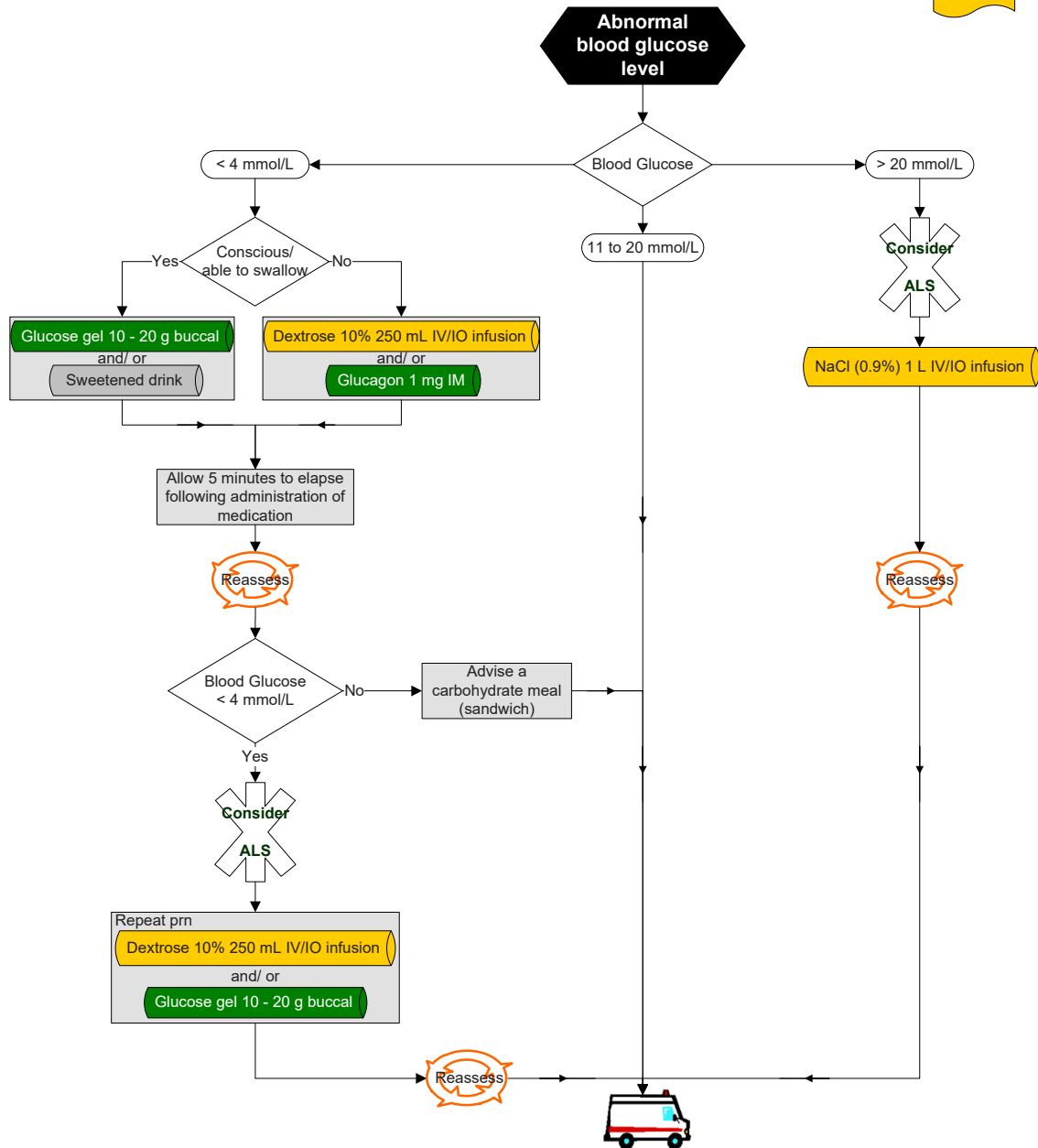
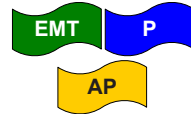


Reference: Management of Acute Epistaxis 2011, Ola Bamimore, MD; Chief Editor: Steven C Dronen, MD, <http://emedicine.medscape.com/article/764719-overview#showall>

SECTION 4 - Medical Emergencies

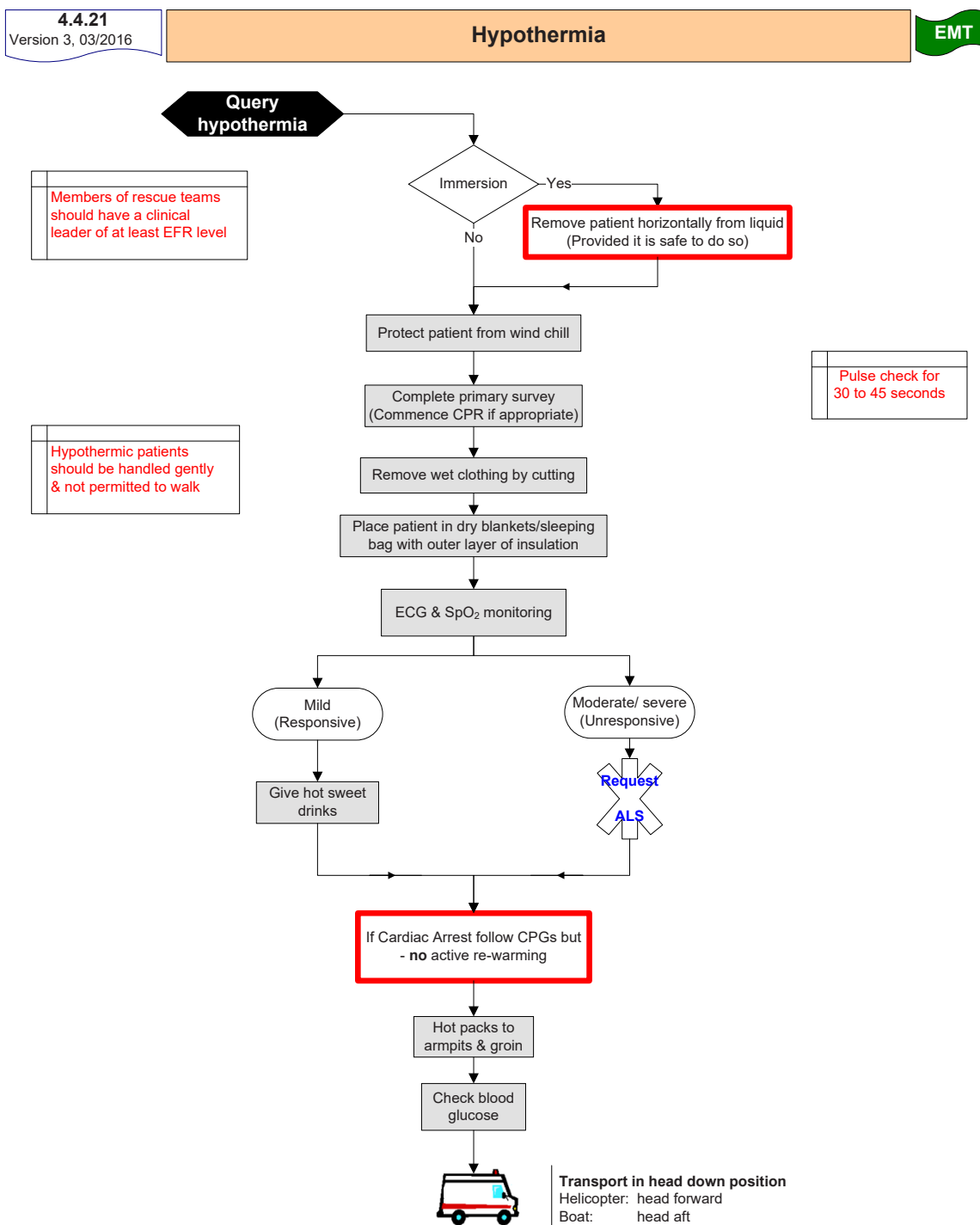
4/5/6.4.19
Version 2, 04/2016

Glycaemic Emergency – Adult



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

SECTION 4 - Medical Emergencies



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

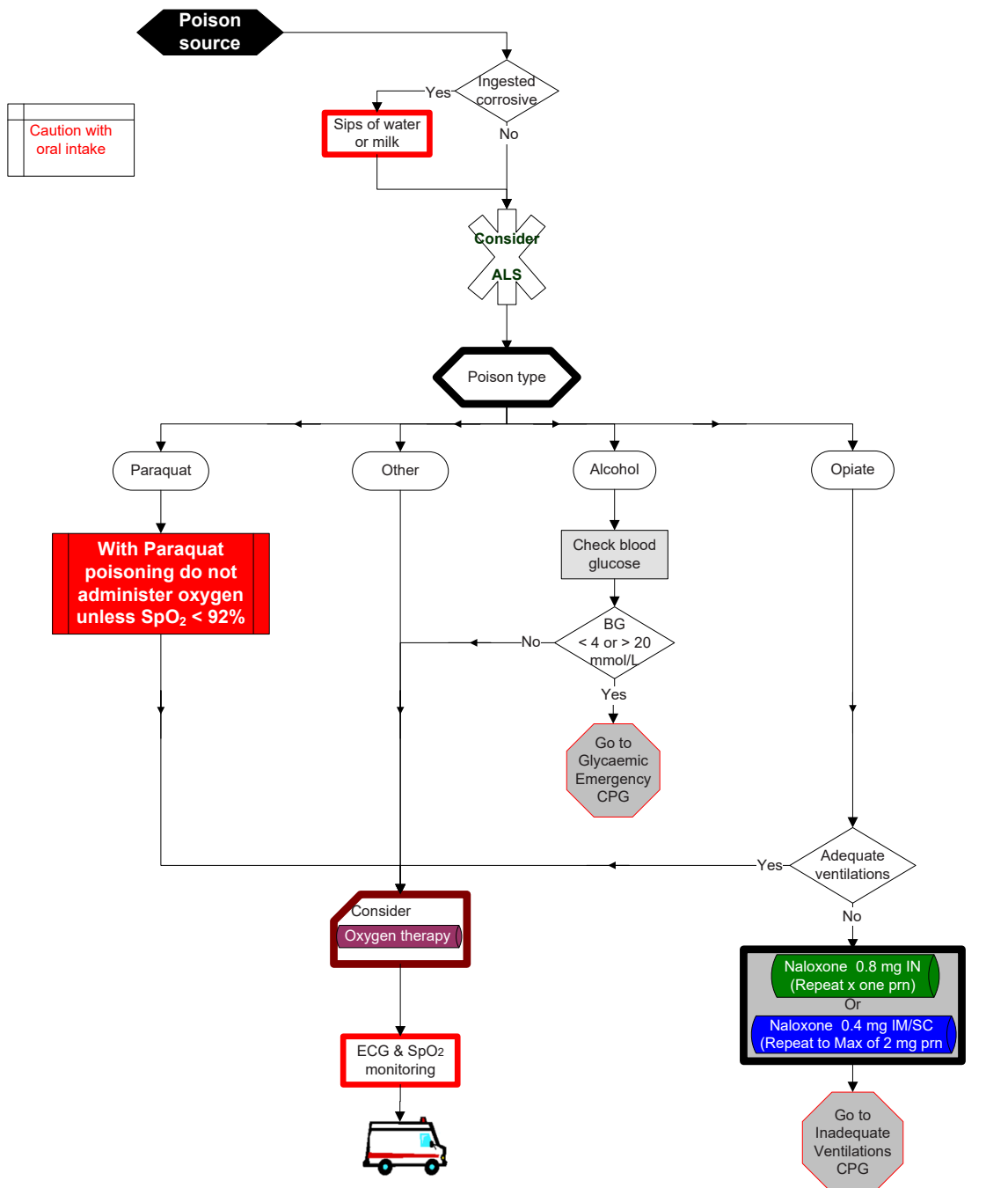
SECTION 4 - Medical Emergencies

4/5.4.22
Version 4, 03/2016

Poisons – Adult

EMT

P



Reference: ILCOR Guidelines 2015

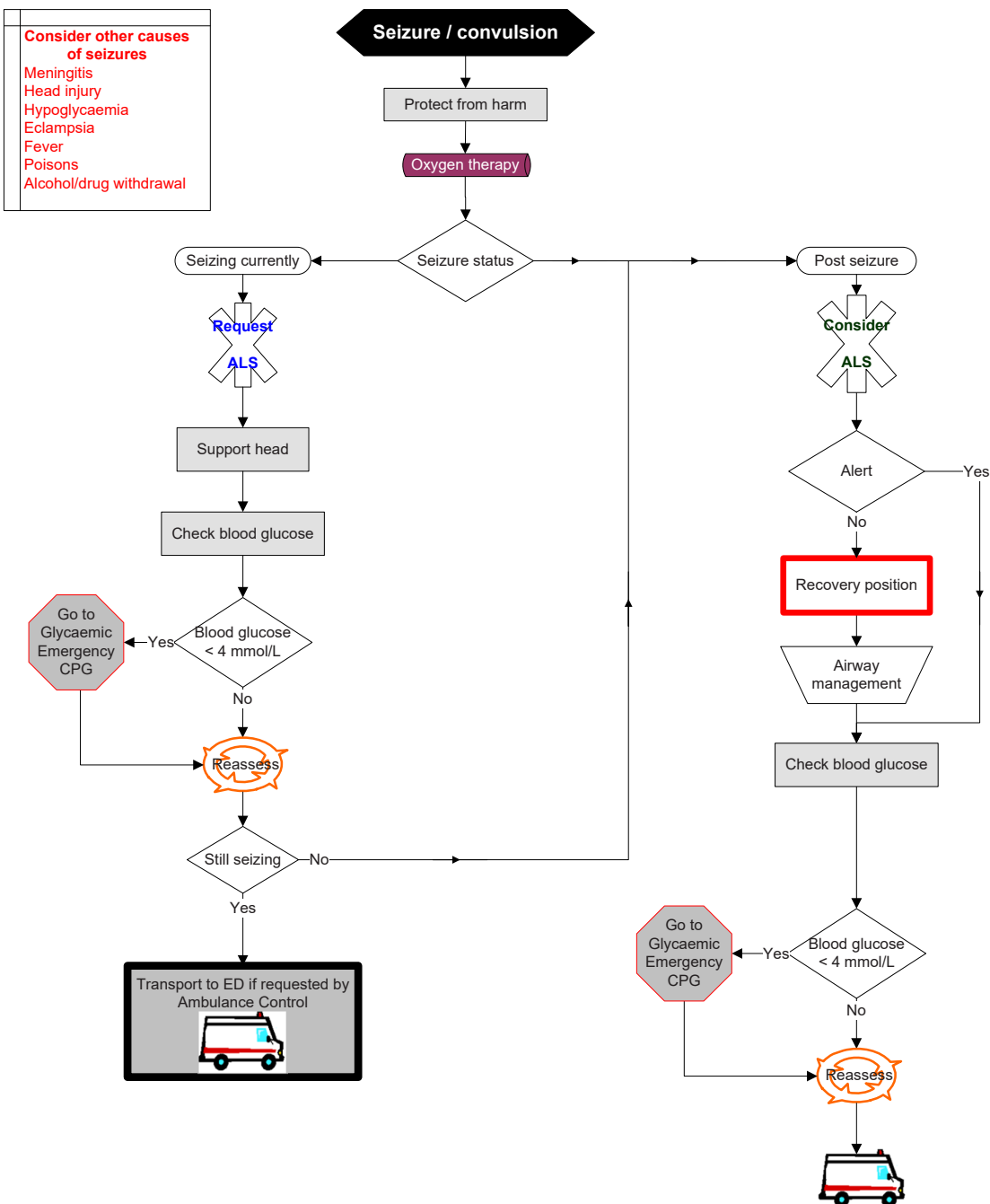
Boyer, E, 2012, Management of Opioid Analgesic Overdose, N Engl J Med 2012;367:146-55.DOI: 10.1056/NEJMra1202561

SECTION 4 - Medical Emergencies

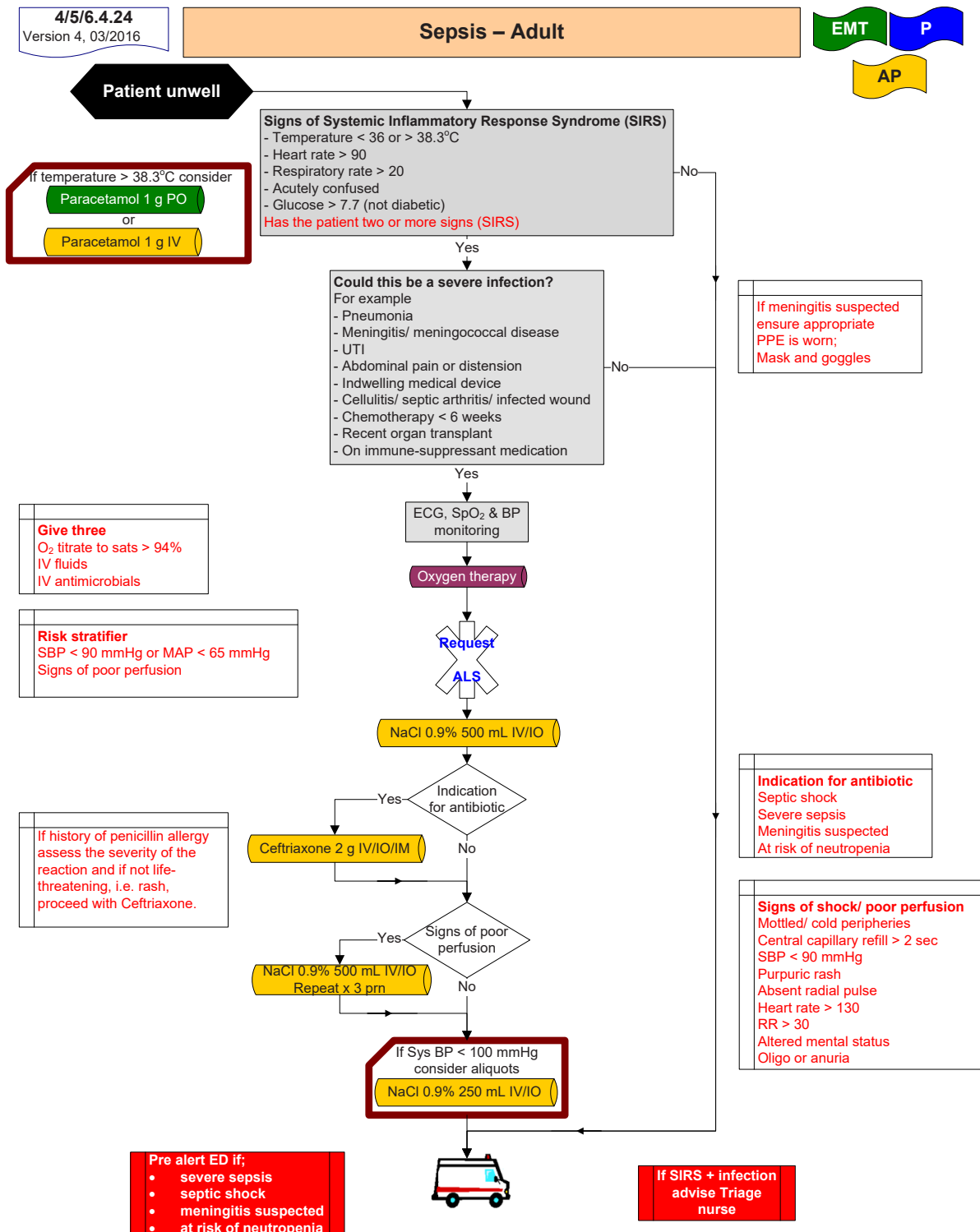
4.4.23
Version 2, 07/11

Seizure/Convulsion – Adult

EMT

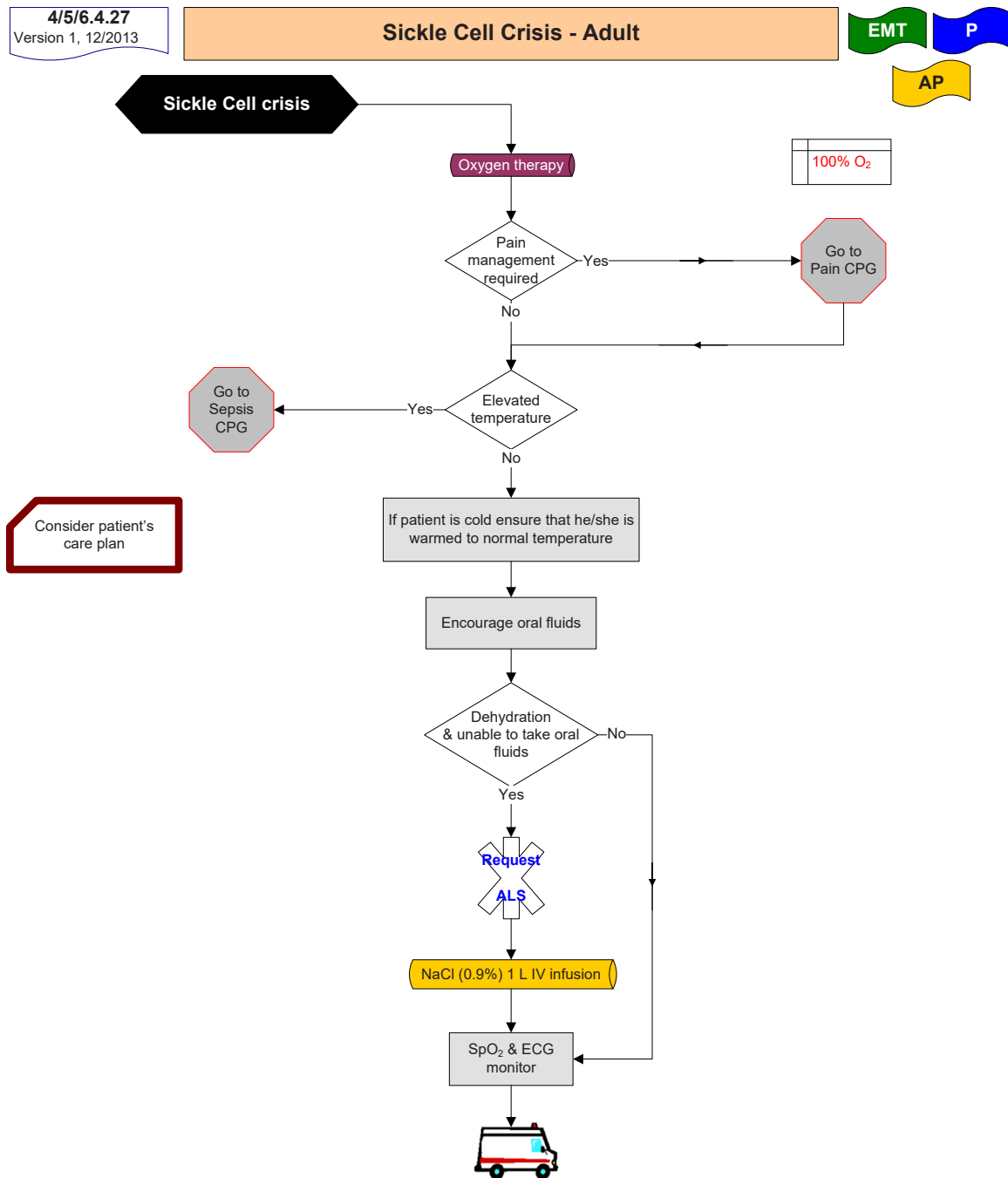


SECTION 4 – Medical Emergencies



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

SECTION 4 - Medical Emergencies



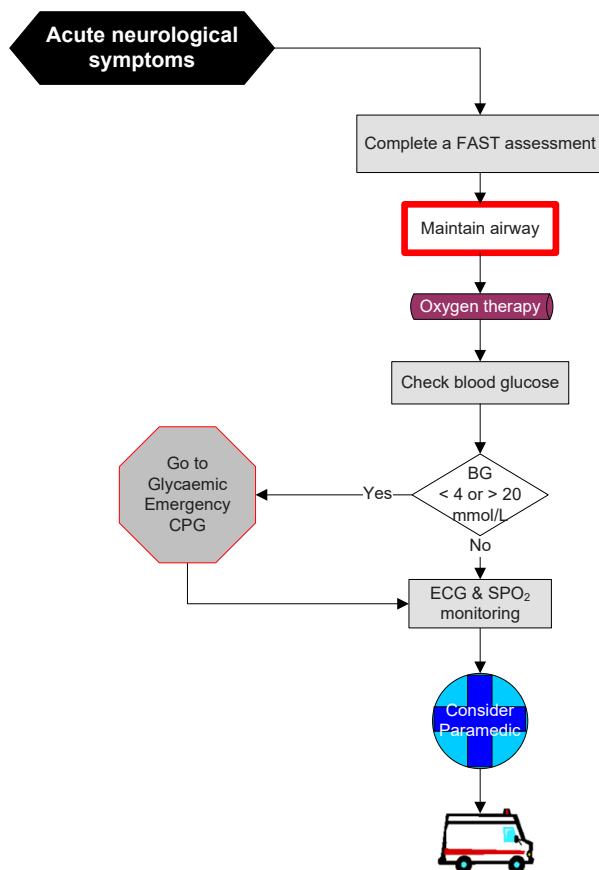
Reference: Rees, D, 2003, GUIDELINES FOR THE MANAGEMENT OF THE ACUTE PAINFUL CRISIS IN SICKLE CELL DISEASE; British Journal of Haematology, 2003, 120, 744–752

SECTION 4 – Medical Emergencies

4.4.28
Version 2, 03/2016

Stroke

EMT



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?

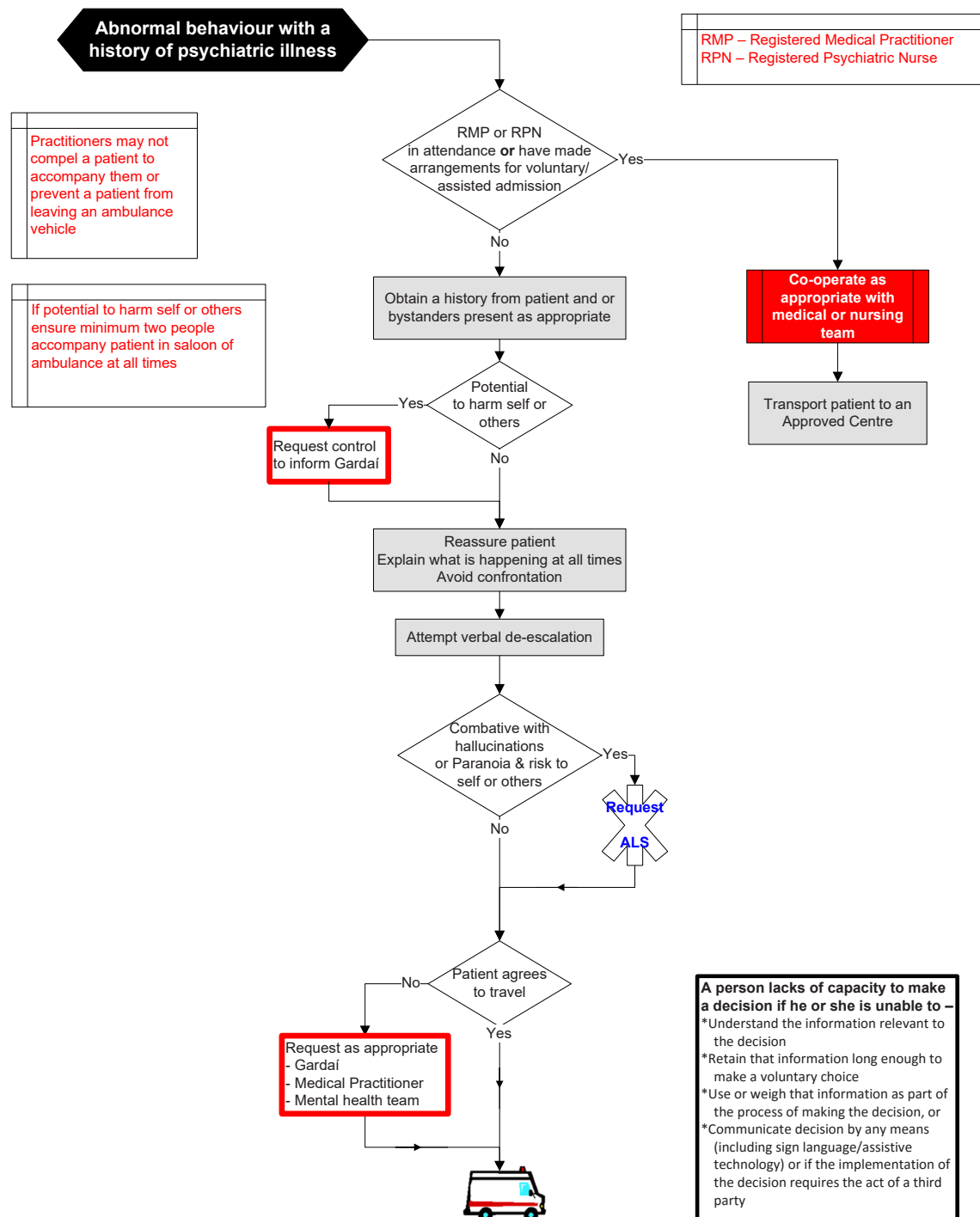
T – time of onset

SECTION 4 – Medical Emergencies

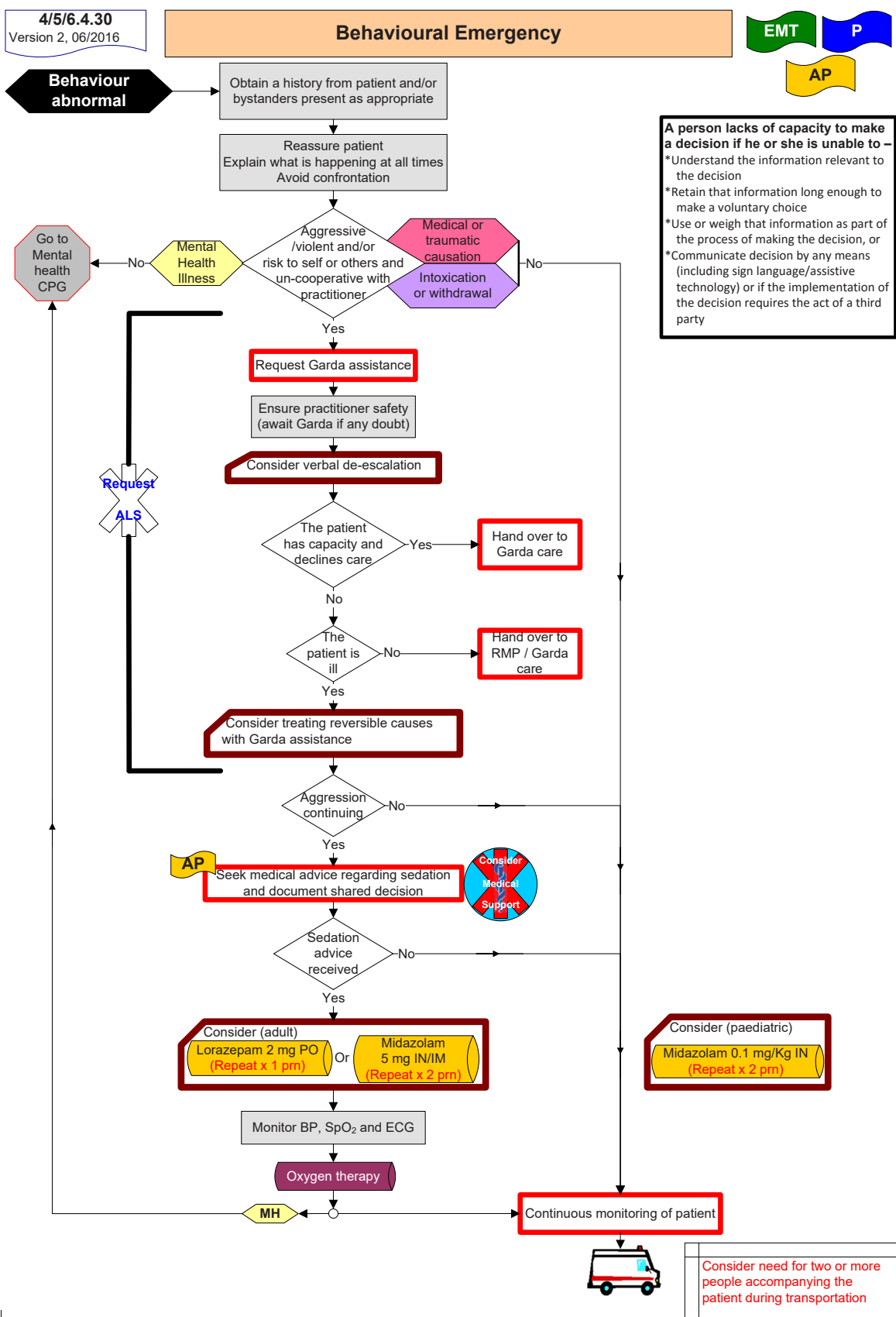
4/5.4.29
Version 2, 04/2016

Mental Health Emergency

EMT P



SECTION 4 - Medical Emergencies



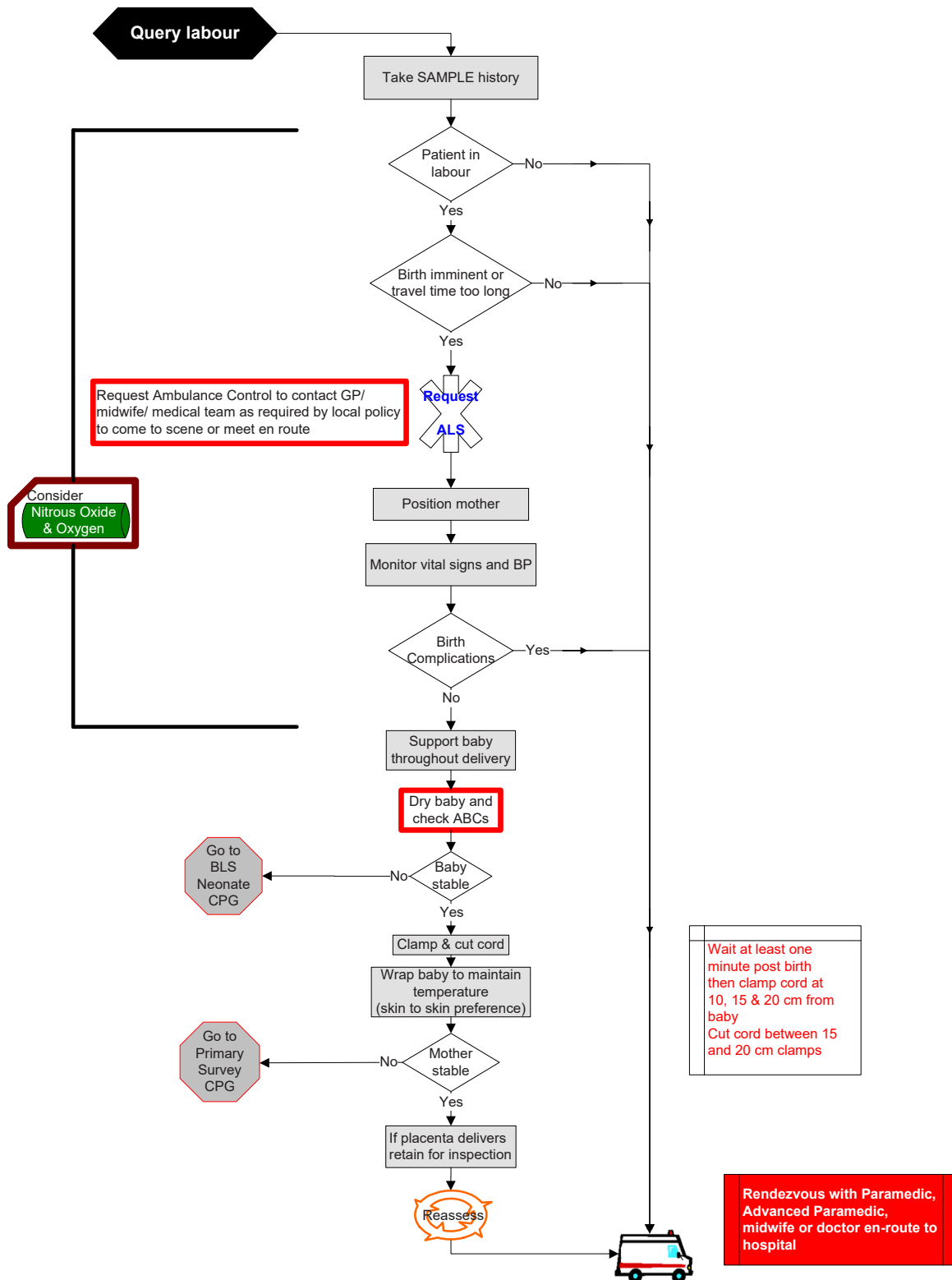
Reference: HSE Mental Health Services
Assisted Decision-Making (Capacity) Act 2015

SECTION 5 - Obstetric Emergencies

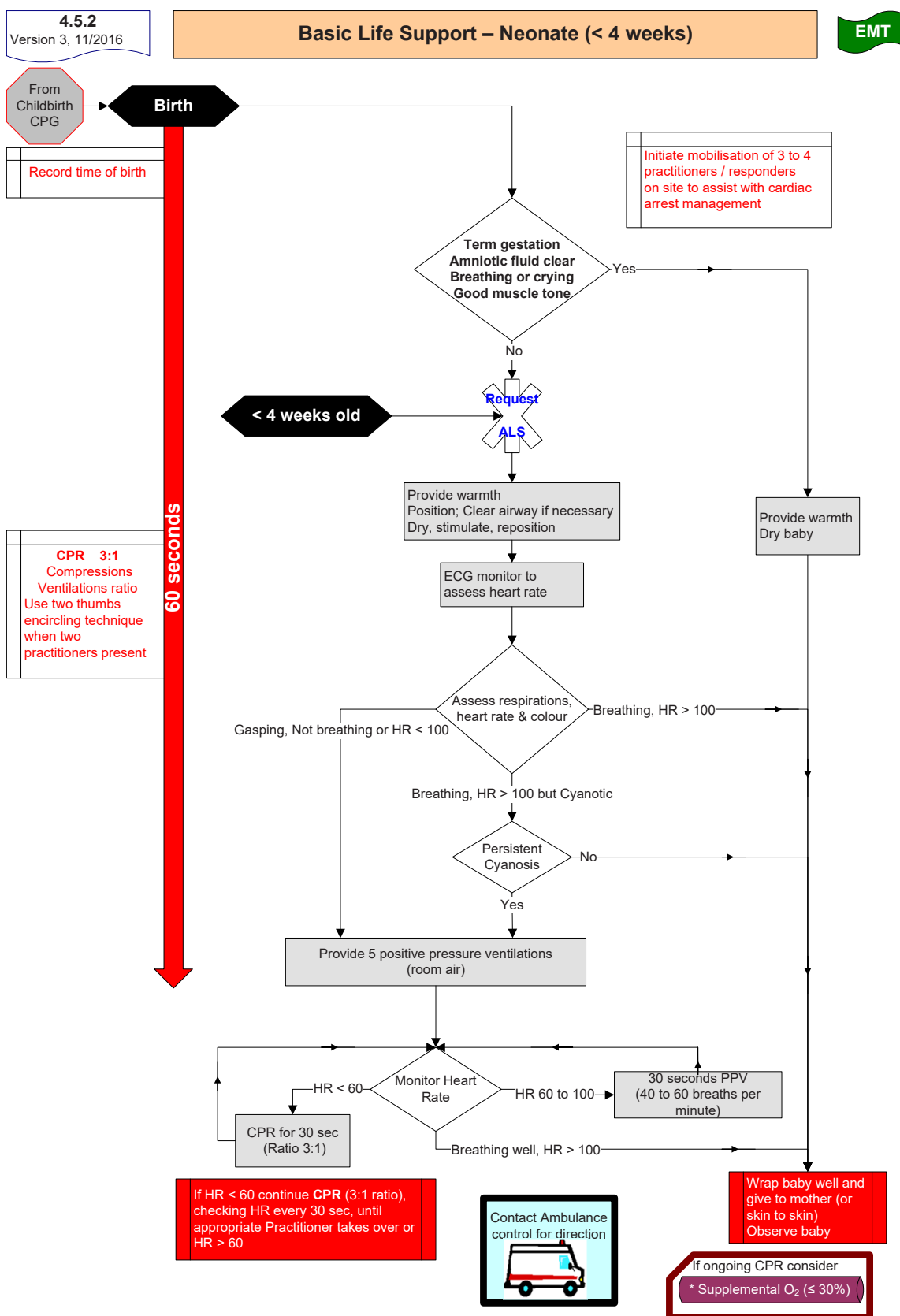
4.5.1
Version 2, 03/2016

Pre-Hospital Emergency Childbirth

EMT



SECTION 5 - Obstetric Emergencies

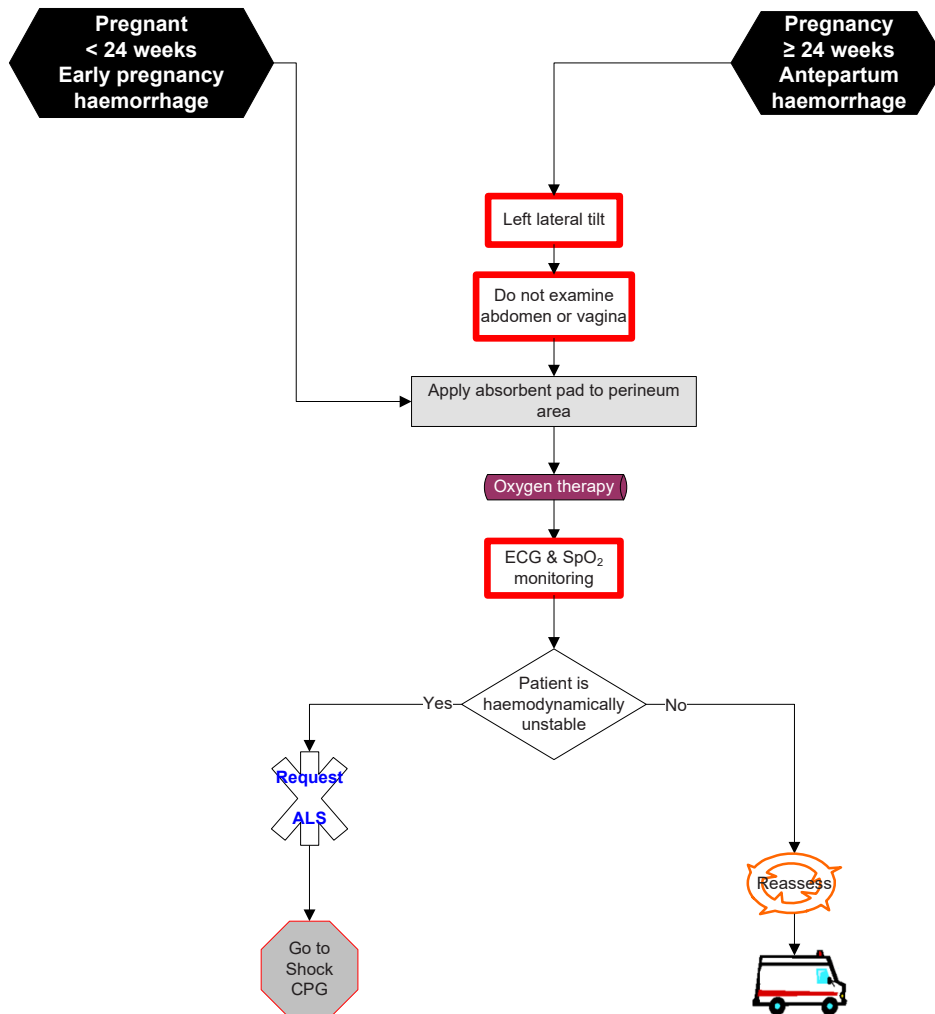
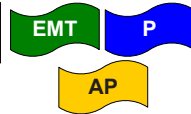


Reference: ILCOR Guidelines 2015

SECTION 5 - Obstetric Emergencies

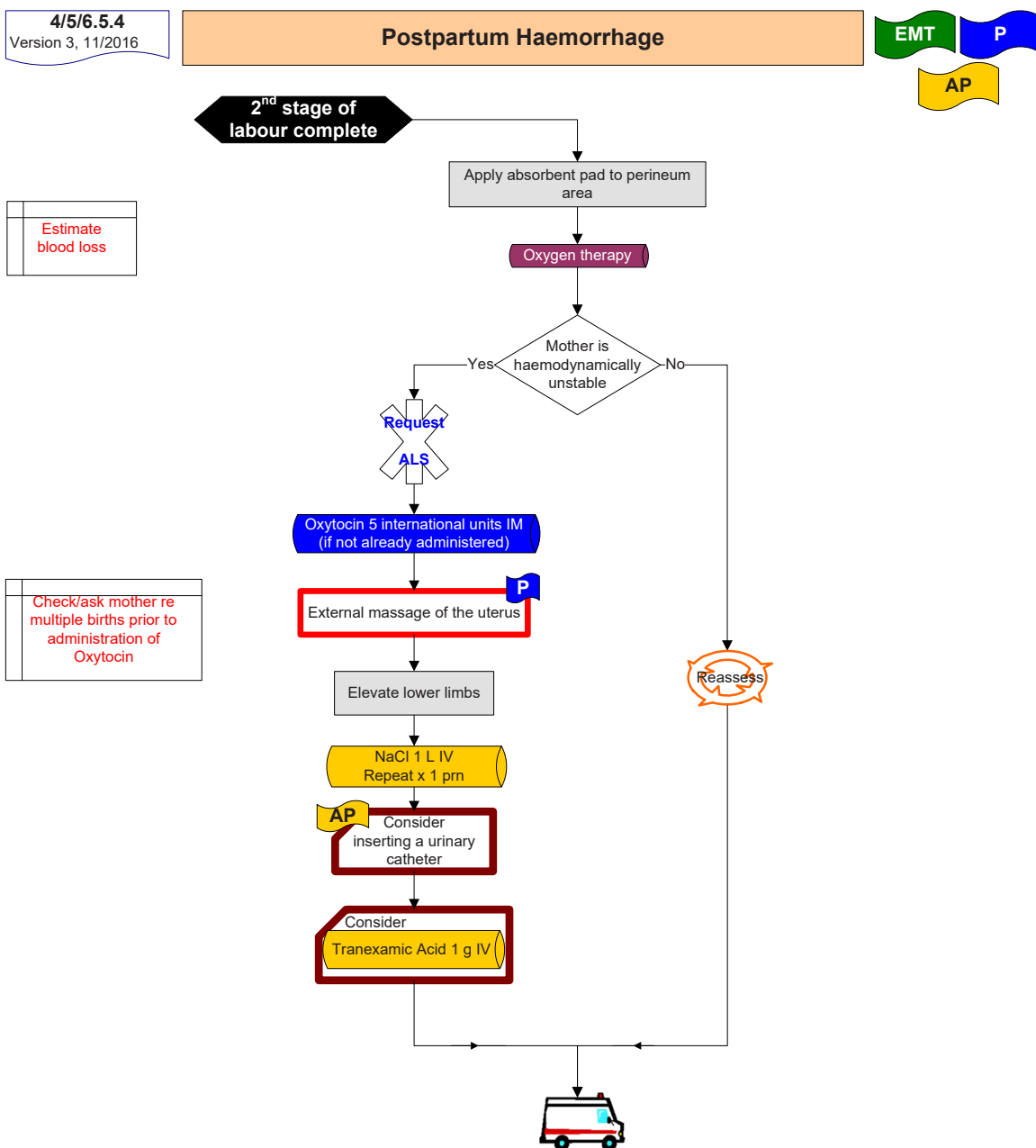
4/5/6.5.3
Version 2, 03/2016

PV Haemorrhage in Pregnancy



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

SECTION 5 - Obstetric Emergencies

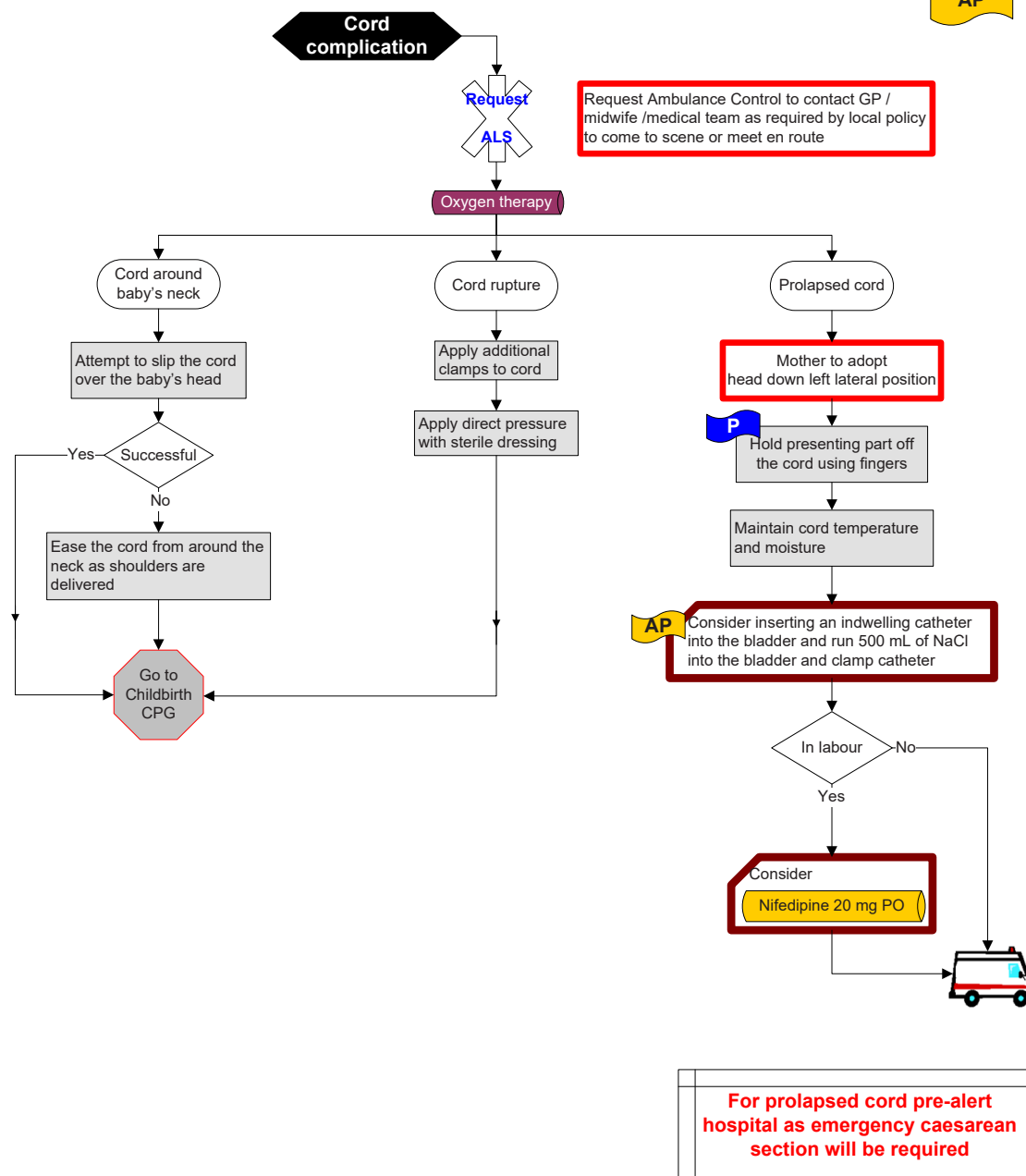
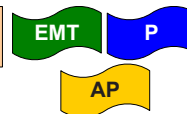


Reference: Institute of Obstetricians and Gynaecologists Royal College of Physicians of Ireland and Directorate of Strategy and Clinical Programmes Health Service Executive, 2014, Prevention and management of primary post partum haemorrhage – Guideline No 17

SECTION 5 - Obstetric Emergencies

4/5/6.5.5
Version 2, 03/2016

Umbilical Cord Complications

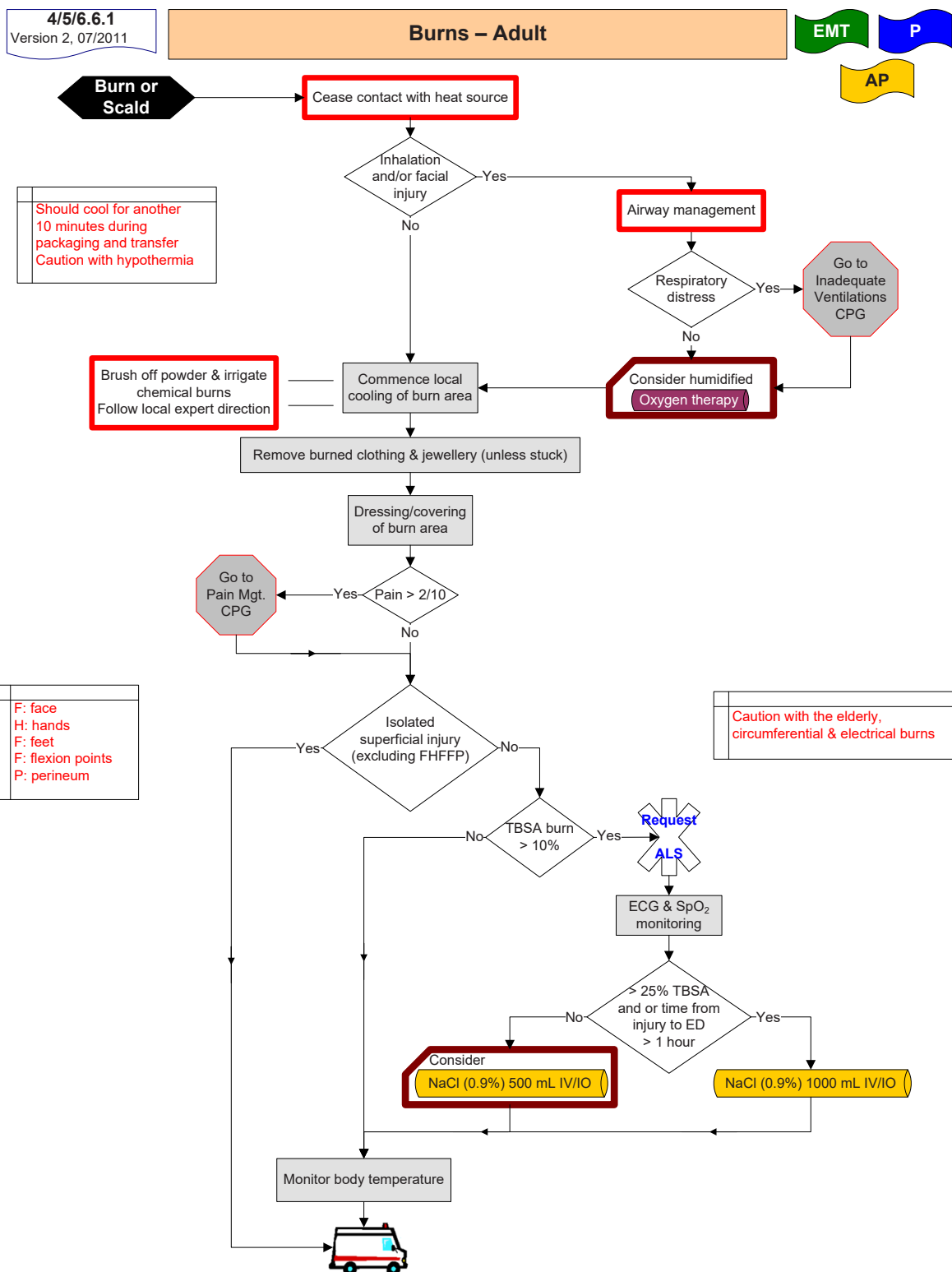


Reference: Sweet, BR, 2000, Mayes' Midwifery, 12th Edition, Bailliere Tindall

Katz Z et al, 1988, Management of labor with umbilical cord prolaps: A 5 year study. Obstet. Gynecol. 72(2): 278-281

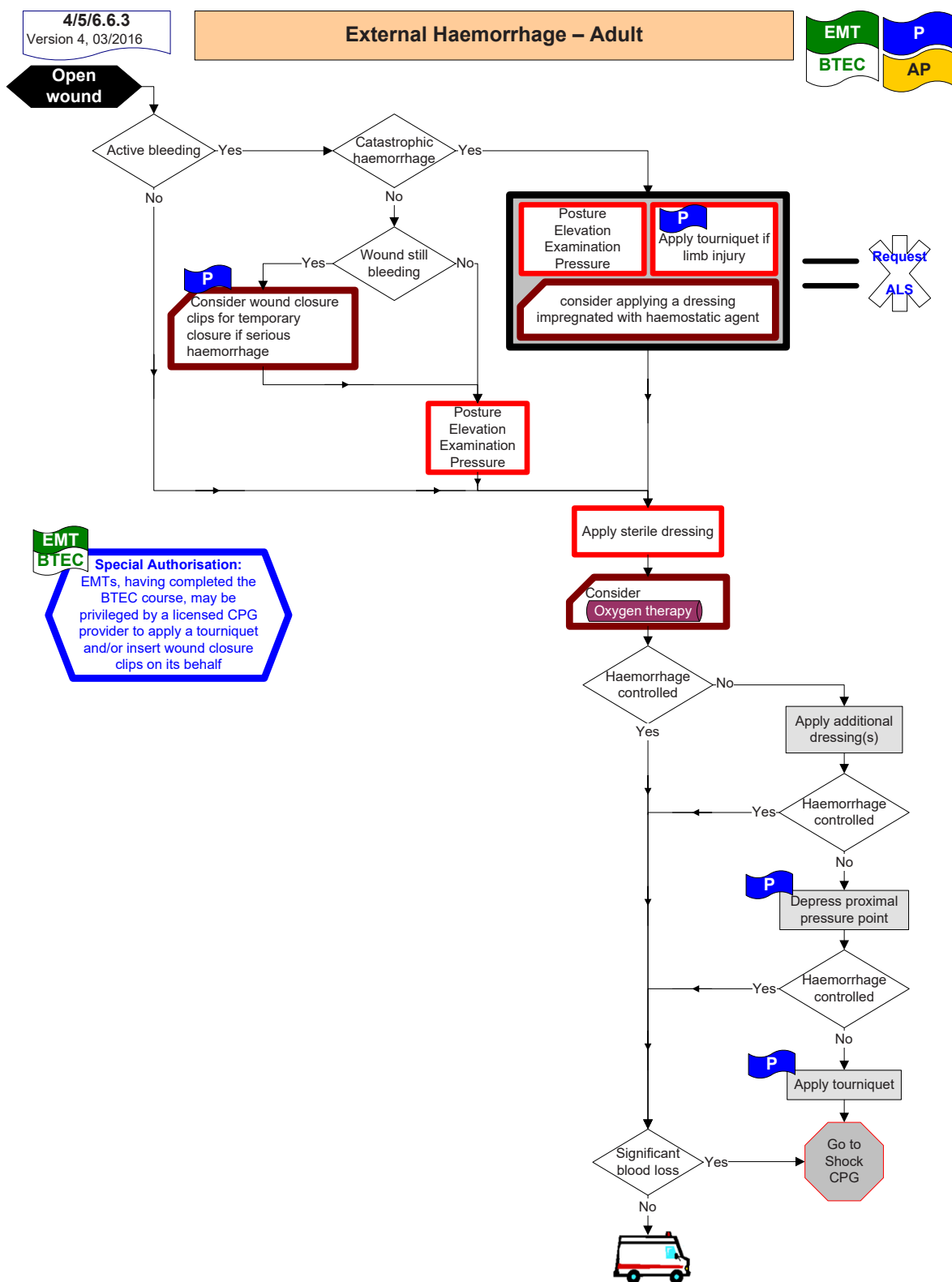
Duley, LMM, 2002, Clinical Guideline No 1(B), Tocolytic Drugs for women in preterm labour, Royal College of Obstetricians and gynaecologists

SECTION 6 - Trauma



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

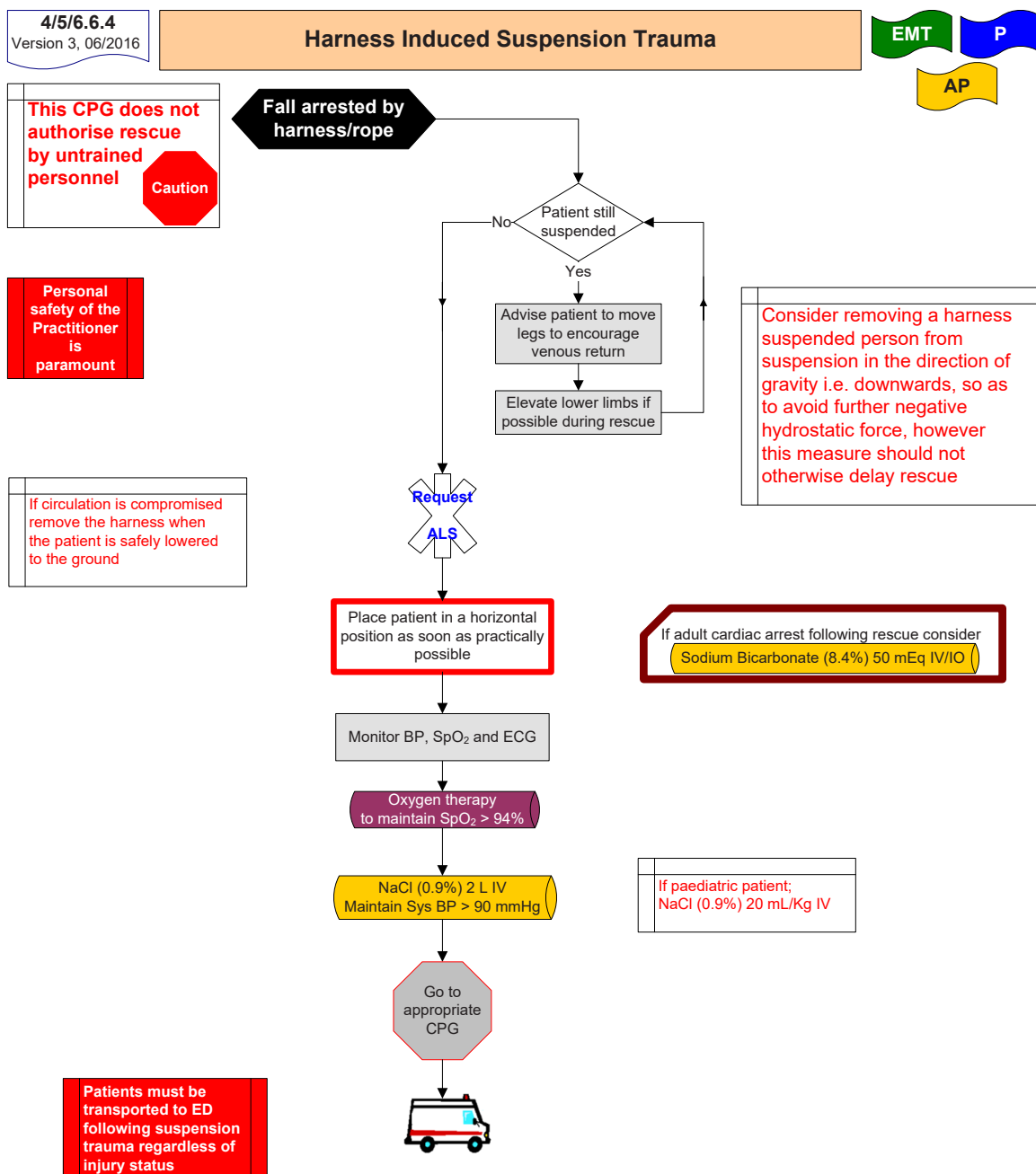
SECTION 6 - Trauma



Reference: ILCOR Guidelines 2015

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

SECTION 6 - Trauma



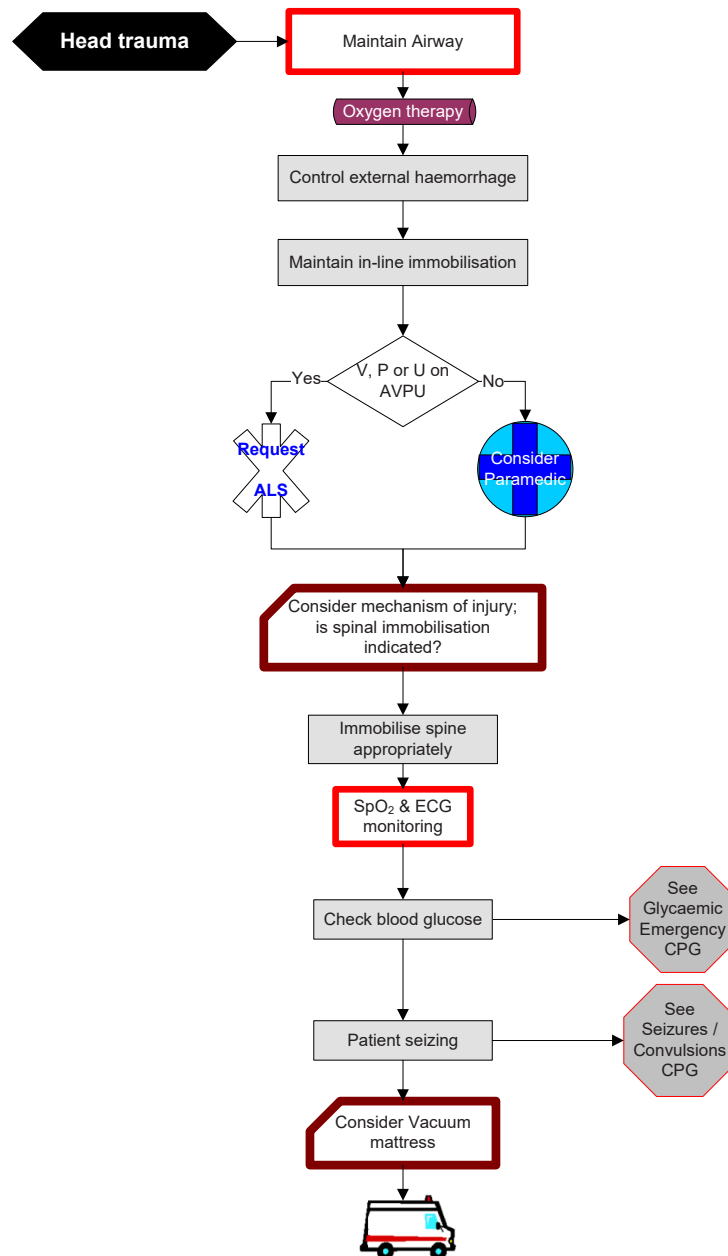
Reference: Adish A et al, 2009, Evidence-based review of the current guidance on first aid measures for suspension trauma, Health and Safety Executive (UK) Research report RR708
 Australian Resuscitation Council, 2009, Guideline 9.1.5 Harness Suspension Trauma first aid management.
 Thomassen O et al,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

SECTION 6 - Trauma

4.6.5
Version 2, 01/2013

Head Injury – Adult

EMT

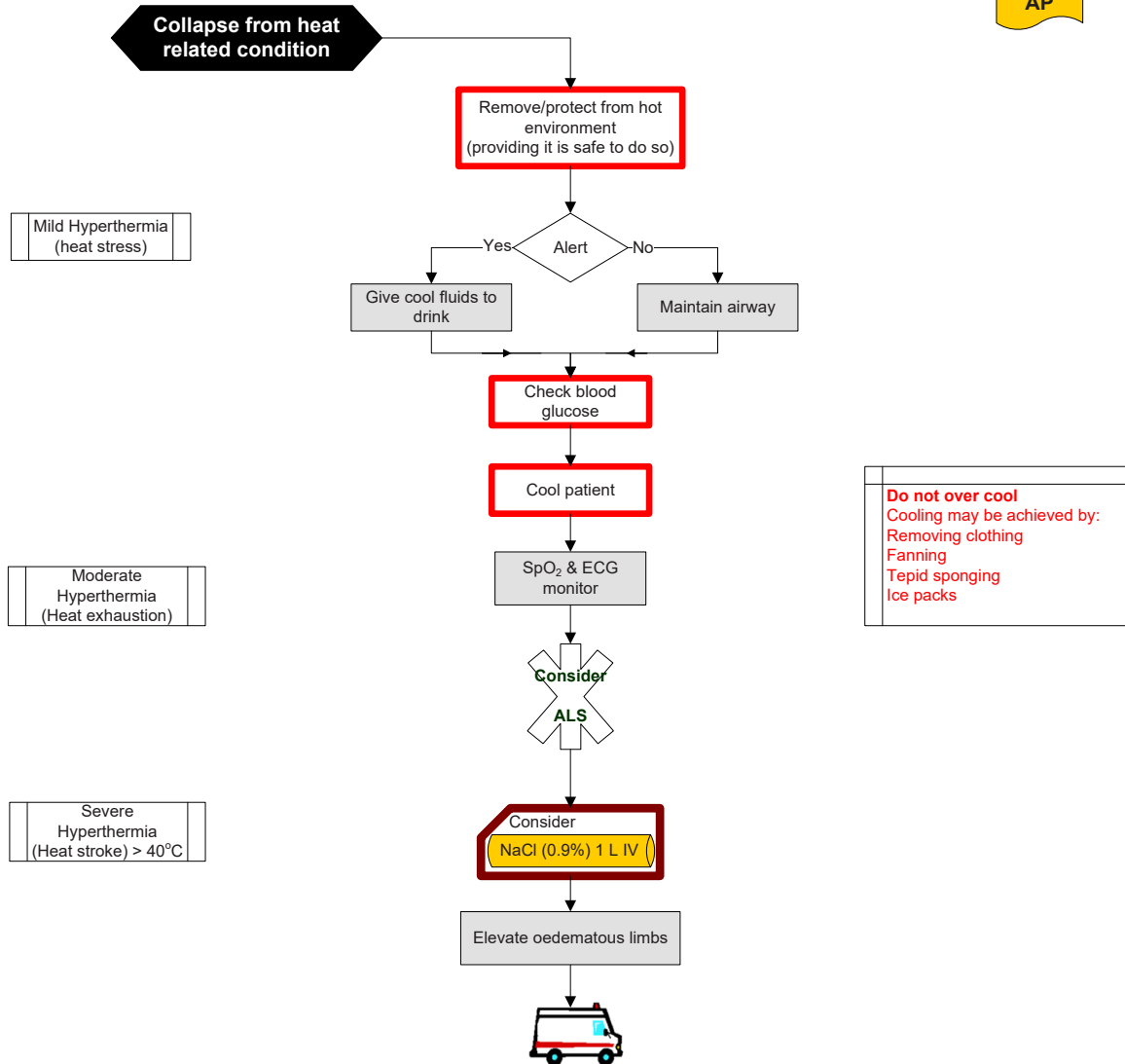
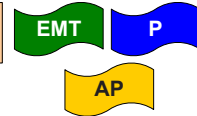


Reference; Mc Swain, N, 2011, PHTLS Prehospital Trauma Life Support 7th Edition, Mosby

SECTION 6 - Trauma

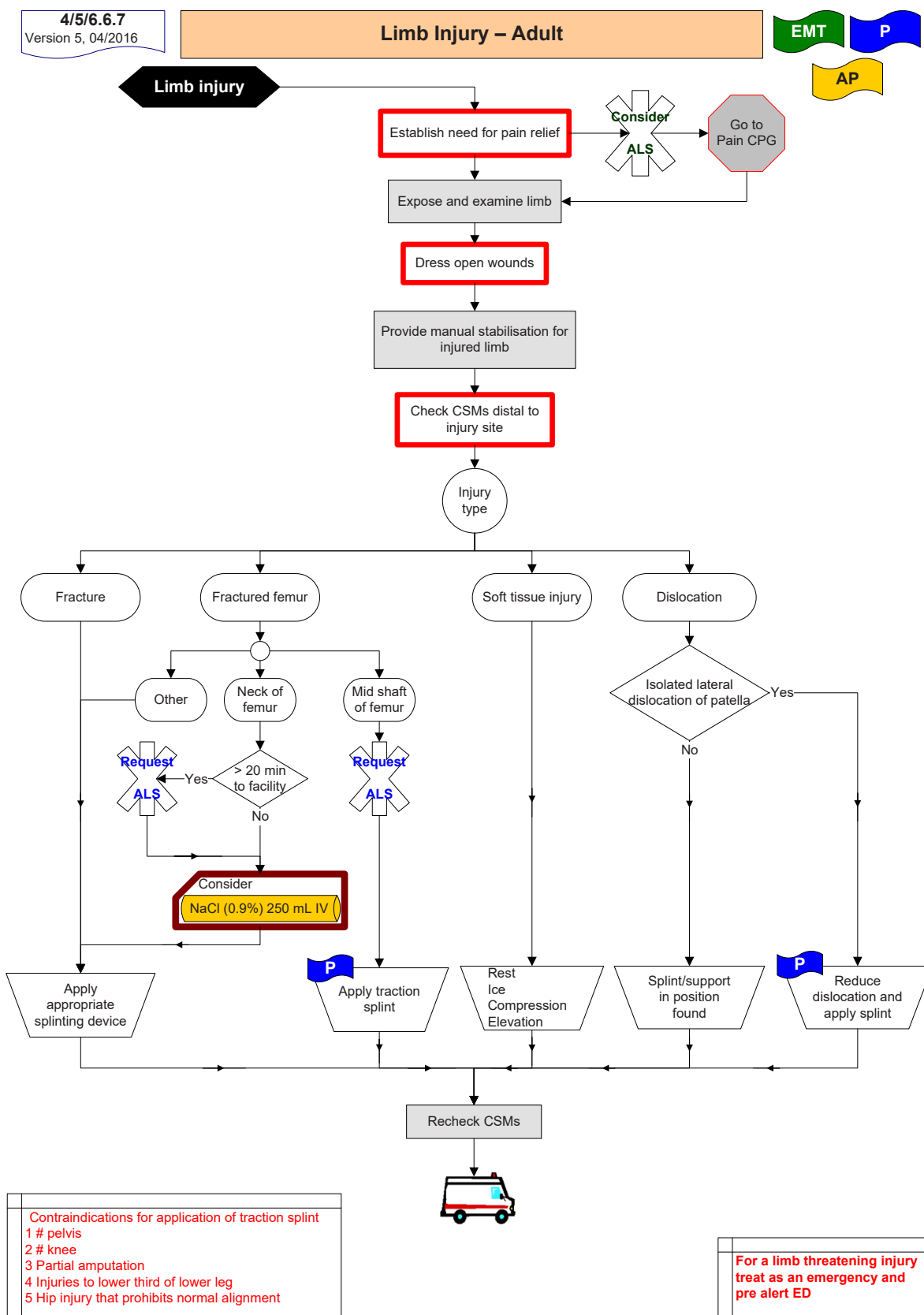
4/5/6.6.6
Version 2, 03/2016

Heat Related Emergency – Adult



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

SECTION 6 - Trauma



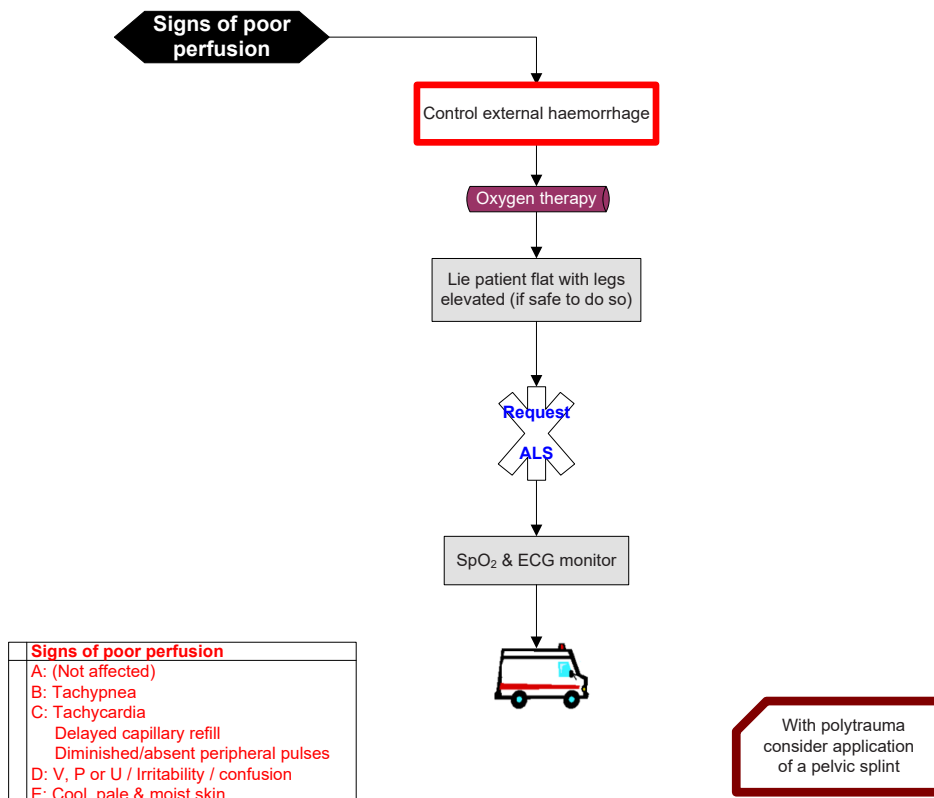
Reference: An algorithm guiding the evaluation and treatment of acute primary patellar dislocations, Mehta VM et al. Sports Med Arthrosc. 2007 Jun;15(2):78-81

SECTION 6 - Trauma

4.6.8
Version 2, 01/2013

Shock from Blood Loss – Adult

EMT

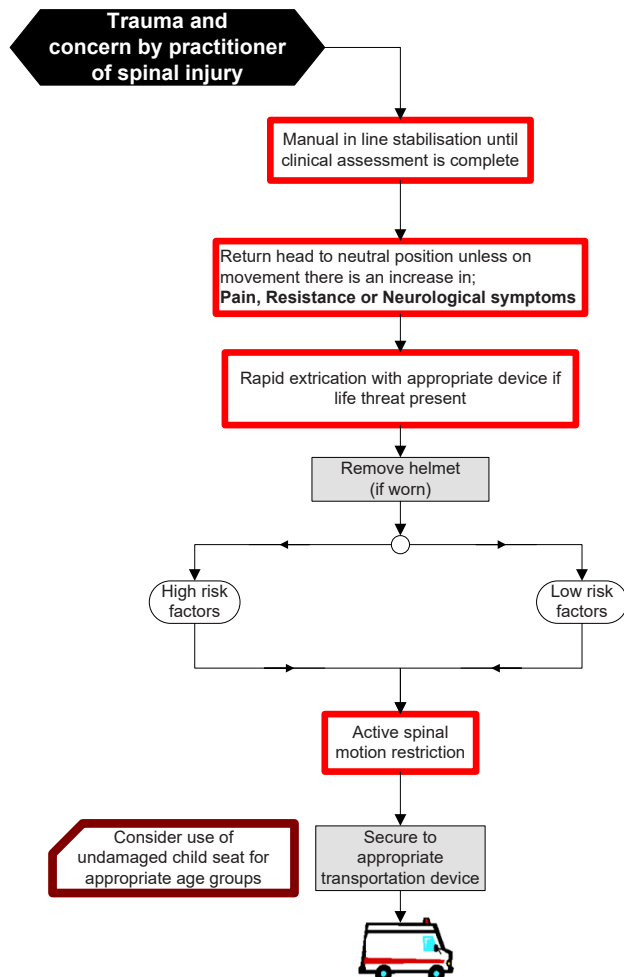


SECTION 6 - Trauma

4.6.9
Version 2, 06/2016

Spinal Injury Management

EMT



High risk factors:- any of the following;

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

– for example;

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

Low risk factors:- any two or more of;

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

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

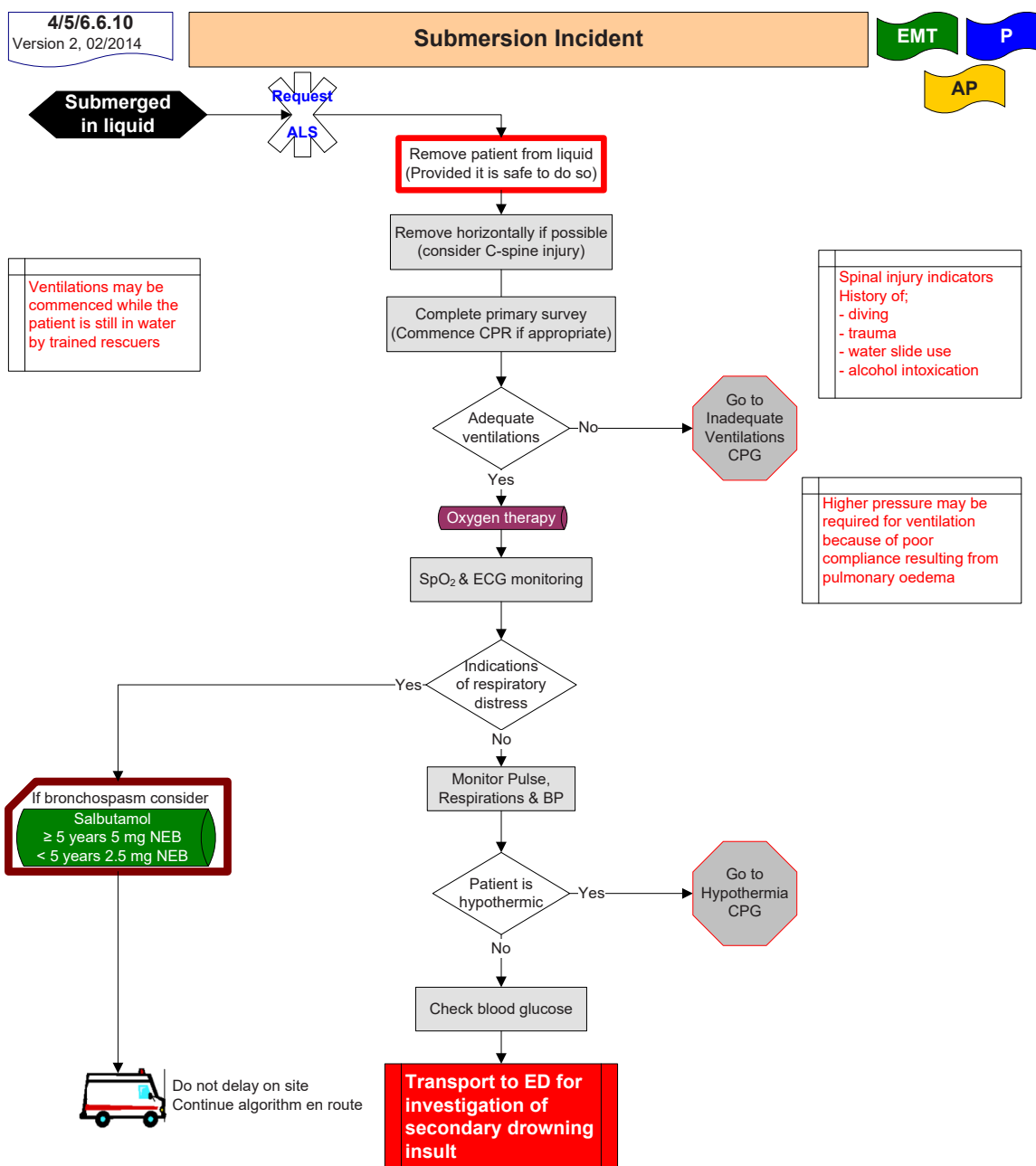
Spinal injury rule in considerations;

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

PHECC Spinal Injury Management Standard

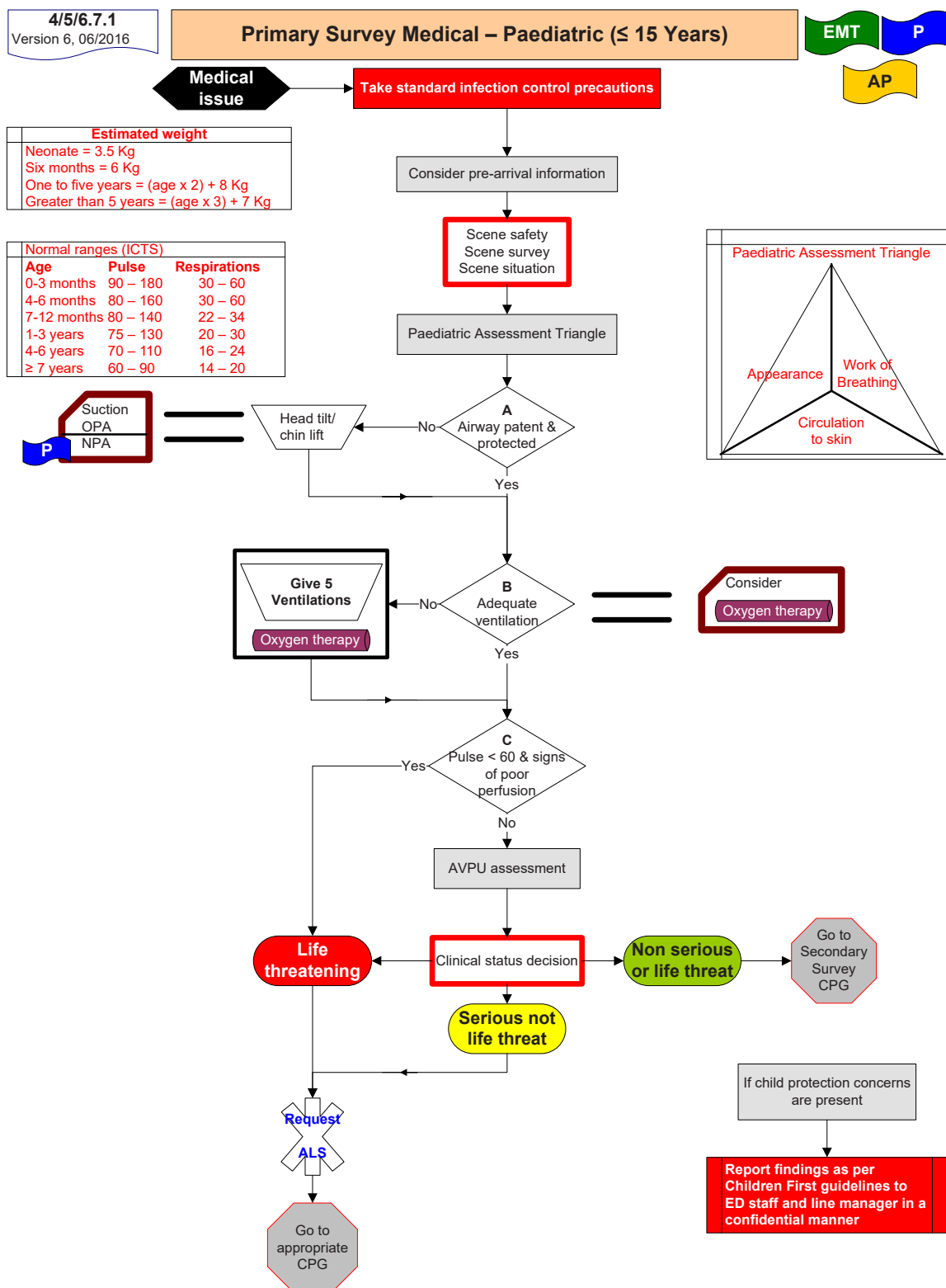
- ☐ **Active spinal motion restriction;** using manual inline techniques with or without spinal injury management devices to reduce spinal column motion.

SECTION 6 - Trauma



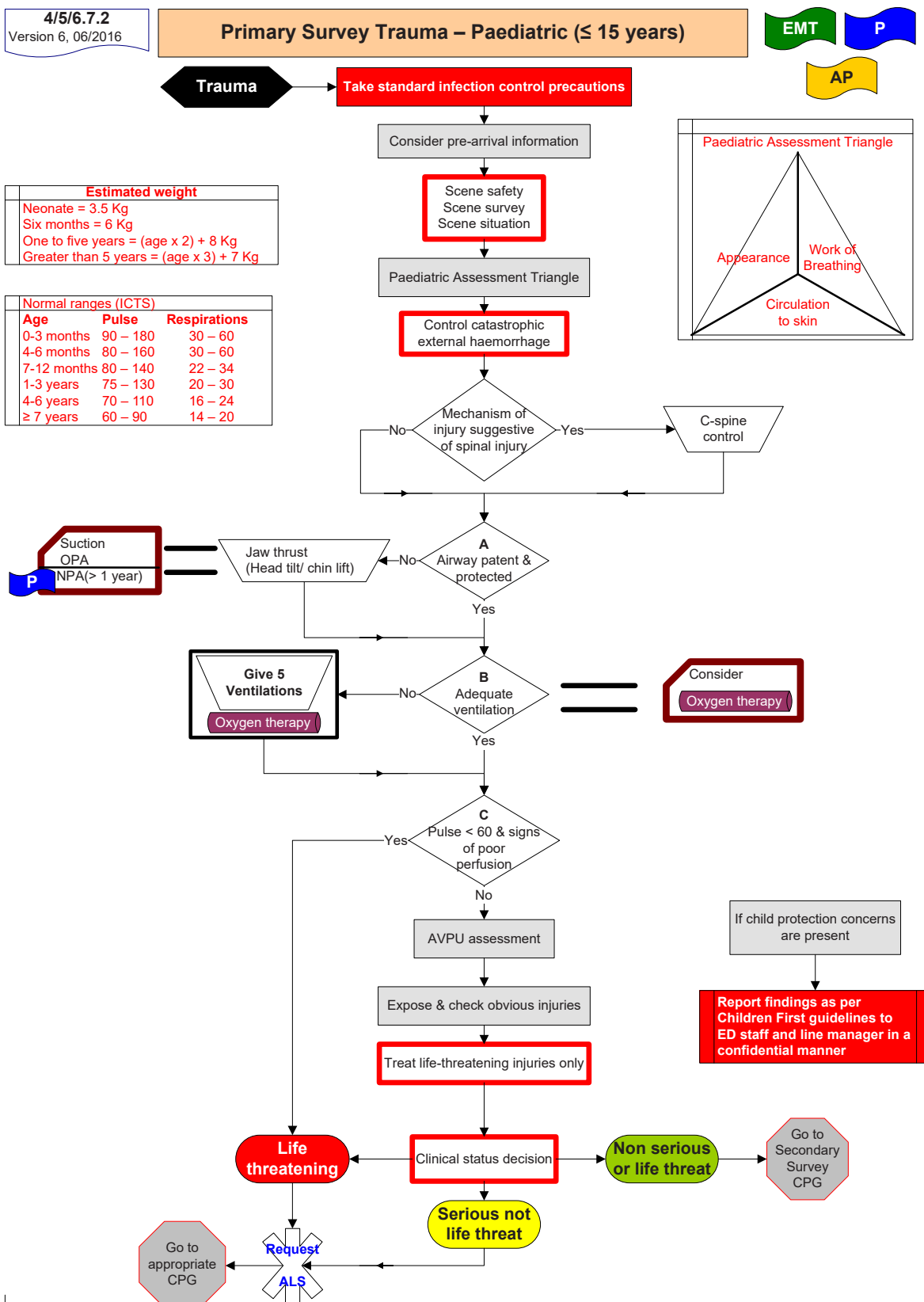
Reference: Golden, F & Tipton M, 2002, Essentials of Sea Survival, Human Kinetics
 Verie, M, 2007, Near Drowning, E medicine, www.emedicine.com/ped/topic20570.htm
 Shepherd, S, 2005, Submersion Injury, Near Drowning, E Medicine, www.emedicine.com/emerg/topic744.htm
 AHA, 2005, Part 10.3: Drowning, Circulation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

SECTION 7 - Paediatric Emergencies



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

SECTION 7 - Paediatric Emergencies

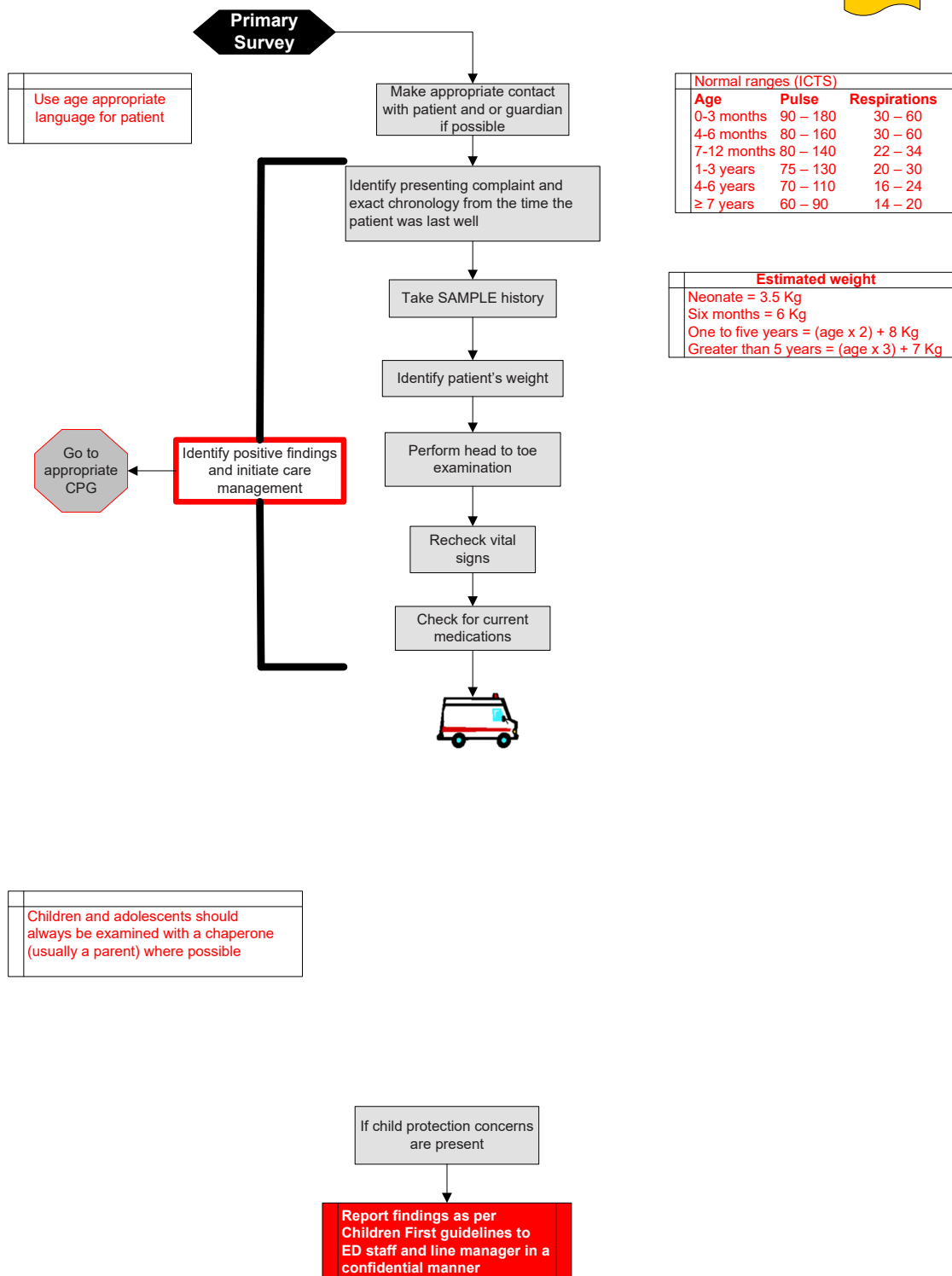
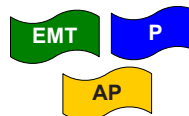


Reference:
ILCOR Guidelines 2015, American Academy of Pediatrics, 2000, Pediatric Education for Prehospital Professionals
Department of Children and Youth Affairs, 2011, Children First: National Guidance for the Protection and Welfare of Children
Irish Children's Triage System: National Emergency Medicine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

SECTION 7 - Paediatric Emergencies

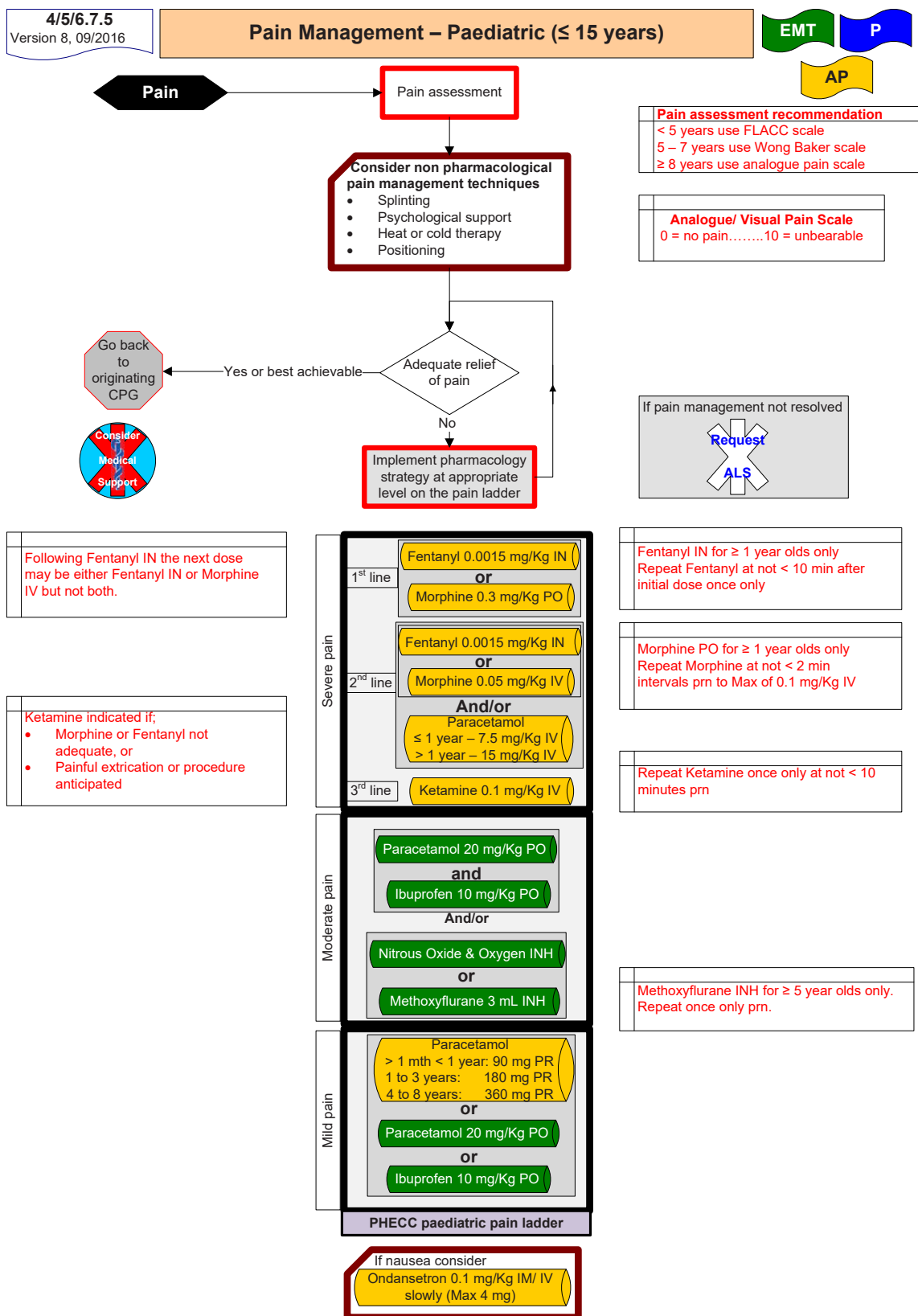
4/5/6.7.4
Version 4, 06/2016

Secondary Survey – Paediatric (≤ 15 years)



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=(age)+7'
Irish Children's Triage System: National Emergency Medicine Programme, 2015

SECTION 7 – Paediatric Emergencies



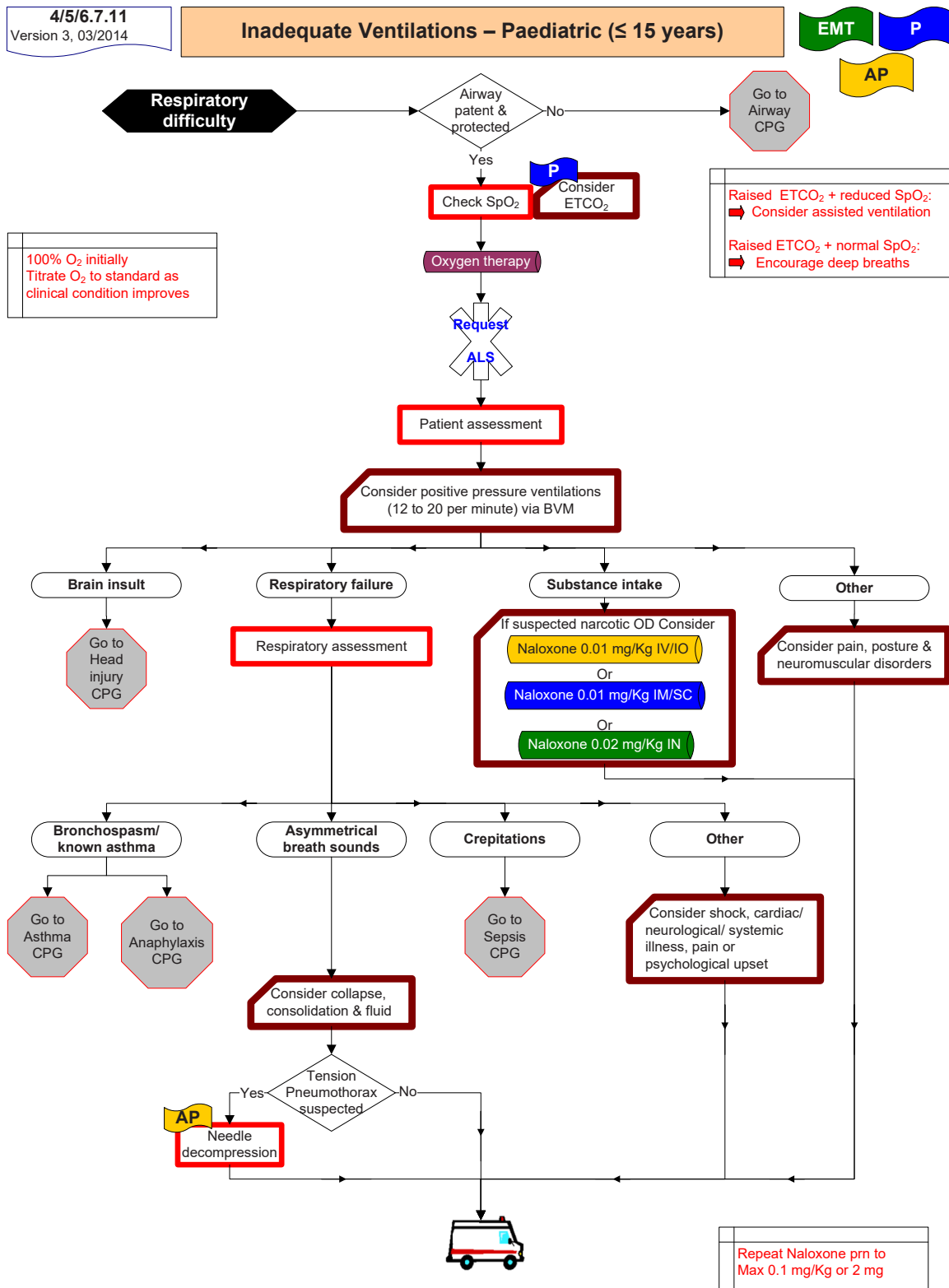
Reference: Coffey, F., et al. (2014). "STOP!: a randomised, double-blind, placebo-controlled study of the efficacy and safety of methoxyflurane for the treatment of acute pain." *Emerg Med J* 31(8): 613-618

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

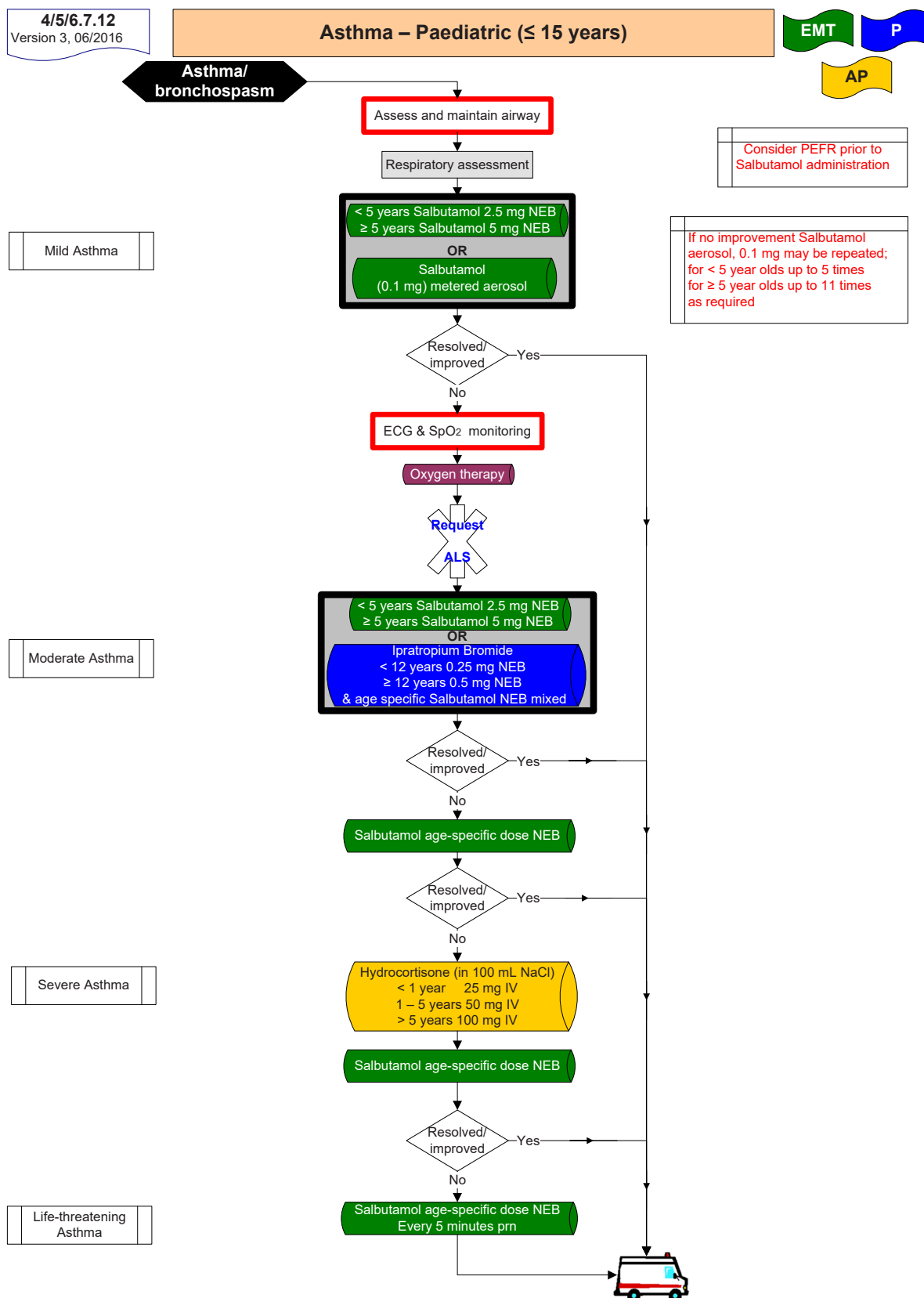
Park, C. L., et al. (2010). "Prehospital analgesia: systematic review of evidence." *J R Army Med Corps* 156(4 Suppl 1): 295-300

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

SECTION 7 - Paediatric Emergencies

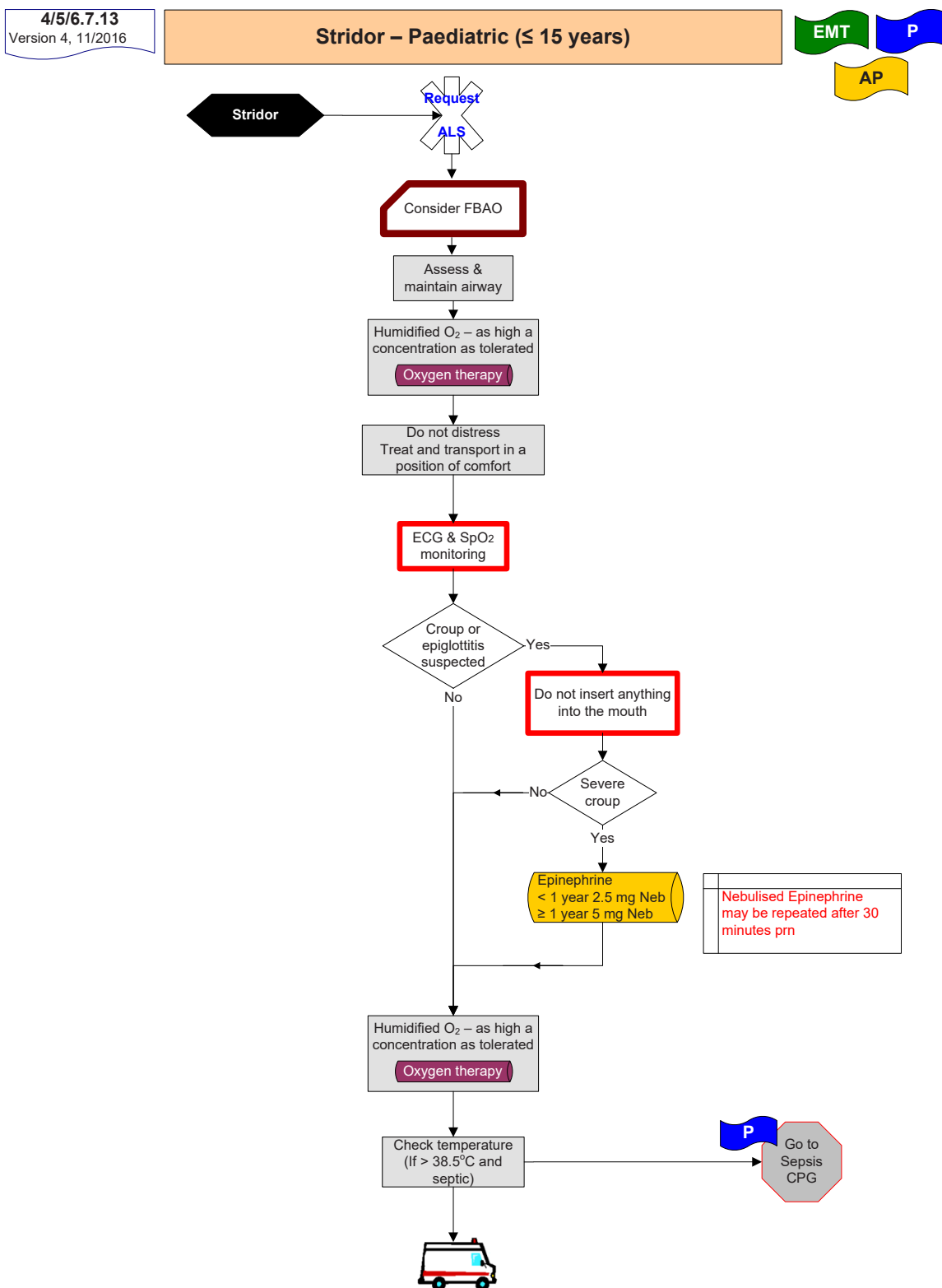


SECTION 7 - Paediatric Emergencies



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

SECTION 7 - Paediatric Emergencies



Reference: BNF for children 2015 - 2016

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

SECTION 7 – Paediatric Emergencies

4/5/6.7.20
Version 3, 03/2016

Basic Life Support – Paediatric (≤ 15 Years)



Initiate mobilisation of 3 to 4 practitioners / responders

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

Give 5 rescue ventilations
Oxygen therapy

Request
ALS

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

Yes < 8 years No

Apply paediatric system
AED pads

Apply adult defibrillation
pads

Assess
Rhythm

Shockable
VF or pulseless VT
(4 J/Kg)

Non - Shockable
Asystole or PEA

Give 1
shock

Immediately resume CPR
x 2 minutes

Rhythm check *

Go to VF /
Pulseless VT
CPG

VF/ VT

ROSC

Go to Post
Resuscitation
Care CPG

Asystole / PEA

Go to
Asystole /
PEA CPG

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

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

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

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

AP Change defibrillator to
manual mode

P Consider changing
defibrillator to
manual mode

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

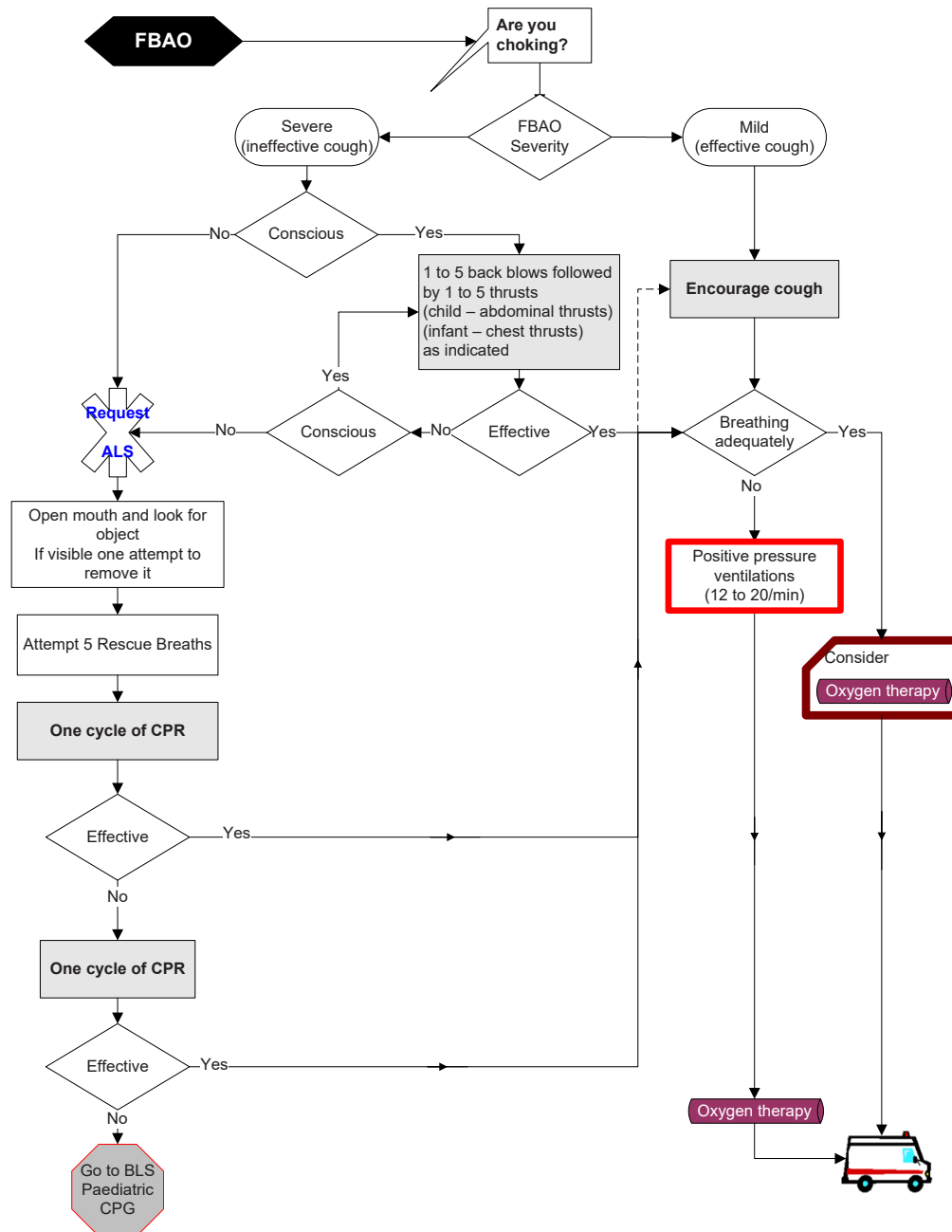
SECTION 7 – Paediatric Emergencies

4/5.7.21
Version 3, 03/2016

Foreign Body Airway Obstruction – Paediatric (≤ 15 years)

EMT

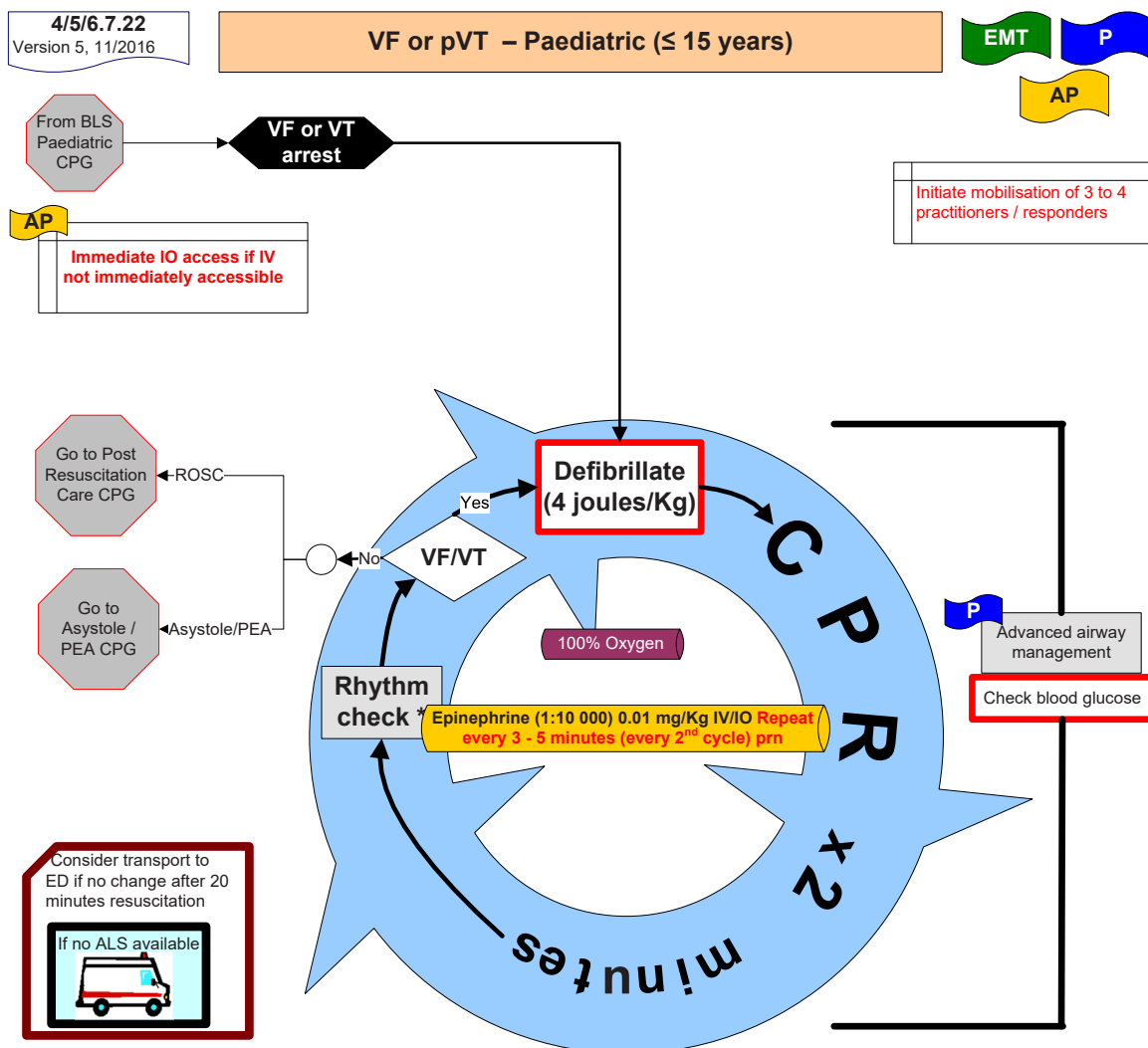
P



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

Reference:
ILCOR Guidelines 2015

SECTION 7 - Paediatric Emergencies



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

If refractory VF/pVT post Epinephrine and 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

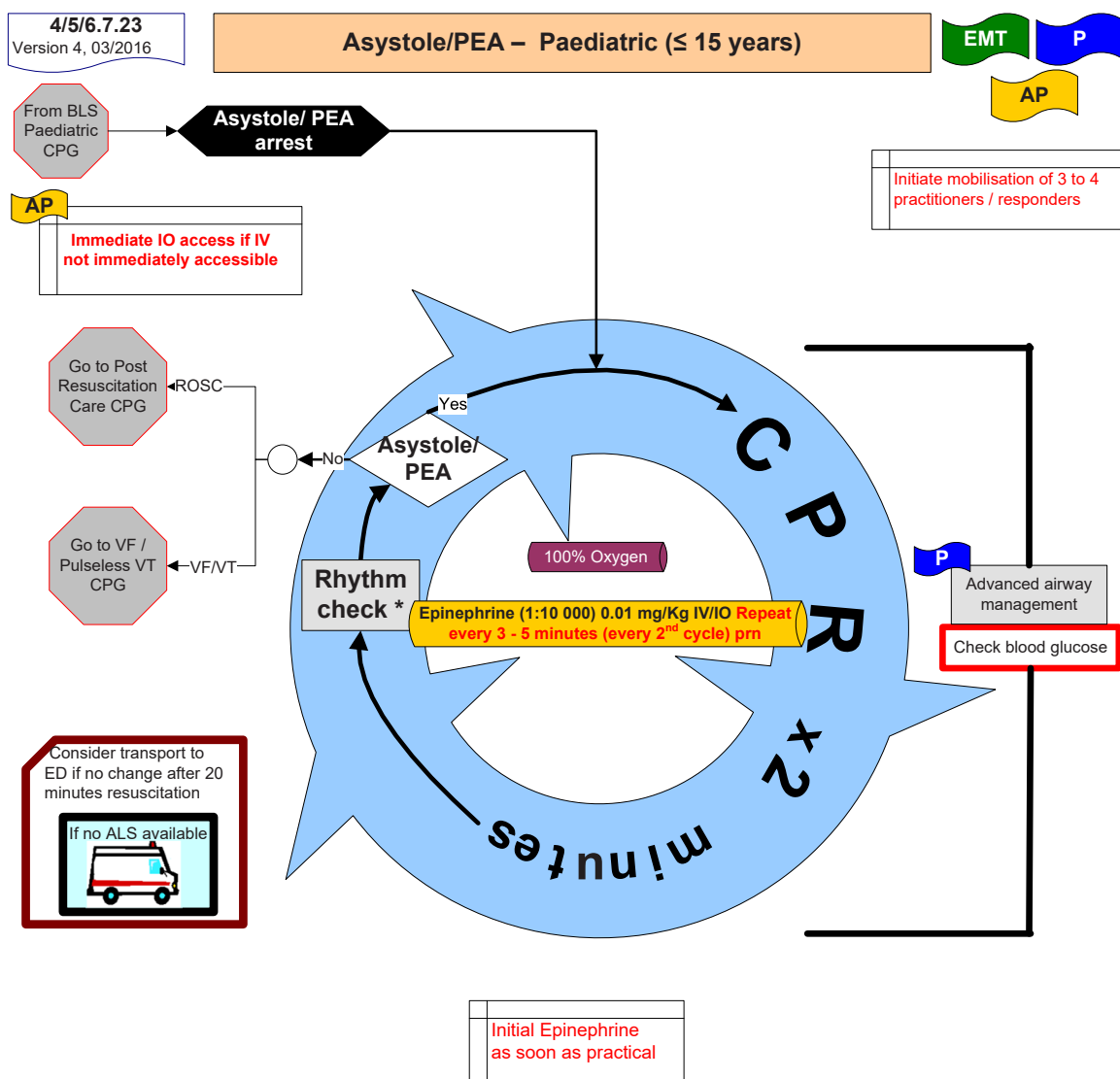
Consider causes and treat as appropriate:

- 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

SECTION 7 – Paediatric Emergencies



Consider causes and treat as appropriate:

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

Consider fluid challenge

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

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

Reference: ILCOR Guidelines 2015

SECTION 7 – Paediatric Emergencies

4/5/6.7.24
Version 4, 03/2016

Symptomatic Bradycardia – Paediatric (≤ 15 years)

EMT P

AP

AP

Immediate IO access if IV
not immediately accessible

Initiate mobilisation of 3 to 4
practitioners / responders

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

Check blood glucose

**Symptomatic
Bradycardia**

Oxygen therapy

Hypoxia

Consider positive
pressure ventilations
(12 to 20/min)

Request
ALS

Unresponsive
Signs of Inadequate
perfusion &
HR < 60

Yes

CPR

ECG & SpO₂
monitoring

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

Reassess

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

Persistent
bradycardia

Yes

Continue
CPR

If no ALS available

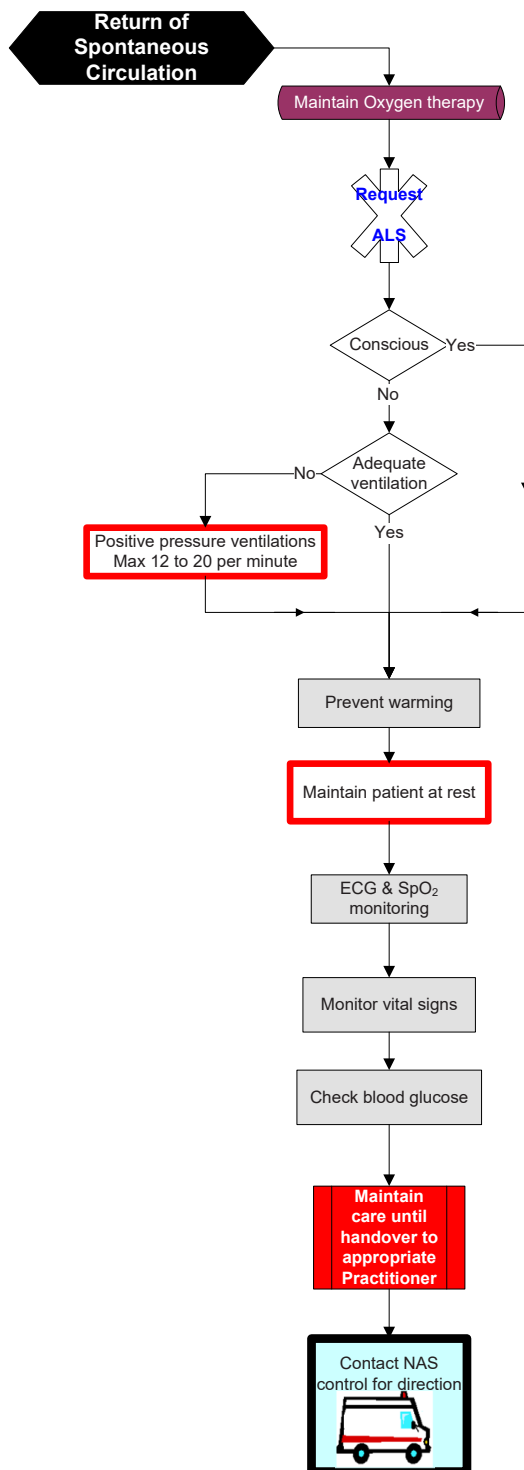
Reference: ILCOR Guidelines 2015

SECTION 7 - Paediatric Emergencies

4.7.25
Version 3, 03/2016

Post-Resuscitation Care – Paediatric (≤ 15 years)

EMT



	Titrate O ₂ to 96% - 98%

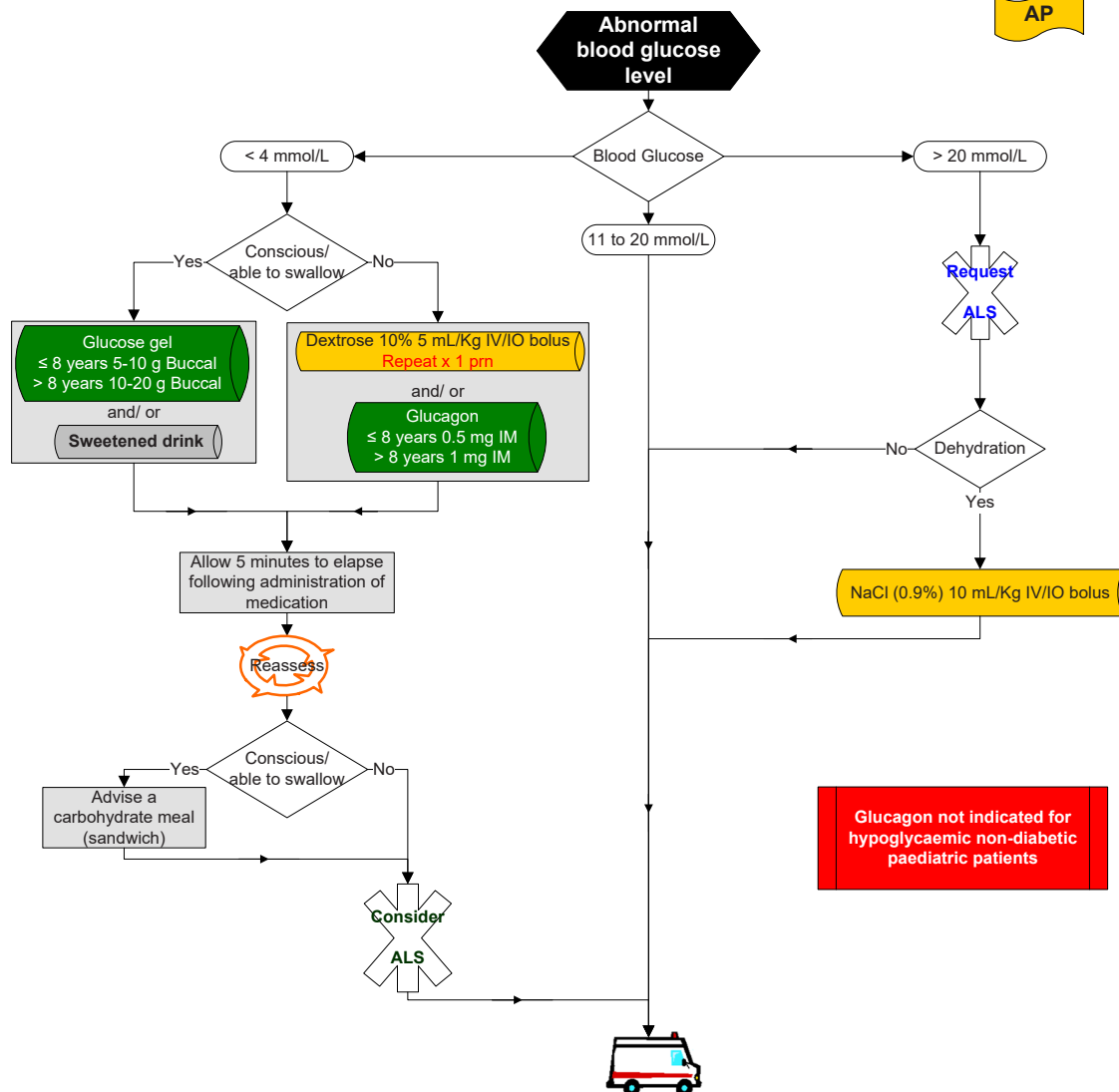
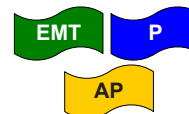
Reference: ILCOR Guidelines 2015



SECTION 7 - Paediatric Emergencies

4/5/6.7.32
Version 4, 04/2016

Glycaemic Emergency – Paediatric (≤ 15 years)



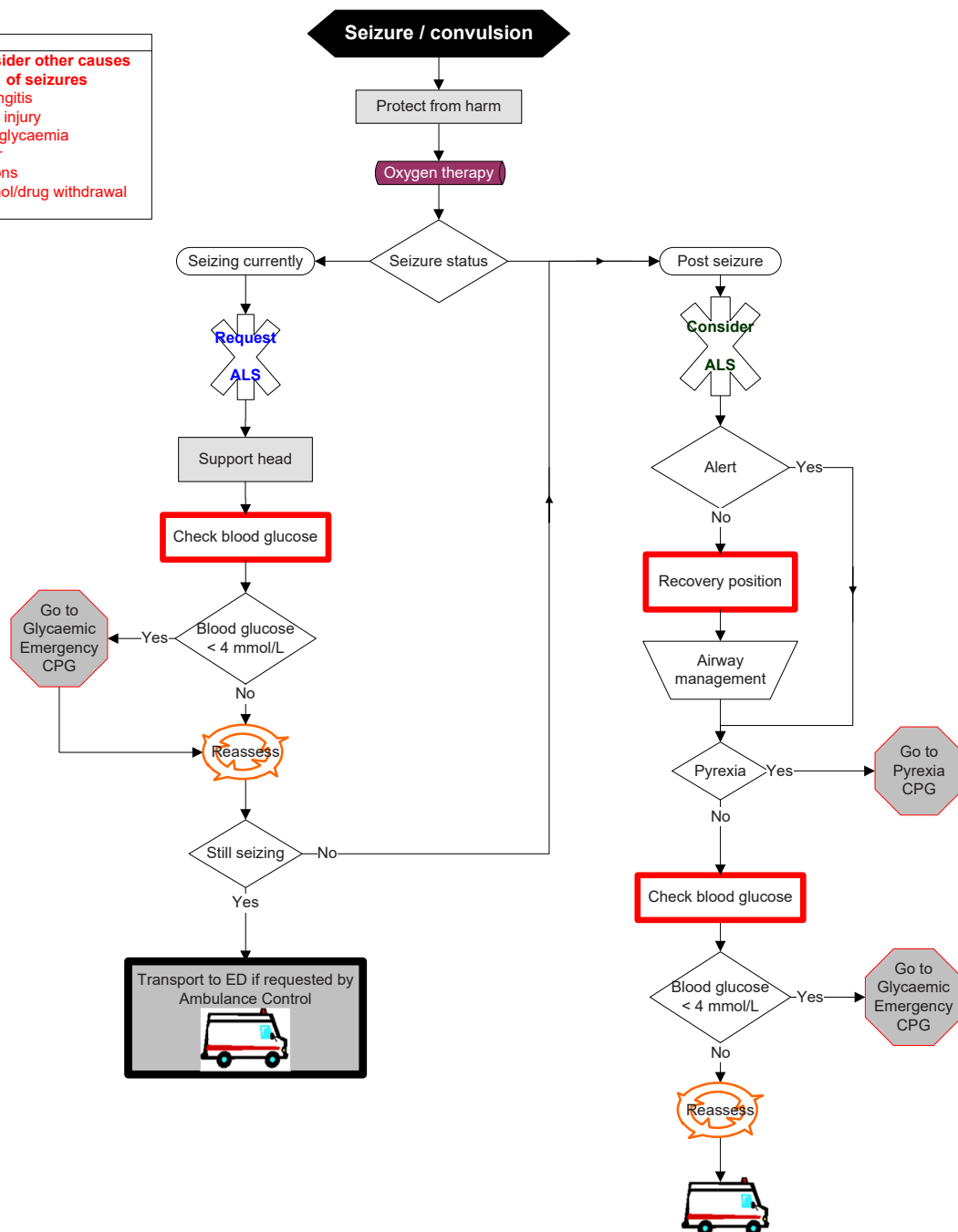
SECTION 7 - Paediatric Emergencies

4.7.33
Version 3, 02/14

Seizure/Convulsion – Paediatric (≤ 15 years)

EMT

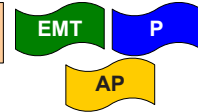
Consider other causes of seizures
Meningitis
Head injury
Hypoglycaemia
Fever
Poisons
Alcohol/drug withdrawal



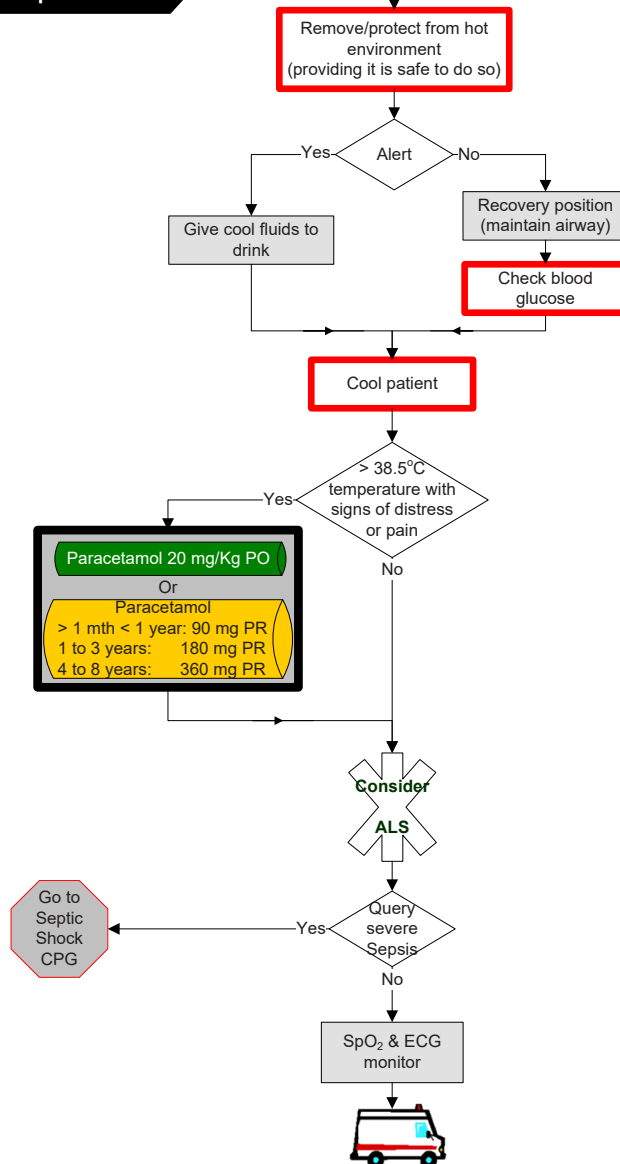
SECTION 7 - Paediatric Emergencies

4/5/6.7.35
Version 2, 03/2016

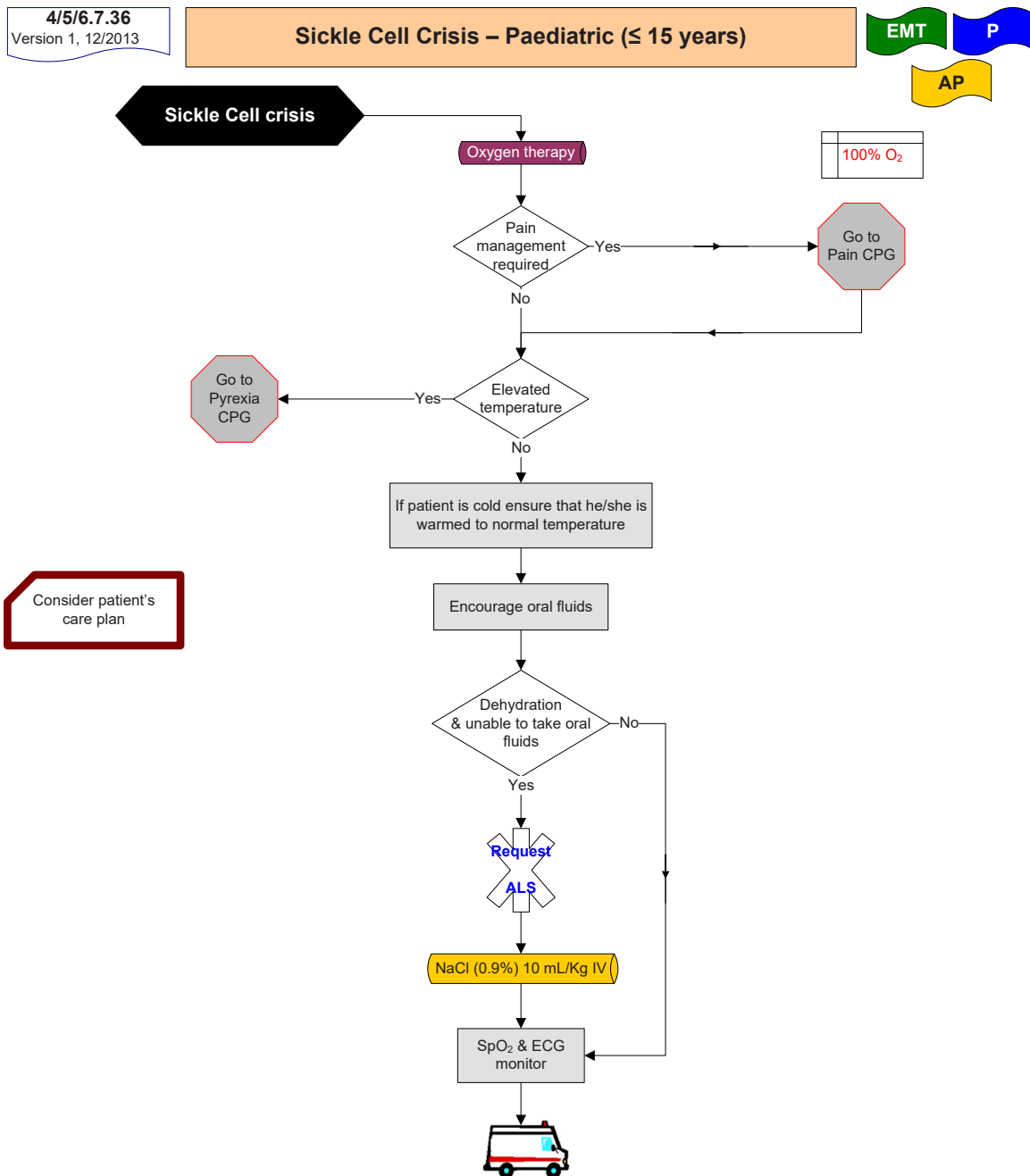
Pyrexia – Paediatric (≤ 15 years)



Child with elevated temperature

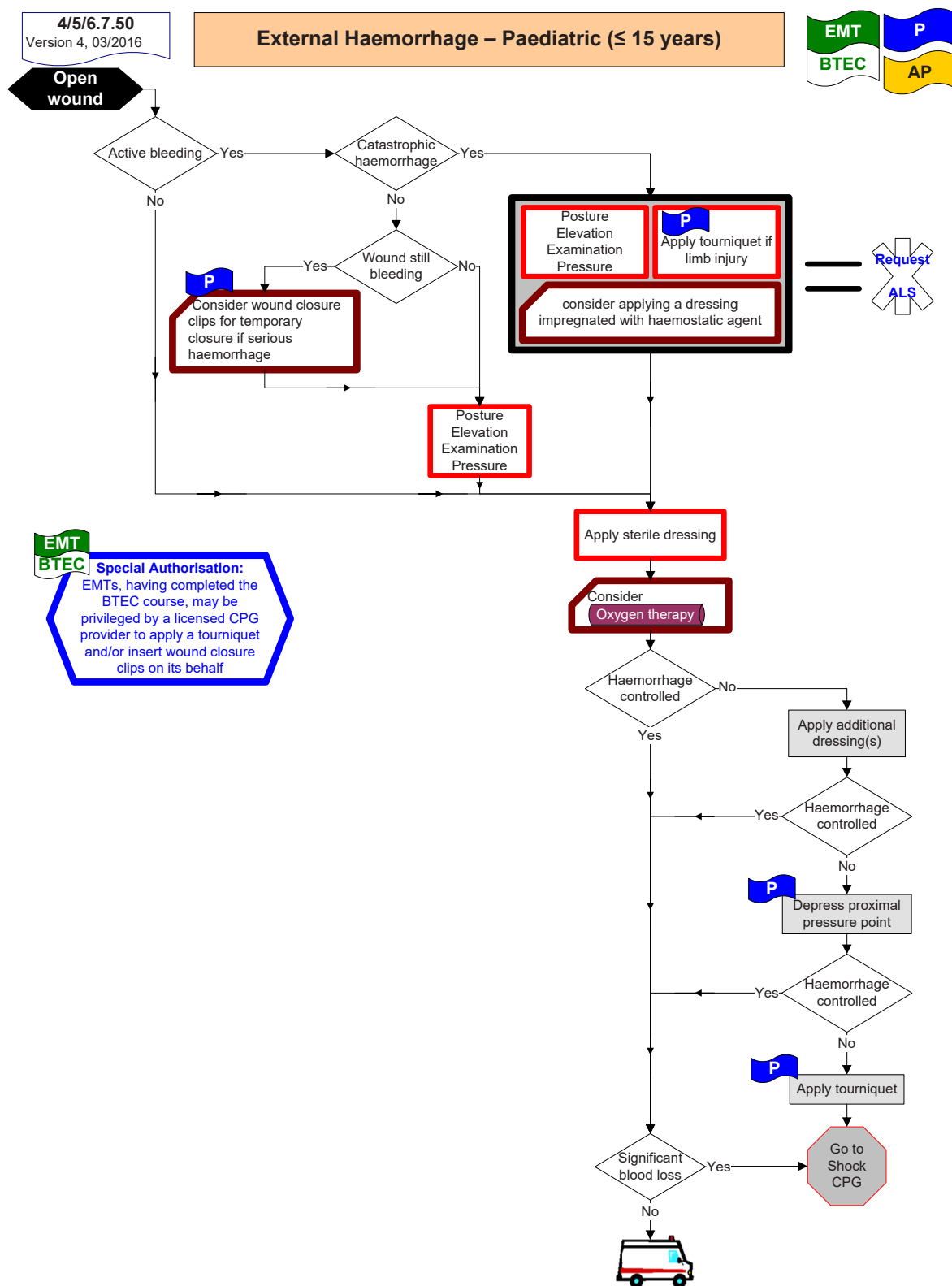


SECTION 7 – Paediatric Emergencies



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

SECTION 7 – Paediatric Emergencies



Reference: ILCOR Guidelines 2015

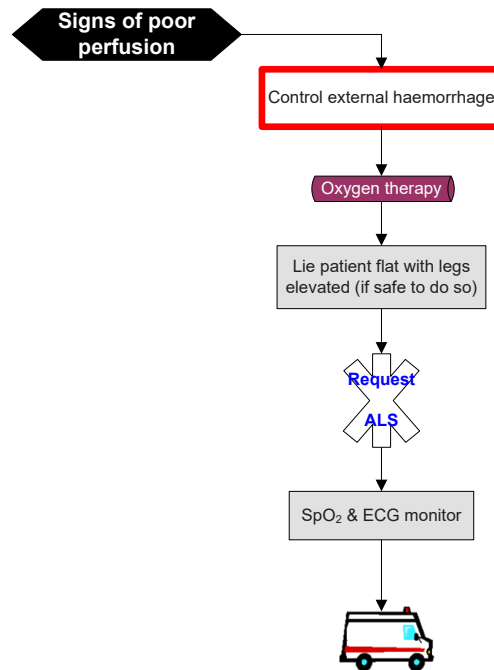
Granville-Chapman J, et al. Pre-hospital haemostatic dressings: A systematic review. Injury (2010), doi: 10.1016/j.injury.2010.09.037

SECTION 7 – Paediatric Emergencies

4.7.51
Version 2, 12/2013

Shock from Blood Loss – Paediatric (≤ 15 years)

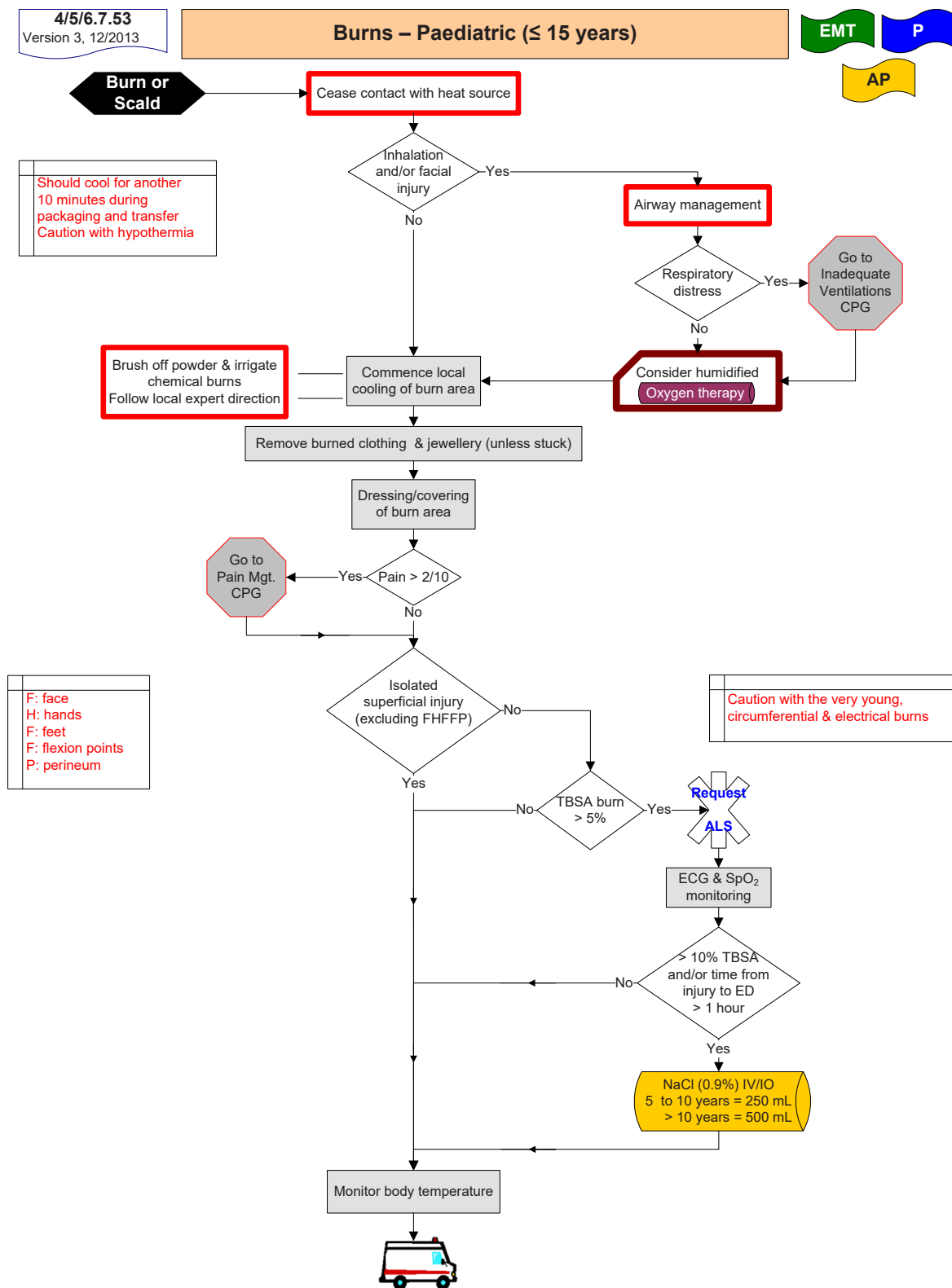
EMT



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

SECTION 7 - Paediatric Emergencies

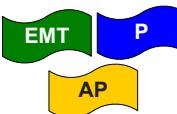


Reference: Allison, K et al, 2004, Consensus on the prehospital approach to burns patient management, Emerg Med J 2004; 21:112-114
Sanders, M, 2001, Paramedic Textbook 2nd Edition, Mosby

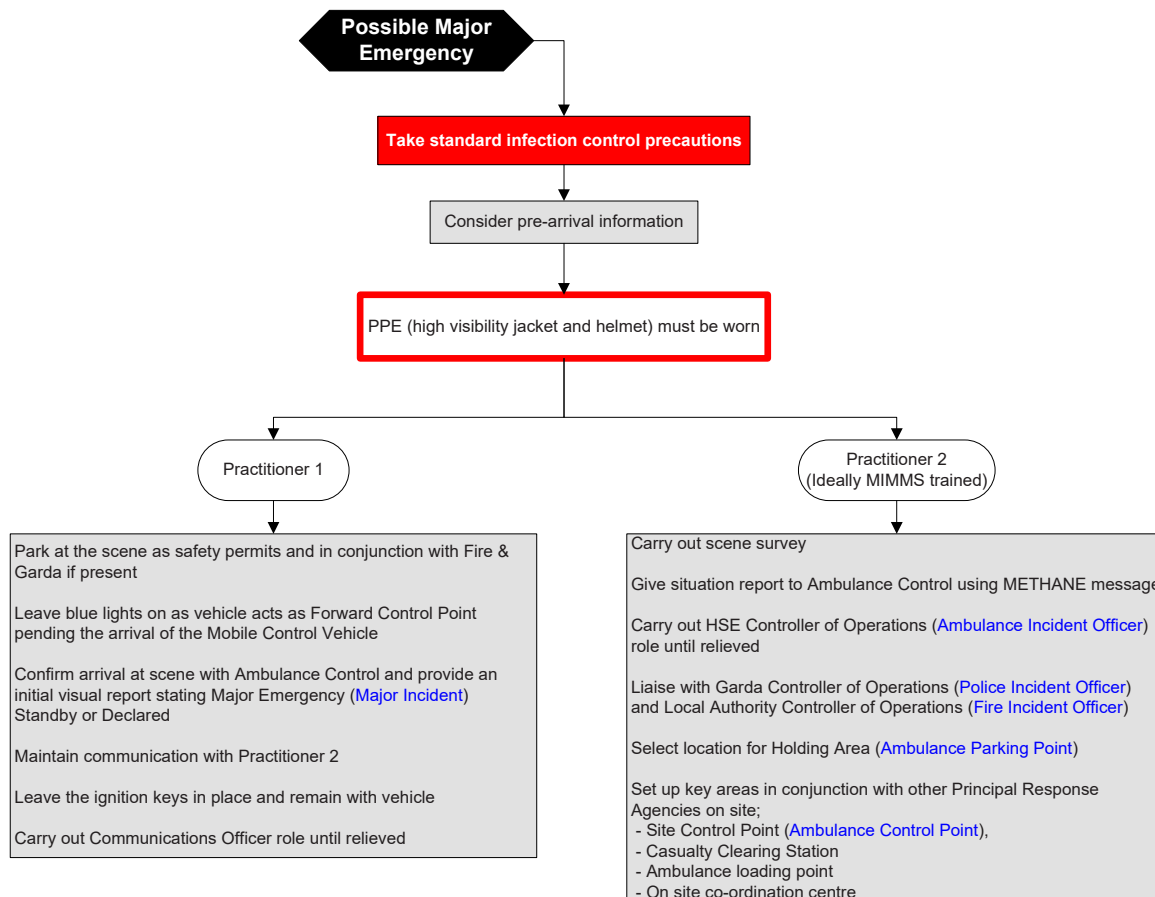
SECTION 8 – Pre-Hospital Emergency Care Operations

4/5/6.8.1
Version 2, 01/2013

Major Emergency (Major Incident) – First Practitioners on site



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



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)

SECTION 8 - Pre-Hospital Emergency Care Operations

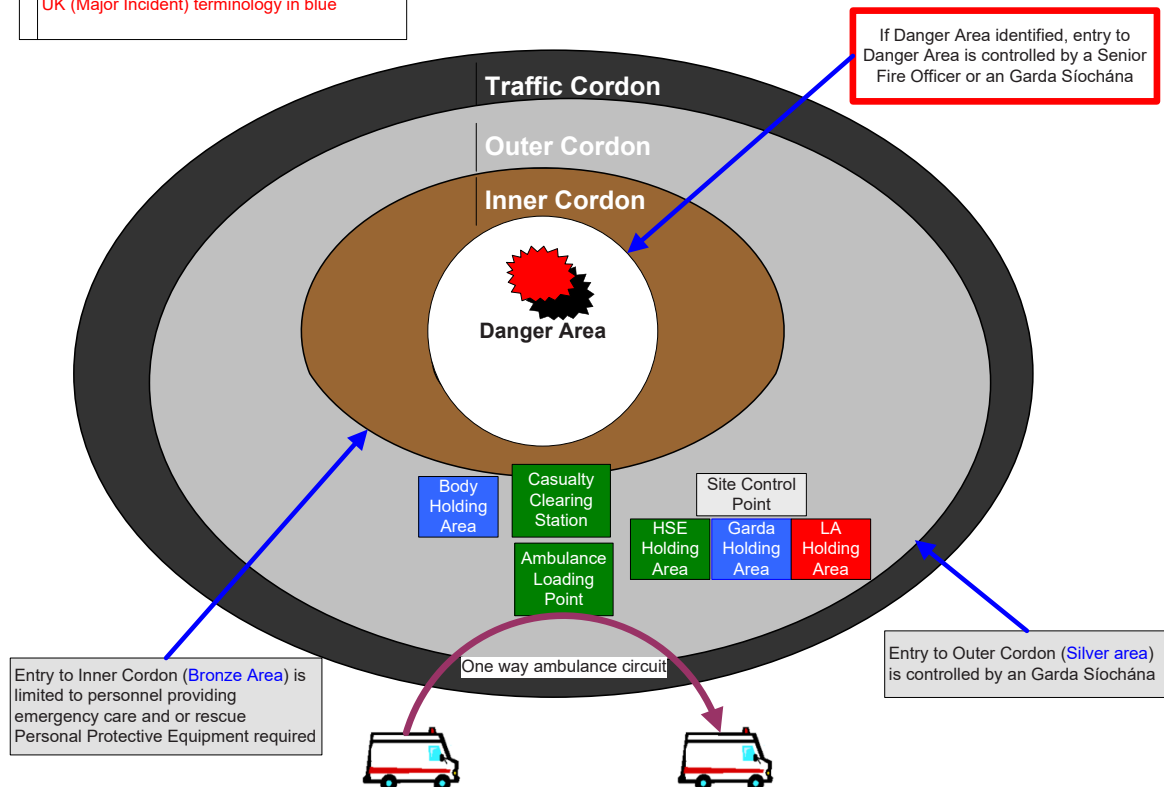
4/5/6.8.2
Version 2, 01/2013

Major Emergency (Major Incident) – Operational Control

EMT P

AP

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



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

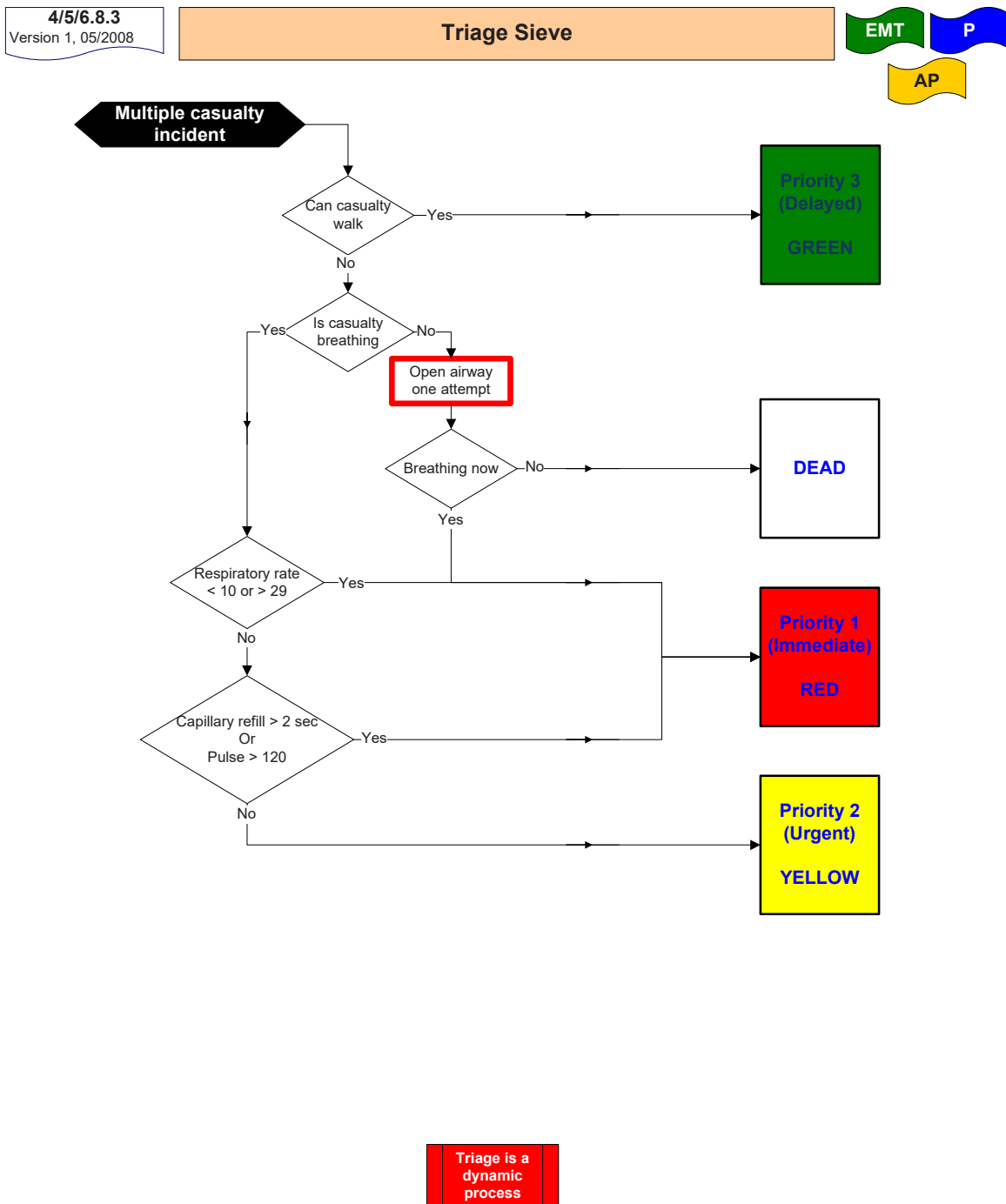
Other management functions for;
Major Emergency site
Casualty Clearing Officer
Triage Officer
Ambulance Parking Point Officer
Ambulance Loading Point Officer
Communications Officer
Safety Officer



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)

SECTION 8 - Pre-Hospital Emergency Care Operations

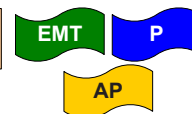


The principles and terminology of Major Incident Medical Management and Support (MIMMS) has been used with the kind permission of the Advanced Life Support Group, UK

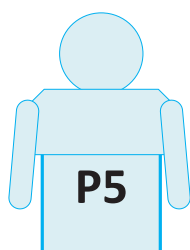
SECTION 8 - Pre-Hospital Emergency Care Operations

4/5/6.8.6
Version 1, 03/2016

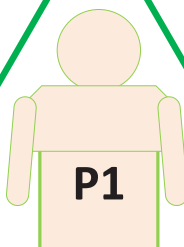
Team Resuscitation



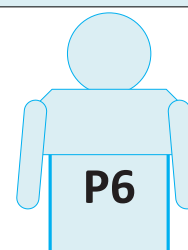
Identification: P5
Role: Family & Team Support
Position: Outside the BLS triangle
1. Family Liaison
2. Patient Hx/meds
3. Manage Equipment
4. Plan removal (if transporting)



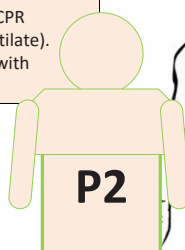
Identification: P1
Role: Airway and ventilatory support & initial team leader
Location: Inside BLS Triangle at patient's head
Tasks:
1. Position defibrillator/monitor.
2. Attach defib pads and operate defibrillator/monitor (If awaiting arrival of P3)
3. Basic airway management (manoeuvre, suction & adjunct)
4. Assemble ventilation equipment and ventilate
5. Insert advanced airway (unsynchronised ventilation and ETCO₂ monitor, if available)
6. Team leader (until P4 assigned)



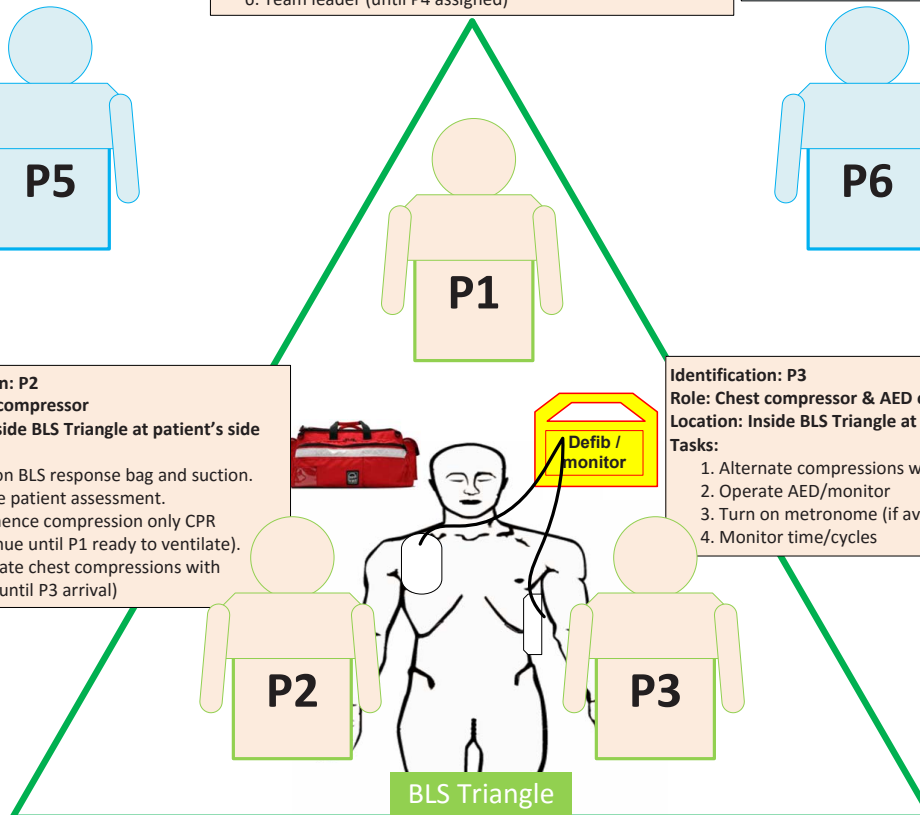
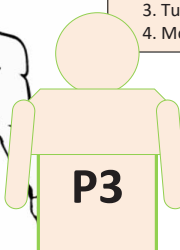
Identification: P6
Role: Team Support
Location: Outside BLS Triangle
Tasks:
1. Support P1 with airway and ventilation.
2. Support P2/P3 with chest compressions and defibrillation
3. Documentation
4. Support tasks assigned by P4



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



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



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

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

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

Reference: ILCOR Guidelines 2015

APPENDIX 1 – Medication Formulary

Medication Formulary for Emergency Medical Technician

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.

APPENDIX 1 – Medication Formulary

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).

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

Paediatric weight estimations acceptable to PHECC are:

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

Pregnancy caution:

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

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

Paramedic authorisation for IV infusion continuation

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

This version contains 13 medications.

Please visit www.phecc.ie for the latest edition/version

APPENDIX 1 – Medication Formulary

Amendments to the Emergency Medical Technician 2014 Edition:

New Medications introduced:

- Chlorphenamine
- Methoxyflurane

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	

Epinephrine (1:1,000)		
Heading	Add	Delete
Administration	(CPG: 2/3.4.15, 4/5/6.4.11, 4/5/6.7.13)	CPG: 4.4.15, 2/3.4.16, 4.7.31
Indications	Stridor, Symptomatic Bradycardia	
Usual Dosages	Adult: EMT 0.5 mg IM Paediatric: EMT < 6 months – 0.05 mg IM 6 months to 5 years – 0.125 mg IM 6 to 8 years – 0.25 mg IM > 8 years – 0.5 mg IM	

Glucagon:		
Heading	Add	Delete
Administration	(CPG: 4/5/6.4.19, 4/5/6.7.32)	CPG: 4.4.19, 4.7.32
Additional Information	Hypoglycaemic paediatrics patients who are not diagnosed as diabetic should not be administered Glucagon (this does not preclude the administration of Glucose gel or Dextrose to treat hypoglycaemia)	

APPENDIX 1 – Medication Formulary

Glucose gel		
Heading	Add	Delete
Administration	(CPG: 4/5/6.4.19, 4/5/6.7.32)	CPG: 4.4.19, 4.7.32

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

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

Oxygen		
Heading	Add	Delete
Usual Dosages	Basic and Advanced Life Support – Neonate (< 4 weeks) Consider supplemental O ₂ (\leq 30%)	

APPENDIX 1 – Medication Formulary

Paracetamol		
Heading	Add	Delete
Presentation	Rectal suppository 1 g, 500 mg, 250 mg, 240 mg, 125 mg, 120 mg, 80 mg Glass vial, 1 g of Paracetamol in 100 mL solution for infusion	180 mg and 60 mg
Indications	Adult: Pyrexia / Temperature > 38.3°C / Minor or moderate pain for adult patients Paediatric: Pyrexia / Temperature > 38.5°C / Minor or moderate pain for paediatric patients	

Salbutamol		
Heading	Add	Delete
Administration	(CPG: 4/5/6.7.12)	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) 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) 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)

APPENDIX 1 – Medication Formulary

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

	Page No.
Aspirin	93
Chlorphenamine	94
Epinephrine 1 mg/1 mL (1:1,000)	95
Glucagon	96
Glucose gel	97
Glyceryl trinitrate	98
Ibuprofen	99
Methoxyflurane	100
Naloxone	101
Nitrous Oxide 50% and Oxygen 50% (Entonox)	102
Oxygen	103
Paracetamol	104
Salbutamol	105

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 A ₂ , 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:



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	<p>Adult: <i>Allergic reaction</i> Mild: - 4 mg PO (EMT / P / AP). Moderate: - 4 mg PO or 10 mg IM (EMT / P) or 10 mg IV (AP). Severe/Anaphylaxis: - 10 mg IM (EMT / P) or 10 mg IV (AP).</p> <p>Paediatric: <i>Allergic reaction:</i> Mild: 6 to 11 years – 2 mg PO (EMT / P / AP). ≥ 12 years – 4 mg PO (EMT / P / AP).</p> <p>Moderate: < 1 year – 0.25 mg/Kg IM (EMT / P) or 0.25 mg/Kg IV (AP). 1 to 5 years – 2.5 mg IM (EMT / P) or 2.5 mg IV (AP). 6 to 11 years – 2 mg PO or 5 mg IM (EMT / P) or 5 mg IV (AP). ≥ 12 years – 4 mg PO or 10 mg IM (EMT / P) or 10 mg IV (AP).</p> <p>Severe / Anaphylaxis: < 1 year – 0.25 mg/Kg IM (EMT / P) or 0.25 mg/Kg IV (AP). 1 to 5 years – 2.5 mg IM (EMT / P) or 2.5 mg IV (AP). 6 to 11 years – 5 mg IM (EMT / P) or 5 mg IV (AP). ≥ 12 years – 10 mg IM (EMT / P) or 10 mg IV (AP).</p>
Pharmacology / Action	Chlorphenamine is a potent antihistamine (H 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%.

APPENDIX 1 – Medication Formulary

Clinical level:



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 (for EMT use). 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	<p>Anaphylaxis Adult: 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).</p> <p>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)</p> <p>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).</p> <p>Stridor (AP): < 1 Year: 2.5 mg NEB ≥ 1 year: 5 mg NEB (repeat after 30 minutes prn) (AP).</p> <p>Adult (AP): 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).</p>
Pharmacology / Action	<p>Alpha and beta adrenergic stimulant: Reversal of laryngeal oedema and bronchospasm in anaphylaxis. Antagonises the effects of histamine.</p>
Side effects	Palpitations / Tachyarrhythmias / Hypertension / Angina-like symptoms.
Additional information	N.B. Double check the concentration on pack before use.

APPENDIX 1 – Medication Formulary

Clinical level:



Medication	Glucagon
Class	Hormone and Antihypoglycaemic.
Descriptions	Glucagon is a protein secreted by the alpha cells of the Islets of Langerhans in the pancreas. It is used to increase the blood glucose level in cases of hypoglycaemia in which an IV cannot be immediately placed.
Presentation	1 mg vial powder and solution for reconstitution (1 mL).
Administration	Intramuscular (IM). (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	Known severe adverse reaction / Pheochromocytoma.
Usual Dosages	Adult: 1 mg IM. Paediatric: ≤ 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 paediatric patients who are not diagnosed as diabetic should not be administered Glucagon (this does not preclude the administration of Glucose gel or Dextrose to treat hypoglycaemia).

APPENDIX 1 – Medication Formulary

Clinical level:    

Medication	Glucose gel
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.

APPENDIX 1 – Medication Formulary

Clinical level:



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

APPENDIX 1 – Medication Formulary

Clinical level:



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). (<i>CPG</i> : 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.
Pharmacology / Action	Suppresses prostaglandins, which cause pain via the inhibition of cyclooxygenase (COX). Prostaglandins are released by cell damage and inflammation.
Side effects	Skin rashes / Gastrointestinal intolerance and bleeding.
Long term side effects	Occasional gastrointestinal bleeding and ulceration can occur. May also cause acute renal failure / Interstitial nephritis / NSAID-associated nephropathy.
Additional information	If Ibuprofen administered in previous 6 hours, adjust the dose downward by the amount given by other sources resulting in a maximum of 10 mg/Kg. Caution with significant burns or poor perfusion due to risk of kidney failure. Caution if on oral anticoagulant (e.g. Warfarin, Rivaroxaban, Apixaban, Edoxaban) due to increased bleeding risk. Ibuprofen may be combined with Paracetamol for synergic effect.

APPENDIX 1 – Medication Formulary

Clinical Level:



Medication	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). (<i>CPG</i> : 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. Known severe adverse reaction.
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. <u>Do not</u> use in patients with renal impairment or renal failure. Contains butylated hydroxytoluene (E321) as a stabiliser. Methoxyflurane has a mildly pungent odour. If used in a confined space request the patient to inhale and exhale through the inhaler tube while ensuring that the activated Carbon Chamber is attached.

APPENDIX 1 – Medication Formulary

Clinical Level:



Medication	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.

APPENDIX 1 – Medication Formulary

Clinical Level:



Medication	Nitrous Oxide 50% and Oxygen 50% (Entonox®)
Class	Analgesic.
Descriptions	Potent analgesic gas contains a mixture of both Nitrous Oxide and Oxygen.
Presentation	Cylinder, coloured blue with white and blue triangles on cylinder shoulders. 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.

APPENDIX 1 – Medication Formulary

Clinical Level:    

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.

APPENDIX 1 – Medication Formulary

Clinical Level:



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

APPENDIX 1 – Medication Formulary

Clinical Level:



Medication	Salbutamol
Class	Sympathetic agonist.
Descriptions	Sympathomimetic that is selective for beta-2 adrenergic receptors.
Presentation	Nebule 2.5 mg in 2.5 mL. Nebule 5 mg in 2.5 mL. <i>Aerosol inhaler:</i> Metered dose 0.1 mg (100 mcg).
Administration	NEB. Inhalation via aerosol inhaler. (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 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 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.

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 Extrication				✓ SA	✓	✓	✓
Secure and move a patient with an extrication device				✓ SA	✓	✓	✓
Move a patient with a split device (Orthopaedic stretcher)				✓ SA	✓	✓	✓
Passive Spinal Motion Restriction						✓	✓

APPENDIX 2 – Medications & Skills Matrix

TRAUMA (contd.)

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

OTHER

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

PATIENT ASSESSMENT

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

APPENDIX 2 – Medications & Skills Matrix

PATIENT ASSESSMENT (contd.)

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

APPENDIX 3 – Critical Incident Stress Management

Your Psychological Well-Being

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

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

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

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

SOME DOS AND DON'TS

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

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

WHEN TO FIND HELP

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

APPENDIX 3 – Critical Incident Stress Management

Experiencing signs of excessive stress?

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

Where to find help?

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

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

- For a self-help guide, please go to www.cismnetworkireland.ie
- 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 Emergency Medical Technicians

New EMT 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 4/5/6.5.3 PV Haemorrhage in Pregnancy	This CPG combines AP, P and EMT practice on one CPG.
CPG 4/5/6.5.4 Postpartum Haemorrhage	This CPG combines AP, P and EMT practice on one CPG.
CPG 4/5/6.5.5 Umbilical Cord Complications	This CPG combines AP, P and EMT practice on one CPG.

Deleted EMT CPGs in 2017 Edition

CPG Deleted	
CPG 4.7.52 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 4.6.9.
CPG 4.4.15 Allergic Reaction/Anaphylaxis – Adult	This CPG has been deleted. All three practitioner levels are now incorporated into one CPG 4/5/6.4.15 Allergic Reaction/Anaphylaxis – Adult.
CPG 4.4.19 Glycaemic Emergency – Adult	This CPG has been deleted. All three practitioner levels are now incorporated into one CPG 4/5/6.4.19 Glycaemic Emergency – Adult.

APPENDIX 4 – CPG Updates for Emergency Medical Technicians

Updated EMT CPGs from 2014 version

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

Practitioners should also be advised that there are updated care principles in this edition. In an attempt to reduce unnecessary content on CPGs the list of equipment has been deleted from all CPGs.

CPGs	The principal differences are:
CPG 4/5/6.2.6 Pain Management – Adult	<p>The CPG layout has been changed significantly</p> <p>Deleted</p> <p>‘And/or’ - for Paracetamol and Ibuprofen for moderate pain</p> <p>Scores depicting severe, moderate and mild pain</p> <p>Added</p> <p>‘Consider medical support’</p> <p>Pathway to nausea & vomiting CPG</p> <p>Management of severe pain classified into 1st, 2nd and 3rd line administration of analgesia</p> <p>Methoxyflurane 3 mL INH for moderate pain</p> <p>Medication updates</p> <p>Ibuprofen for mild pain</p> <p>Ibuprofen dose increased to 600 mg PO for moderate pain in conjunction with Paracetamol 1 g PO</p>
CPG 4/5/6.3.4 Asthma – Adult	<p>Medication update</p> <p>Salbutamol aerosol 0.1 mg repeat increased from 5 to 11 times</p>
CPG 4/5/6.4.1 Basic Life Support – Adult	<p>Deleted</p> <p>‘Commence CPR while defibrillator is being prepared only if 2nd person available’</p> <p>Chest compression depth: at least 5 cm</p> <p>Added</p> <p>‘Commence continuous chest compressions (or CPR) while defibrillator is being prepared’</p> <p>1 practitioner on site = continuous chest compressions</p> <p>2 or more practitioners / responders on site = CPR</p> <p>Chest compression depth: 5 to 6 cm</p> <p>Oxygen therapy de-emphasised during initial resuscitation to minimise chest compression delay</p>
CPG 4/5/6.4.3 VF or pVT – Adult	<p>Renamed from ‘VF or Pulseless VT – Adult’ to ‘VF or pVT – Adult’</p> <p>Deleted</p> <p>Driving graphic and information box regarding mechanical CPR device</p>

APPENDIX 4 – CPG Updates for Emergency Medical Technicians

CPGs	The principal differences are:
CPG 4.4.4 Asystole – Adult	<p>Deleted</p> <p>Driving graphic and information box regarding CPR hands-off time</p> <p>Consider waveform capnography</p> <p>Added</p> <p>100% Oxygen</p> <p>‘Contact ambulance control and identify timeframe for arrival of P or AP and follow direction re transport’ – information box</p> <p>EMT special authorisation – ‘An EMT may cease resuscitation, following 20 minutes of asystole and no P or AP available, provided that the EMT is privileged to do so by the licensed CPG provider on whose behalf he/she is acting’</p>
CPG 4/5/6.4.6 Pulseless Electrical Activity – Adult	<p>Deleted</p> <p>Driving graphic and information box regarding mechanical CPR device</p> <p>Information box regarding CPR hands-off time</p>
CPG 4.4.7 Post-Resuscitation Care – Adult	<p>Deleted</p> <p>‘Positive pressure ventilations’ mandatory box</p> <p>Titrate O₂ to 94% - 98%</p> <p>Consider active cooling if unresponsive</p> <p>Recovery position</p> <p>Added</p> <p>‘Airway’ to first decision box</p> <p>‘Consider advanced airway and positive pressure ventilations’</p> <p>‘Avoid warming’</p>
CPG 4.4.10 Cardiac Chest Pain – Acute Coronary Syndrome	<p>Deleted</p> <p>‘Time critical commence transport to definitive care ASAP’ – information box</p> <p>Added</p> <p>‘Contact NAS control for direction’</p> <p>Medication update</p> <p>Oxygen therapy has been changed to ‘consider oxygen therapy’</p>
CPG 4/5/6.4.15 Allergic Reaction/Anaphylaxis – Adult	<p>The algorithm flow through the CPG has been modified extensively</p> <p>Deleted</p> <p>‘Angio-oedema’ from mild allergic signs</p> <p>Added</p> <p>EMT level – all three practitioner levels now combined</p> <p>‘Effective’ to pre-arrival Epinephrine decision diamond</p> <p>‘Angio-oedema’ to moderate allergic signs</p> <p>New Medications</p> <p>Epinephrine (1:1,000) 0.5 mg IM</p> <p>Chlorphenamine PO/IM</p>

APPENDIX 4 – CPG Updates for Emergency Medical Technicians

CPGs	The principal differences are:
CPG 4/5/6.4.19 Glycaemic Emergency – Adult	<p>The algorithm flow through the CPG has been modified</p> <p>Deleted</p> <p>'A or V on AVPU' – decision diamond</p> <p>Added</p> <p>EMT level – all three practitioner levels now combined</p> <p>'Conscious/able to swallow' – decision diamond</p> <p>Yes - Glucose gel 10 - 20 g buccal, sweetened drink</p> <p>No - Dextrose or Glucagon 1 mg IM</p> <p>'Advise a carbohydrate meal (sandwich)'</p>
CPG 4/5/6.4.24 Sepsis – Adult	<p>Deleted</p> <p>Commence with 100% O₂</p> <p>Added</p> <p>'advise triage nurse if SIRS + infection'</p> <p>'On immune-suppressant medication' – Could this be severe infection?</p> <p>'BP monitoring'</p> <p>O₂ titrate to sats > 94%</p> <p>Risk stratifier instruction box</p> <p>Penicillin allergy instruction box</p> <p>Pre-alert ED updated with criteria; severe sepsis, septic shock, meningitis suspected or at risk of neutropenia</p> <p>Indications for antibiotic; severe sepsis, septic shock, meningitis suspected or at risk of neutropenia</p> <p>Signs of shock/poor perfusion updated to include; heart rate > 130, RR > 30, altered mental status and oligo or anuria</p> <p>Medication update</p> <p>38.3°C new temperature for consideration for Paracetamol</p>
CPG 4/5.4.29 Mental Health Emergency	<p>The wording of the CPG entry point updated to read; 'abnormal behaviour with a history of psychiatric illness'</p> <p>Added</p> <p>Capacity assessment updated to reflect Assisted Decision Making (Capacity) Act 2015 requirements</p>
CPG 4/5/6.4.30 Behavioural Emergency	<p>The algorithm flow through the CPG has been modified extensively</p> <p>Deleted</p> <p>'Saloon of ambulance' to reflect other modes of transport when considering two or more people accompanying the patient</p> <p>Added</p> <p>Capacity assessment updated to reflect Assisted Decision Making (Capacity) Act 2015 requirements</p>

APPENDIX 4 – CPG Updates for Emergency Medical Technicians

CPGs	The principal differences are:
CPG 4/5/6.4.30 Behavioural Emergency (Contd.)	<p>Three potential causes of behavioural emergency; mental health, medical or traumatic causation and intoxication or withdrawal</p> <p>Decision diamond for patients 'aggressive/violent and/or risk to self or others and uncooperative with practitioner'</p> <p>For patients who are aggressive/violent and/or risk to self or others and uncooperative with practitioner;</p> <ul style="list-style-type: none"> • 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
CPG 4.5.1 Pre-Hospital Emergency Childbirth	<p>Added</p> <p>Clamp & cut cord</p> <p>'Preference for skin to skin' (when wrapping baby and presenting to mother)</p>
4.5.2 Basic Life Support – Neonate (< 4 weeks)	<p>Deleted</p> <p>Give supplementary O₂</p> <p>Added</p> <p>Record time of birth</p> <p>Following birth, all elements up to the 'provision of 5 positive pressure ventilations' to be completed within 60 seconds</p> <p>ECG monitor to assess heart rate</p> <p>'Gasping breaths' added to 'apnoeic or HR < 100'</p> <p>'(room air)' - Provide 5 positive pressure ventilations</p> <p>30 second PPV (40 - 60 breaths per minute) - until breathing well, HR > 100</p> <p>If ongoing CPR consider supplemental O₂ (≤ 30%)</p> <p>'Monitor heart rate' decision diamond changed from 'assess heart rate'</p> <p>'Use two thumbs encircling technique when two practitioners present' – information box</p> <p>Contact ambulance control for direction</p>
CPG 4/5/6.6.6 Heat Related Emergency – Adult	<p>Deleted</p> <p>'Exercise related dehydration should be treated with oral fluids (caution with over-hydration with water)'</p>

APPENDIX 4 – CPG Updates for Emergency Medical Technicians

CPGs	The principal differences are:
CPG 4/5/6.7.4 Secondary Survey – Paediatric (≤ 15 years)	<p>Deleted</p> <p>‘Check for normal patterns of feeding, toilet, sleeping, interaction with guardian’</p> <p>Head-to-toe examination list</p> <p>Added</p> <p>Take SAMPLE history</p> <p>Irish Children’s Triage System normal range of vital signs</p>
CPG 4/5/6.7.5 Pain Management – Paediatric (≤ 15 years)	<p>The CPG layout has been changed significantly</p> <p>Deleted</p> <p>‘And/or’ - for Paracetamol and Ibuprofen for moderate pain</p> <p>Scores depicting severe, moderate and mild pain</p> <p>Added</p> <p>‘Consider medical support’</p> <p>Pathway to nausea & vomiting CPG</p> <p>Management of severe pain classified into 1st, 2nd and 3rd line administration of analgesia</p> <p>Request ALS if pain management is not resolved</p> <p>Methoxyflurane 3 mL INH for moderate pain (≥ 5 year olds)</p> <p>Medication updates</p> <p>Ibuprofen 10 mg/Kg PO for mild pain</p> <p>Ibuprofen 10 mg/Kg PO in conjunction with Paracetamol 20 mg/Kg PO for moderate pain</p>
CPG 4/5/6.7.13 Stridor – Paediatric (≤ 15 years)	<p>‘Humidified O₂’ and ‘Do not distress’ moved to earlier in the treatment algorithm</p> <p>Added</p> <p>‘Request ALS’</p> <p>‘Check temperature and if > 38.5°C - go to Sepsis CPG’</p>
CPG 4/5/6.7.20 Basic Life Support – Paediatric (≤ 15 years)	<p>Deleted</p> <p>‘Minimum interruption of chest compressions’ - information box</p> <p>‘Continue CPR while defibrillator is charging’ - information box</p> <p>‘Minimal interruptions of chest compressions and maximum hands-off time 10 seconds’ - information box</p> <p>Added</p> <p>‘Chest compression depth of 5 cm for a child and 4 cm for a small child or infant’ - information box</p>
CPG 4/5/6.7.22 VF or pVT – Paediatric (≤ 15 years)	<p>Renamed from ‘VF or Pulseless VT – Paediatric (≤ 15 years)’ to ‘VF or pVT – Paediatric (≤ 15 years)’</p>

APPENDIX 4 – CPG Updates for Emergency Medical Technicians

CPGs	The principal differences are:
CPG 4/5/6.7.22 VF or pVT – Paediatric (≤ 15 years) (Contd.)	<p>Deleted</p> <p>‘With CPR ongoing maximum hands-off chest 10 seconds and CPR during charging’ - information box</p> <p>‘Transport to ED if no change after 10 minutes resuscitation if no ALS available’</p> <p>Driving graphic</p> <p>‘Mechanical CPR device’ - information box</p> <p>Added</p> <p>‘100% Oxygen’</p> <p>‘Transport to ED if no change after 20 minutes resuscitation if no ALS available’</p>
CPG 4/5/6.7.23 Asystole/PEA – Paediatric (≤ 15 years)	<p>Deleted</p> <p>‘With CPR ongoing maximum hands-off chest 10 seconds and CPR during charging’ - information box</p> <p>‘Transport to ED if no change after 10 minutes resuscitation if no ALS available’</p> <p>Driving graphic</p> <p>‘Mechanical CPR device’ - information box</p> <p>Added</p> <p>‘100% Oxygen’</p> <p>‘Transport to ED if no change after 20 minutes resuscitation if no ALS available’</p>
CPG 4.7.25 Post-Resuscitation Care – Paediatric (≤ 15 years)	<p>Deleted</p> <p>Consider active cooling if unresponsive</p> <p>Recovery position</p> <p>Added</p> <p>‘Prevent warming’</p> <p>Contact NAS ambulance control for direction</p>
CPG 4/5/6.7.31 Allergic Reaction/Anaphylaxis – Paediatric (≤ 15 years)	<p>The algorithm flow through the CPG has been modified extensively</p> <p>Deleted</p> <p>‘Angio-oedema’ from mild allergic signs</p> <p>Added</p> <p>EMT level – all three practitioner levels now combined</p> <p>‘Effective’ to pre-arrival Epinephrine decision diamond</p> <p>‘Angio-oedema’ to moderate allergic signs</p> <p>New Medications</p> <p>Epinephrine (1:1,000) (age specific dose) IM</p> <p>Chlorphenamine (age specific dose) PO/IM</p>

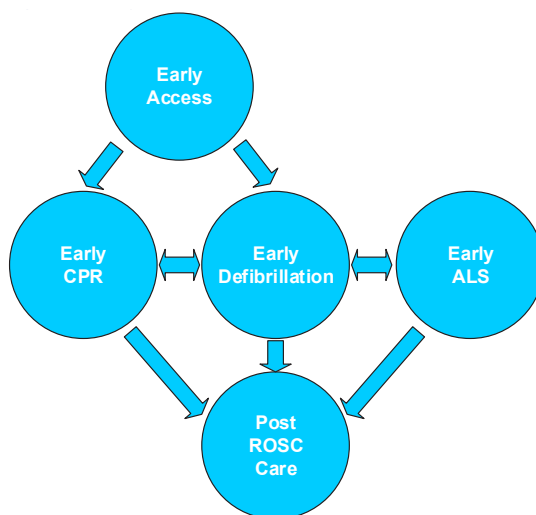
APPENDIX 4 – CPG Updates for Emergency Medical Technicians

CPGs	The principal differences are:
CPG 4/5/6.7.32 Glycaemic Emergency – Paediatric (≤ 15 years)	<p>The algorithm flow through the CPG has been modified</p> <p>Deleted 'A or V on AVPU' – decision diamond</p> <p>Added EMT level – all three practitioner levels now combined 'Conscious/able to swallow' – decision diamond Yes - Glucose gel 10 - 20 g buccal, sweetened drink No - Dextrose or Glucagon 1 mg IM 'Advise a carbohydrate meal (sandwich)'</p>
CPG 4/5/6.7.35 Pyrexia – Paediatric	<p>Deleted Temperature ≥ 38°C – decision diamond</p> <p>Added Temperature > 38.5°C – decision diamond</p>
CPG 4/5/6.7.50 External Haemorrhage – Paediatric (≤ 15 years)	<p>Added 'Consider wound closure clips for temporary closure if still bleeding' – AP, P & EMT-BTEC level</p>

APPENDIX 5 – Pre-Hospital Defibrillation Position Paper

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

Cardiac arrest management process



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

Position

1. Defibrillation mode

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

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

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

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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 relate to EMTs. The full details are published in STN024 and are available on the PHECC website www.phecc.ie

As all recommendations do not apply to EMTs only the EMT recommendations are published herein.

Recommendations

Practitioners at Emergency Medical Technician (EMT) level

Recommendation 1

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

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

Recommendation 2

Following trauma should any of the following factors be present:

- dangerous mechanism of injury
- fall from a height of greater than 1 metre or 5 steps
- axial load to the head or base of the spine – for example diving, high-speed motor vehicle collision, rollover motor accident, ejection from a motor vehicle, accident involving motorised recreational vehicle, bicycle collision, horse riding accident, pedestrian v vehicle
- impaired awareness (alcohol/drug intoxication, confused/uncooperative or ALoC)
- age 65 years or older, with any of the above
- age 2 years or younger, incapable of verbal communication, with any of the above

the patient should be regarded as 'high risk' and have active spinal motion restriction applied until assessment is complete.

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

APPENDIX 6 – Spinal Injury Management Recommendations

Recommendation 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.

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 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 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.

APPENDIX 6 – Spinal Injury Management Recommendations

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.

Recommendation 21

EMTs shall provide active spinal motion restriction for all patients with 'high risk' or 'low risk' factors present even in the absence of any of the 'spinal injury rule in' considerations.

The aim of recommendation 21 is to differentiate the scope of practice between EMTs and other PHECC practitioners.

EMT level	Mechanism of injury	
	High Risk	Low Risk
'Spinal injury rule in' considerations	Active SMR	Active SMR
No 'spinal injury rule in' considerations	Active SMR	Active SMR

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