APPENDIX 1
MEDICATION FORMULARY

Amendments to the 2012 Edition

The paediatric age range has been increased to reflect the HSE National Clinical Programme for Paediatrics and Neonatology age profile:

A paediatric patient is defined as a patient up to the eve of his/her 16th birthday (≤ 15 years).

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

The paediatric weight estimation formulae have been modified.

New Medications introduced;

- Dextrose 5%
- Fentanyl
- Ticagrelor
- Tranexamic Acid

Medications withdrawn for Advanced Paramedic use but continued for pre-hospital medical practitioner use;

- Enoxaparin Sodium Solution
- Tenecteplase Powder for injection

Amiodarone		
HEADING	ADD	DELETE
Indications	Symptomatic Tachycardia (> 150)	
Usual Dosages	Symptomatic Tachycardia: 150 mg IV (infusion in 100 mL D_5W)	
Additional information	(for infusion use 100 mL D_5W) For cardiac arrest do not dilute, administer directly followed by a flush	

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Atropine

HEADING	ADD	DELETE
Indications	Cholinergic poison with bradycardia and salivation	Paediatric (CPG not published) Organophosphate poison.
Contraindications	Post-cardiac transplantation.	
Usual Dosages	Symptomatic Bradycardia: 0.6 mg (600 mcg) IV	Symptomatic Bradycardia – 0.5 mg (500 mcg) IV
Additional information		Organophosphate poison

Benzylpenicillin

HEADING	ADD	DELETE
Indications	Severe sepsis - Adult Suspected or confirmed meningococcal sepsis - Paediatric	

Clopidogrel

HEADING	ADD	DELETE
Indications	ST Elevation Myocardial Infarction (STEMI) if the patient is not suitable for PPCI	Identification of ST Elevation Myocardial Infarction (STEMI)
Usual Dosages	300 mg PO ≥ 75 years	600 mg PO > 75 years
Additional information		Paramedics are authorised to administer Clopidogrel PO following identification of STEMI and medical practitioner instruction

Enoxaparin Sodium Solution

HEADING	ADD	DELETE
Clinical Level	MP	AP
Usual Dosages	**Adult Dosage** (> 75 years: 0.75 mg/Kg SC)	

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Epinephrine (1:1,000)

HEADING	ADD	DELETE
Usual Dosages	Auto-injector	EpiPen® Jr

Furosemide

HEADING	ADD	DELETE
Usual Dosages	Slow IV	

Hartmann's Solution

HEADING	ADD	DELETE
Usual Dosages	See NaCl	Adult: Anaphylaxis; 1000 mL IV/IO infusion, repeat x one Decompression illness; 500 mL IV/IO infusion. Shock; 500 mL IV/IO infusion. Repeat in aliquots of 250 mL prn to maintain systolic BP of; 100 mmHg (hypovolaemia or septic). 90 – 100 mmHg (head injury GCS > 8) 120 mmHg (head injury GCS ≤ 8 mmHg) Paediatric: Anaphylaxis; 20 mL/Kg IV/IO infusion, repeat x one Haemorrhagic shock; 10 mL/Kg IV/IO, repeat prn if signs of inadequate perfusion.

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Hydrocortisone

HEADING	ADD	DELETE
Indications	Adrenal insufficiency Asthma refractory to Salbutamol and Ipratropium Bromide	Patients with asthma following an anaphylactic reaction
Usual Dosages	**Adult:** **Anaphylactic reaction and Exacerbation of COPD (AP);** 200 mg IV (infusion in 100 mL NaCl) or IM **Asthma (AP) and Adrenal insufficiency (P & AP);** 100 mg IV (infusion in 100 mL NaCl) or IM **Paediatric:** **Anaphylactic reaction and Asthma (AP);** < 1 year: 25 mg IV (infusion in 100 mL NaCl) or IM 1 to 5 years: 50 mg IV (infusion in 100 mL NaCl) or IM > 5 years: 100 mg IV (infusion in 100 mL NaCl) or IM **Adrenal insufficiency (P & AP);** 6 mths to ≤ 5 years: 50 mg IV (infusion in 100 mL NaCl) or IM > 5 years : 100 mg IV (infusion in 100 mL NaCl) or IM	Adult: 200 mg IM or slow IV (over 1 to 10 minutes) Paediatric: < 1 year 25 mg IM or slow IV (over 1 to 10 minutes) 1 to 5 years 50 mg IM or slow IV (over 1 to 10 minutes) 6 to 12 years 100 mg IM or slow IV (over 1 to 10 minutes) >12 years 130 mg IM or slow IV (over 1 to 10 minutes)
Pharmacology/action		The half life is 90 minutes.
Additional information	IV is the preferred route for adrenal crisis	

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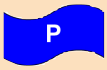
Ibuprofen

HEADING	ADD	DELETE
Clinical Level		
Presentation	400 mg tablet	
Description	It is an anti-inflammatory analgesic	It is used to reduce mild to moderate pain
Additional information	Caution with significant burns or poor perfusion due to risk of kidney failure Caution if concurrent NSAIDs use	

Ipratropium Bromide

HEADING	ADD	DELETE
Clinical Level		
Administration	CPG: 4/5/6.3.3, 4/5/6.3.4, 4/5/6.7.18	CPG: 5/6.3.2, 5/6.7.5
Usual Dosages	**Paediatric** < 12 years: 0.25 mg NEB ≥ 12 years: 0.5 mg NEB	Paediatric 0.25 mg NEB

Lidocaine

HEADING	ADD	DELETE
Indications	...for VF/VT arrests	

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Magnesium Sulphate

HEADING	ADD	DELETE
Indications	Seizure associated with eclampsia	
Usual Dosages	**Adults:** **Torsades de pointes:** 2 g IV/IO (infusion in 100 mL NaCl) **Persistent bronchospasm:** 2 g IV/IO (infusion in 100 mL NaCl) **Seizure:** 4 g IV (infusion in 100 mL NaCl)	Adults: Torsades de pointes: 2 g IV/IO infusion over 15 minutes Persistent bronchospasm: 1.5 g IV/IO infusion over 20 minutes Dilute in 100 mL NaCl for infusion

Midazolam Solution

HEADING	ADD	DELETE
Administration	2.5 mg in 0.5 mL pre-filled syringe 5 mg in 1 mL pre-filled syringe 7.5 mg in 1.5 mL pre-filled syringe 10 mg in 2 mL pre-filled syringe	
Indications	Compatitive with hallucinations or paranoia and risk to self or others.	Psychostimulant overdose Hallucinations or paranoia
Usual Dosages	**Seizure & Combative Patient:** < 1 year: 2.5 mg buccal 1 year to < 5 years: 5 mg buccal 5 years to < 10 years: 7.5 mg buccal ≥ 10 years: 10 mg buccal	Paediatric: Seizure: 0.5 mg/Kg buccal Psychostimulant overdose: 2.5 mg IV or 5 mg IM (Repeat x 2 prn). Hallucinations or paranoia: 5 mg IV/IM
Additional information	No more than two doses by practitioners. Practitioners should take into account the dose administered by caregivers prior to arrival of practitioner	The maximum dose of Midazolam includes that administered by caregiver prior to arrival of Practitioner

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Morphine Sulphate

HEADING	ADD	DELETE
Contraindications	Acute intoxication	Brain injury Acute alcoholism Migraine
Usual Dosages	**Adult:** Severe pain (≥ 7 on pain scale) **Paediatric:** Severe pain (≥ 7 on pain scale)	Adult: Severe pain (≥ 5 on pain scale) Paediatric: Severe pain (≥ 6 on Wong Baker scale)
Additional information	Caution with reduced GCS Not recommended for headache	

Naloxone

HEADING	ADD	DELETE
Clinical level	EMT	
Administration	Intranasal (IN). CPG: 6.4.23, 4/5.4.23, 4/5/6.7.5	CPG: 5/6.3.2, 5/6.7.5
Indications	Inadequate respiration and/or ALoC following known or suspected narcotic overdose.	Respiratory rate < 10 secondary to known or suspected narcotic overdose
Usual Dosages	**Adult:** 0.8 mg (800 mcg) IN (EMT) **Paediatric:** 0.02 mg/Kg (20 mcg/Kg) IN (EMT)	(Paramedic repeats by one prn)

Nitrous Oxide 50% and Oxygen 50% (Entonox®)

HEADING	ADD	DELETE
Additional information	Caution when using Entonox for greater than one hour for Sickle Cell Crisis	

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Oxygen

HEADING	ADD	DELETE
Contraindications		Paraquat poisoning
Indications	Sickle Cell Disease - 100%	
Additional Information	Caution with paraquat poisoning, administer oxygen if SpO_2 < 92%	

Paracetamol

HEADING	ADD	DELETE
Presentation	250 mg in 5 mL	
Indications	Pyrexia	Pyrexia following seizure for paediatric patients Advanced Paramedics may administer Paracetamol, in the absence of a seizure for the current episode, provided the paediatric patient is pyrexial and has a previous history of febrile convulsions
Contraindications	< 1 month old	
Usual Dosages	> 1 month < 1 year - 90 mg PR	< 1 year - 60 mg PR

Salbutamol

HEADING	ADD	DELETE
Administration		Advanced Paramedics may repeat Salbutamol x 3
Usual Dosages	**Adult:** .. (or 0.1 mg metered aerosol spray x 5) Repeat at 5 min prn (**EFRs**: 0.1 mg metered aerosol spray x 2) **Paediatric:** < 5 yrs...(or 0.1 mg metered aerosol spray x 3) ≥ 5 yrs...(or 0.1 mg metered aerosol spray x 5) Repeat at 5 min prn (**EFRs**: 0.1 mg metered aerosol spray x 2)	Adult: Repeat at 5 min prn (APs x 3 and Ps x 1) (EMTs & EFRs: 0.1 mg metered aerosol spray x 2) Paediatric: Repeat at 5 min prn (APs x 3 and Ps x 1) (EMTs & EFRs: 0.1 mg metered aerosol spray x 2)

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Sodium Bicarbonate

HEADING	ADD	DELETE
Indications	Cardiac arrest following harness induced suspension trauma	
Usual Dosages	Max 50 mEq (50 mL 8.4%)	

Sodium Chloride 0.9%

HEADING	ADD	DELETE
Usual Dosages	**Adult:** **Suspension Trauma, PEA or Asystole:** 20 mL/Kg IV/IO infusion **Adrenal insufficiency:** 1,000 mL IV/IO infusion **Heat Related Emergency:** 1,000 mL IV/IO infusion **Hypothermia, Sepsis, # neck of femur and Bradycardia:** ...Repeat to max 1 L. **Post-resuscitation care:** 1,000 mL IV/IO infusion **Shock from blood loss;** ... to maintain systolic BP of 90 – 100 mmHg **Sickle Cell Crisis:** 1,000 mL IV/IO infusion **# neck of femur, sepsis, symptomatic bradycardia:** 250 mL IV infusion **sepsis with poor perfusion:** 500 mL IV/IO infusion **Paediatric:** **Glycaemic emergency:** 10 mL/Kg IV/IO infusion **Hypothermia:** 10 mL/Kg IV/IO infusion ... Repeat prn x 1 **Adrenal insufficiency, Septic shock, Symptomatic Bradycardia, Asystole/PEA:** 20 mL/Kg IV/IO infusion **Burns:** .... > 1 hour	Adult: Post-resuscitation care: 500 mL IV/IO infusion Shock; 500 mL IV/IO infusion. Repeat in aliquots of 250 mL prn to maintain systolic BP of; 100 mmHg (hypovolaemia or septic). 90 – 100 mmHg (head injury GCS > 8) Paediatric: Glycaemic emergency: 20 mL/Kg IV/IO infusion Hypothermia: 20 mL/Kg IV/IO infusion Shock: 20 mL/Kg IV/IO infusion

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Tenecteplase Powder for Injection		
HEADING	ADD	DELETE
Clinical level	MP	AP
Indications		Less than 75 years old (medical practitioner discretion if > 75 years) MI Symptoms > 20 Min & ≤ 6 hours
Indications	Patient not suitable for PPCI from a time or clinical perspective	Time to PPCI centre > 90 minutes of STEMI confirmation on 12 lead ECG

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LIST OF MEDICATIONS

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CLINICAL LEVEL: AP

Medication	Amiodarone
Class	Antiarrhythmic agent
Descriptions	Class III antiarrhythmic agent used to treat ventricular arrhythmias
Presentation	150 mg in 3 mL solution Pre-filled syringes 10 mL (30 mg/mL)
Administration	Intravenous (IV) Intraosseous (IO) (CPG: 4/5/6.4.3, 5/6.4.7, 5/6.4.12, 4/5/6.7.22)
Indications	Ventricular Fibrillation (VF) and Pulseless Ventricular Tachycardia (VT) Symptomatic Tachycardia (> 150)
Contraindications	Known severe adverse reaction Known hypersensitivity to Iodine
Usual Dosages	**Adult: (CPG)** VF/VT: 5 mg/Kg IV/IO. (Loading dose for cardiac arrest; 300 mg and one supplemental dose 150 mg) Symptomatic tachycardia: 150 mg IV (in 100 mL D_5W) **Paediatric: (CPG)** VF/VT: 5 mg/Kg IV/IO
Pharmacology/Action	**Antiarrhythmic** Prolongs the action potential Prolongs the refractory period Prolongs atrioventricular conduction Prolongs QT interval
Side effects	Inflammation of peripheral veins Bradycardia AV conducting abnormalities
Additional information	If diluted mix with Dextrose 5% (for infusion use 100 mL D_5W) May be flushed with NaCl For adult cardiac arrest do not dilute, administer directly followed by a flush. For ease of use in paediatric calculations when using 150 mg in 3 mL, add 2 mL D_5W, making the concentration 150 mg in 5 mL

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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
Contraindications	Active symptomatic gastrointestinal (GI) ulcer Bleeding disorder (e.g. haemophilia) Known severe adverse reaction Patients < 16 years old
Usual Dosages	**Adult:** 300 mg tablet **Paediatric:** Contraindicated
Pharmacology/Action	**Antithrombotic** Inhibits the formation of thromboxane A2, which stimulates platelet aggregation and artery constriction. This reduces clot/thrombus formation in an MI.
Side effects	Epigastric pain and discomfort Bronchospasm Gastrointestinal haemorrhage
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 anticoagulants 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.

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CLINICAL LEVEL: AP

Medication	Atropine
Class	Anticholinergic (parasympatholytic)
Descriptions	Parasympatholytic (Anticholinergic) that is derived from parts of the Atropa belladonna plant
Presentation	Pre-filled disposable syringe 1 mg/10 mL Ampoule 0.6 mg in 1 mL
Administration	Intravenous (IV) Intraosseous (IO) (CPG: 5/6.3.5, 5/6.4.7, 4/5/6.4.11, 6.4.22)
Indications	**Adult:** Symptomatic bradycardia Cholinergic poison with bradycardia and salivation
Contraindications	Known severe adverse reaction Post-cardiac transplantation
Usual Dosages	**Adult:** **Cholinergic poison with bradycardia and salivation:** 1 mg IV, Repeat at 5 min intervals to ensure minimal salivary secretions **Symptomatic Bradycardia:** 0.6 mg (600 mcg) IV Repeat at 3-5 min intervals to Max 3 mg **Paediatric:** Not indicated
Pharmacology/Action	**Anticholinergic agent** Blocks acetylcholine receptors - enhances SA node automaticity - enhance AV node conduction - increases heart rate
Side effects	Tachycardia Dry mouth Dilated pupils
Additional information	Accidental exposure to the eye causes blurred vision

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CLINICAL LEVEL: AP

Medication	Benzylpenicillin
Class	Antibiotic, Antibacterial
Description	Benzylpenicillin is an antibiotic agent
Presentation	600 mg powder in vial for reconstitution
Administration	Intravenous (IV) or Intraosseous (IO) May give by intramuscular (IM) injection if no IV access **IV/IO:** Reconstitute each 600 mg vial with 4 mL of water for injection and give by slow IV injection (i.e. over 3-5 min) **IM:** Reconstitute each 600 mg vial with 2 mL of water for injection (CPG: 4/5/6.4.24, 5/6.7.34)
Indications	Severe sepsis - Adult Suspected or confirmed meningococcal sepsis - Paediatric
Contraindications	Known severe adverse reaction
Usual Dosages	**Adult:** 1,200 mg IV, IO or IM **Paediatric:** > 8 yrs: 1,200 mg IV, IO or IM 1-8 yrs: 600 mg IV, IO or IM < 1 yr: 300 mg IV, IO or IM
Pharmacology/Action	**Antibacterial** Gram positive cocci antibiotic
Side effects	Gastro intestinal disturbances Hypersensitivity reactions
Additional information	Also called Penicillin G

APPENDIX 1
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CLINICAL LEVEL: P AP

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

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CLINICAL LEVEL: AP

Medication	Cyclizine
Class	Antiemetic
Description	Used in management of nausea & vomiting
Presentation	Ampoule 50 mg in 1 mL
Administration	Intravenous (IV) Intraosseous (IO) (CPG: 4/5/6.2.6, 6.4.26)
Indications	Management, prevention and treatment of nausea & vomiting.
Contraindications	Known severe adverse reaction
Usual Dosages	**Adult:** 50 mg slow IV **Paediatric:** Not indicated
Pharmacology/Action	Anti-emetic
Side effects	Tachycardia Dry Mouth Sedation

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CLINICAL LEVEL: 

Medication	Dextrose 10% Solution
Class	Carbohydrate
Description	Dextrose is used to describe the six-carbon sugar d-glucose, which is the principal form of carbohydrate used by the body. $D_{10}W$ is a hypertonic solution.
Presentation	Soft pack for infusion 250 mL and 500 mL
Administration	Intravenous (IV) infusion/bolus Intraosseous (IO) **Paramedic:** maintain infusion once commenced (CPG: 5/6.4.19, 5/6.7.32)
Indications	Hypoglycaemic emergency Blood glucose level < 4 mmol/L
Contraindications	Known severe adverse reaction
Usual Dosages	**Adult:** 250 mL IV/IO infusion Repeat x 1 prn **Paediatric:** 5 mL/Kg IV/IO Repeat X 1 prn
Pharmacology/Action	Hypertonic glucose solution Dextrose is a readily utilisable energy source
Side effects	Necrosis of tissue around IV access
Additional information	Also called Glucose Cannula patency will reduce the effect of tissue necrosis

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: P AP

Medication	Dextrose 5% Solution
Class	Carbohydrate
Description	Dextrose is used to describe the six-carbon sugar d-glucose, which is the principal form of carbohydrate used by the body. D_5W is a hypertonic solution and is used as an infusion medium for Amiodarone.
Presentation	Soft pack for infusion 100 mL and 500 mL
Administration	Intravenous (IV) infusion Intraosseous (IO) infusion **Paramedic:** maintain infusion once commenced (CPG: May be used for medication dilution on CPGs)
Indications	Use as a dilutant for Amiodarone infusion
Contraindications	Known severe adverse reaction
Usual Dosages	**Adult:** Dilute appropriate dose of Amiodarone in 100 mL or 500 mL **Paediatric:** Not indicated
Pharmacology/Action	Dextrose 5% (D_5W) is used as an infusion medium for the administration of Amiodarone
Side effects	Necrosis of tissue around IV access
Additional information	Paramedics are authorised to continue the established infusion in the absence of an advanced paramedic or doctor during transportation.

APPENDIX 1
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CLINICAL LEVEL: AP

Medication	Diazepam Injection
Class	Benzodiazepine
Description	It is a benzodiazepine that is used to terminate seizures
Presentation	Ampoule 10 mg in 2 mL
Administration	Intravenous (IV) Intraosseous (IO) (CPG: 5/6.4.23, 5/6.7.33)
Indications	Seizure
Contraindications	Known severe adverse reaction Respiratory depression Shock Depressed vital signs or alcohol-related altered level of consciousness
Usual Dosages	**Adult:** 5 mg IV/IO Adult: Repeat x 1 prn **Paediatric:** 0.1 mg/Kg IV/IO Paediatric: Repeat X 1 prn
Pharmacology/Action	Benzodiazepine sedative Inhibits the firing of hyperexcitable neurones through enhancement of the action of the inhibitory transmitter, GABA. This results in CNS depressant, anticonvulsant, sedative and skeletal muscle relaxant effects.
Side effects	**Hypotension** Respiratory depression Drowsiness and lightheadedness (the next day)
Long-term side effects	Confusion and ataxia (especially in the elderly), amnesia, dependence, paradoxical increase in aggression and muscle weakness.
Additional information	Diazepam IV should be titrated to effect The maximum dose of Diazepam includes that administered by carer prior to arrival of Practitioner

APPENDIX 1
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CLINICAL LEVEL: AP

Medication	Diazepam Rectal Solution
Class	Benzodiazepine
Description	It is a benzodiazepine that is used to terminate seizures
Presentation	Rectal tube Available as: 2.5 mg/1.25 mL (2 mg/mL) 5 mg/ 2.5 mL (2 mg/mL) 10 mg/ 2.5 mL (4 mg/mL)
Administration	Per Rectum (PR) (CPG: 5/6.4.23, 5/6.7.33)
Indications	Seizure
Contraindications	Known severe adverse reaction Respiratory depression Shock Depressed vital signs or alcohol-related altered level of consciousness
Usual Dosages	**Adult:** 10 mg PR Repeat x 1 prn Max 20 mg PR **Paediatric:** < 3 years: 2.5 mg PR 3 to 7 years: 5 mg PR ≥ 8 years: 10 mg PR Repeat all x 1 after 5 mins if seizure persists or reoccurs
Pharmacology/Action	**Benzodiazepine sedative** Inhibits the firing of hyperexcitable neurones through enhancement of the action of the inhibitory transmitter, GABA. This results in CNS depressant, anticonvulsant, sedative and skeletal muscle relaxant effects.
Side effects	Hypotension Respiratory depression Drowsiness and lightheadedness (the next day)
Long-term side effects	Confusion and ataxia (especially in the elderly), amnesia, dependence, paradoxical increase in aggression and muscle weakness.
Additional information	Be aware of modesty of patient. Should be administered in the presence of a 2nd person. Egg and soya proteins are used in the manufacture of diazepam rectal solution; allergies to these proteins may be encountered. The maximum dose of Diazepam includes that administered by carer prior to arrival of Practitioner.

APPENDIX 1
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CLINICAL LEVEL: MP

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

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CLINICAL LEVEL: AP

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

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: EFR EMT P AP

Medication	Epinephrine (1:1,000)
Class	Sympathetic agonist
Description	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) (CPG: 5/6.4.15, 4.4.15, 2/3.4.16, 5/6.7.31, 4.7.31, 2/3.7.31)
Indications	Severe anaphylaxis
Contraindications	None known
Usual Dosages	**Adult:** 0.5 mg (500 mcg) IM (0.5 mL of 1: 1,000) **EMT** & (EFR assist patient) 0.3 mg (Auto injector) Repeat every 5 minutes prn **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) **EMT** & (EFR assist patient): 6 months < 10 years; 0.15 mg (Auto injector) ≥ 10 years; 0.3 mg (Auto injector) Repeat every 5 minutes prn
Pharmacology/Action	**Alpha and beta adrenergic stimulant** Reversal of laryngeal oedema & bronchospasm in anaphylaxis Antagonises the effects of histamine
Side effects	Palpitations Tachyarrhythmias Hypertension Angina-like symptoms
Additional information	N.B. Double check the concentration on pack before use

APPENDIX 1
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CLINICAL LEVEL: AP

Medication	Fentanyl
Class	Narcotic analgesic
Description	Synthetic narcotic analgesic with a rapid onset and short duration of action. It has a half-life of 6.5 minutes when IN route is used.
Presentation	Ampoule 100 micrograms in 2 mL. (0.1 mg in 2 mL)
Administration	Intranasal (IN) (CPG: 4/5/6.2.6, 4/5/6.7.5)
Indications	Acute severe pain in patients greater than and equal to 1 year old (≥ 1 year)
Contraindications	Known fentanyl hypersensitivity ALoC Bilateral occluded nasal passage Nasal trauma Epistaxis Hypovolaemia
Usual Dosages	**Adult:** 0.1 mg IN Repeat by one after 10 minutes if severe pain persists **Paediatric:** 0.0015 mg/Kg (1.5 mcg/Kg) IN Repeat by one after 10 minutes if severe pain persists
Pharmacology/Action	Fentanyl provides some of the effects typical of other opioids through its agonism of the opioid receptors. Its strong potency in relation to that of morphine is largely due to its high lipophilicity. Because of this, it can more easily penetrate the CNS. Fentanyl binds to μ-opioid G-protein-coupled receptors, which inhibit pain neurotransmitter release by decreasing intracellular Ca^{2+} levels.
Side effects	Sedation Nausea
Long-term side effects	Vomiting Respiratory depression
Additional information	**Caution if patient has transdermal Fentanyl patch** Include an additional 0.1 mL, to allow for dead space in the mucosal atomisation device (MAD), in the calculated volume required. Administer 50% volume in each nostril if more than 1 mL

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: AP

Medication	Furosemide Injection
Class	Diuretic
Description	A loop diuretic
Presentation	Ampoule 10 mg per mL 2 mL, 5 mL and 25 mL per ampoule
Administration	Intravenous (IV) (CPG: 5/6.3.5)
Indications	Pulmonary oedema
Contraindications	Pregnancy, hypokalaemia Known severe adverse reaction
Usual Dosages	**Adult:** 40 mg slow IV **Paediatric:** Not indicated
Pharmacology/Action	Acts on the ascending loop of Henle by inhibiting the reabsorption of chloride and sodium ions into the interstitial fluid. This results in a relative hypertonic state. Water is therefore retained in the loop and eliminated via the bladder. It also causes venodilation which reduces venous return to the heart.
Side effects	Headache, dizziness, hypotension, arrhythmias, transient deafness, diarrhoea, nausea & vomiting.
Long-term side effects	Hyperuricaemia, gout, hypokalaemia and hyperglycaemia.
Additional information	Furosemide should be protected from light

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: EMT P AP

Medication	Glucagon
Class	Hormone and Antihypoglycaemic
Description	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: 5/6.4.19, 4.4.19, 5/6.7.32, 4.7.32)
Indications	Hypoglycaemia in patients unable to take oral glucose or unable to gain IV access, with a blood glucose level < 4 mmol/L
Contraindications	Known severe adverse reaction Phaeochromocytoma
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 & vomiting.
Additional information	May be ineffective in patients with low stored glycogen e.g. prior use in previous 24 hours, alcoholic patients with liver disease. Store in refrigerator Protect from light

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: EFR EMT P AP

Medication	Glucose gel
Class	Antihypoglycaemic
Description	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: 5/6.4.19, 4.4.19, 2/3.4.19, 5/6.7.32, 4.7.32)
Indications	Hypoglycaemia Blood glucose < 4 mmol/L **EFR** – Known diabetic with confusion or altered levels of consciousness
Contraindications	Known severe adverse reaction
Usual Dosages	**Adult:** 10 – 20 g buccal Repeat prn **Paediatric:** ≤ 8 years; 5 – 10 g buccal > 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 five 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: EFR EMT P AP

Medication	Glyceryl Trinitrate (GTN)
Class	Nitrate
Description	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 0.4 mg (400 mcg)
Administration	Sublingual (SL): Hold the pump spray vertically with the valve head uppermost Place as close to the mouth as possible and spray under the tongue The mouth should be closed after each dose (CPG: 5/6.3.5, 4.4.10, 5/6.4.10)
Indications	Angina Suspected Myocardial Infarction (MI) EFRs may assist with administration Advanced Paramedic and Paramedic - Pulmonary oedema
Contraindications	SBP < 90 mmHg Viagra or other phosphodiesterase type 5 inhibitors (Sildenafil, Tadalafil and Vardenafil) used within previous 24 hours Known severe adverse reaction
Usual Dosages	**Adult:** **Angina or MI:** 0.4 mg (400 mcg) Sublingual Repeat at 3-5 min intervals, Max: 1.2 mg (**EFRs** 0.4 mg sublingual max assist patient) **Pulmonary oedema;** 0.8 mg (800 mcg) sublingual Repeat x 1 **Paediatric:** Not indicated
Pharmacology/Action	Vasodilator Releases nitric oxide which acts as a vasodilator. Dilates coronary arteries particularly if in spasm increasing blood flow to myocardium. Dilates systemic veins reducing venous return to the heart (pre load) and thus reduces the heart's workload. Reduces BP
Side effects	Headache Transient Hypotension Flushing Dizziness
Additional information	If the pump is new or has not been used for a week or more, the first spray should be released into the air.

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: P AP

Medication	Hartmann's Solution
Class	Isotonic crystalloid solution
Description	Hartmann's solution is an isotonic crystalloid solution containing Sodium chloride 0.6%, Sodium lactate 0.25%, Potassium chloride 0.04%, Calcium chloride 0.027%
Presentation	Soft pack for infusion 500 mL & 1000 mL
Administration	Intravenous (IV) infusion Intraosseous (IO) infusion **Paramedic:** maintain infusion once commenced
Indications	When NaCl is unavailable it may be substituted with Hartmann's Solution IV/IO, except for crush injuries, burns, renal failure and hyperglycaemia.
Contraindications	Known severe adverse reaction
Usual Dosages	**Adult:** See NaCl **Paediatric:** See NaCl
Pharmacology/Action	Increases extracellular volume
Side effects	If administered in large amounts may cause oedema
Additional information	Observe caution with patients with history of heart failure Also called: Sodium Lactate Intravenous Solution or Compound Ringer Lactate Solution for Injection Warm fluids prior to administration if possible

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: P AP

Medication	Hydrocortisone
Class	Corticosteroid and anti-inflammatory
Description	Hydrocortisone is a potent corticosteroid with anti-inflammatory properties
Presentation	Powder and solvent for solution for injection or infusion. Vial containing off-white powder and vial containing water for injections. Prepare the solution aseptically by adding not more than 2 mL of Sterile Water for Injections to the contents of one 100 mg vial, shake and withdraw for use.
Administration	Intravenous (IV) infusion Intramuscular (IM) The preferred route for initial emergency use is intravenous (CPG: 4/5/6.3.3, 4/5/6.3.4, 5/6.4.13, 5/6.4.15, 4/5/6.7.12, 5/6.7.30, 5/6.7.31)
Indications	Severe or recurrent anaphylactic reactions Asthma refractory to Salbutamol and Ipratropium Bromide Exacerbation of COPD (Advanced Paramedic) Adrenal insufficiency (Paramedic)
Contraindications	No major contraindications in acute management of anaphylaxis
Usual Dosages	**Adult:** **Anaphylactic reaction and Exacerbation of COPD (AP):** 200 mg IV (infusion in 100 mL NaCl) or IM **Asthma (AP)**: 100 mg IV (infusion in 100 mL NaCl) **Adrenal insufficiency (P & AP):** 100 mg IV (infusion in 100 mL NaCl) or IM **Paediatric:** **Anaphylactic reaction (AP);** < 1 year 25 mg IV (infusion in 100 mL NaCl) or IM 1 to 5 years 50 mg IV (infusion in 100 mL NaCl) or IM > 5 years 100 mg IV (infusion in 100 mL NaCl) or IM **Asthma (AP);** < 1 year 25 mg IV (infusion in 100 mL NaCl) 1 to 5 years 50 mg IV (infusion in 100 mL NaCl) > 5 years 100 mg IV (infusion in 100 mL NaCl) **Adrenal insufficiency (P & AP);** 6 mths to ≤ 5 years: 50 mg IV (AP) (infusion in 100 mL NaCl) or IM (P) > 5 years : 100 mg IV (AP) (infusion in 100 mL NaCl) or IM (P)
Pharmacology/Action	Potent anti-inflammatory properties and inhibits many substances that cause inflammation

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: P AP

Medication	Hydrocortisone *(contd.)*
Side effects	CCF, hypertension, abdominal distension, vertigo, headache, nausea, malaise and hiccups.
Long-term side effect	Adrenal cortical atrophy develops during prolonged therapy and may persist for months after stopping treatment
Additional information	Intramuscular injection should avoid the deltoid area because of the possibility of tissue atrophy Dosage should not be less than 25 mg IV is the preferred route for adrenal crisis

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: EMT P AP

Medication	Ibuprofen
Class	Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)
Description	It is an anti-inflammatory analgesic
Presentation	Suspension 100 mg in 5 mL 200 mg tablet, 400 mg tablet
Administration	Orally (PO) (CPG: 4/5/6.2.6, 4/5/6.7.5)
Indications	Mild to moderate pain
Contraindications	Not suitable for children under 3 months Patient with history of asthma exacerbated by aspirin Pregnancy Peptic ulcer disease Known severe adverse reaction
Usual Dosages	**Adult:** 400 mg PO **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	Occasionally gastrointestinal bleeding and ulceration occurs. May also cause acute renal failure, interstitial nephritis and 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 concurrent NSAIDs use

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: P AP

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

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: AP

Medication	Lidocaine
Class	Antiarrhythmic
Description	Ventricular antiarrhythmic agent
Presentation	Lidocaine Injection Mini jet 1% w/v 100 mg per 10 mL
Administration	Intravenous (IV) Intraosseous (IO) (CPG: 4/5/6.4.3)
Indications	When Amiodarone is unavailable it may be substituted with Lidocaine for VF/VT arrests
Contraindications	No contraindications for cardiac arrest
Usual Dosages	**Adult:** 1 – 1.5 mg/Kg IV / IO Max: 3 mg/Kg **Paediatric:** Not indicated
Pharmacology/Action	Reduces automaticity by decreasing the rate of diastolic depolarisation. Stabilises the neuronal membrane and prevents the initiation and transmission of nerve impulses, action is rapid and blockade may last up to 2 hours.
Side effects	Drowsiness, dizziness, twitching, paraesthesia, convulsions. Bradycardia Respiratory depression
Additional information	Lidocaine may not be administered if Amiodarone has been administered

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: AP

Medication	Lorazepam
Class	Benzodiazepine
Description	It is an anxiolytic used as a sedative
Presentation	1 mg tablet
Administration	Orally (PO) (CPG: 6.4.29)
Indications	Combative with hallucinations or paranoia & risk to self or others
Contraindications	History of sensitivity to benzodiazepines Severe hepatic or pulmonary insufficiency Suspected significant alcohol and/or sedatives ingested Known severe adverse reaction
Usual Dosages	**Adults:** 2 mg PO **Paediatric:** Not indicated
Pharmacology/Action	Acts on CNS receptors to potentiate the inhibitory action of GABA
Side effects	Drowsiness, confusion, headache, dizziness, blurred vision & nausea/vomiting. On rare occasions – hypotension, hypertension.

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: AP

Medication	Magnesium Sulphate injection
Class	Electrolyte and Tocolytic agent
Description	It is a salt that is an essential element in numerous biochemical reactions that occur within the body
Presentation	Ampoule 5 g in 10 mL
Administration	Intravenous (IV) Intraosseous (IO) (CPG: 4/5/6.3.4, 4/5/6.4.3, 5/6.4.12, 5/6.4.23)
Indications	Torsades de pointes Persistent bronchospasm Seizure associated with eclampsia
Contraindications	None in cardiac arrest Known severe adverse reaction
Usual Dosages	**Adults:** Pulseless torsades de points: 2 g IV/IO Torsades de pointes: 2 g IV (infusion in 100 mL NaCl) Persistent bronchospasm: 2 g IV (infusion in 100 mL NaCl) Seizure: associated with pre-eclampsia: 4 g IV (infusion in 100 mL NaCl) **Paediatric:** Not indicated
Pharmacology/Action	It acts as a physiological calcium channel blocker and blocks neuromuscular transmission
Side effects	Decreased deep tendon reflexes, respiratory depression, bradycardia and hypothermia.

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: P AP

Medication	Midazolam Solution
Class	Benzodiazepine
Description	It is a potent sedative agent. Clinical experience has shown Midazolam to be 3 to 4 times more potent per mg as Diazepam.
Presentation	Ampoule 10 mg in 2 mL or ampoule 10 mg in 5 mL. Buccal liquid 50 mg in 5 mL. Pre-filled syringe 2.5 mg in 0.5 mL. Pre-filled syringe 5 mg in 1 mL. Pre-filled syringe 7.5 mg in 1.5 mL. Pre-filled syringe 10 mg in 2 mL. Pre-filled syringe 10 mg in 1 mL.
Administration	Intravenous (IV). Intraosseous (IO). Intramuscular (IM). Buccal. Intranasal (IN) (50% in each nostril). (CPG: 5/6.4.23, 6.4.29, 5/6.7.33).
Indications	Seizures. Combative with hallucinations or paranoia and risk to self or others.
Contraindications	Shock. Depressed vital signs or alcohol-related altered level of consciousness. Respiratory depression. Known severe adverse reaction.
Usual Dosages	**Adults:** **Seizure or combative patient.** 2.5 mg IV/IO (AP) or 5 mg IM or 10mg buccal or 5 mg intranasal (P & AP) (Repeat x 1 prn) **Paramedic:** IM, buccal or IN only. **Paediatric:** **Seizure:** < 1year: 2.5 mg buccal 1 year to < 5 years: 5 mg buccal 5 years to < 10 years: 7.5 mg buccal ≥ 10 years: 10 mg buccal or 0.2 mg/Kg intranasal or 0.1 mg/Kg IV/IO (Repeat x 1 prn) **Paramedic:** buccal or IN only
Pharmacology/Action	It affects the activity of a chemical that transmits impulses across nerve synapses called Gamma-AminoButyric Acid (GABA). GABA is an inhibitory neurotransmitter. Midazolam works

APPENDIX 1
MEDICATION FORMULARY

Medication	Midazolam Solution *(contd)*
	by increasing the effects of GABA at these receptors.
Side effects	Respiratory depression, headache, hypotension & drowsiness
Additional information	Midazolam IV should be titrated to effect. Ensure oxygen and resuscitation equipment are available prior to administration. No more than two doses by practitioners. Practitioners should take into account the dose administered by carers prior to arrival of practitioner. Contraindications, other that KSAR, refer to non seizing patients.

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: AP

Medication	Morphine Sulphate
Class	Narcotic analgesic
Description	CNS depressant and a potent analgesic with haemodynamic properties that make it extremely useful in emergency medicine
Presentation	Ampoule 10 mg in 1 mL (dilute in 9 mL of NaCl) Suspension 10 mg in 5 mL
Administration	Intravenous (IV) Intraosseous (IO) Orally (PO) Intramuscular (IM) (CPG: 4/5/6.2.6, 4/5/6.7.5)
Indications	**Adult:** Severe pain (≥ 7 on pain scale) **Paediatric:** Severe pain (≥ 7 on pain scale)
Contraindications	PO < 1 year old Known severe adverse reaction Labour pains Acute respiratory depression Acute intoxication Systolic BP < 90 mmHg
Usual Dosages	**Adult:** 2 mg IV/IO Repeat at not < 2 minute intervals prn to Max 10 mg For musculoskeletal pain Max 16 mg Up to 10 mg IM (if no cardiac chest pain and no IV access) **Paediatric:** 0.3 mg/Kg (300 mcg/Kg) PO (Max 10 mg) 0.05 mg/Kg (50 mcg/Kg) IV/IO Repeat at not < 2 min prn to Max of 0.1 mg/Kg IV/IO
Pharmacology/Action	**Opiate Analgesic** Acts on Central Nervous System to reduce pain & anxiety Vasodilatation resulting in reduced pre-load to myocardium
Side effects	Respiratory depression Drowsiness Nausea & vomiting Constipation
Long-term side effects	Long-term use may lead to dependence

APPENDIX 1
MEDICATION FORMULARY

Medication	Morphine Sulphate *(contd)*
Additional information	Use with extreme caution particularly with elderly/young Caution with acute respiratory distress Caution with reduced GCS Not recommended for headache N.B. Controlled under Misuse of Drugs Act (1977, 1984)

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: EMT P AP

Medication	Naloxone
Class	Narcotic antagonist
Description	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	Intravenous (IV) Intramuscular (IM) Subcutaneous (SC) Intraosseous (IO) Intranasal (IN) (CPG: 6.4.22, 4/5.4.22, 5/6.5.2, 4/5/6.7.11)
Indications	Inadequate respiration and/or ALoC following known or suspected narcotic overdose
Contraindications	Known severe adverse reaction
Usual Dosages	**Adult:** 0.4 mg (400 mcg) IV/IO (AP) 0.4 mg (400 mcg) IM or SC (P) 0.8 mg (800 mcg) IN (EMT) Repeat after 3 min prn to a Max 2 mg **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 & 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: AP

Medication	Nifedipine
Class	Tocolytic agent and calcium channel blocker
Description	Dihydropyridine calcium channel blocker
Presentation	20 mg tablet
Administration	Orally (PO) (CPG: 5/6.5.5)
Indications	Prolapsed cord
Contraindications	Hypotension Known severe adverse reaction
Usual Dosages	**Adults:** 20 mg PO **Paediatric:** Not indicated
Pharmacology/Action	Inhibits muscle contraction by interfering with the movement of calcium ions through the slow channels of active cell membrane
Side effects	Hypotension Headache Bradycardia Nausea & vomiting
Additional information	Close monitoring of maternal pulse & BP is required and continuous foetal monitoring should be carried out if possible

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: EMT P AP

Medication	Nitrous Oxide 50% and Oxygen 50% (Entonox®)
Class	Analgesic
Description	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, 4.5.1, 5/6.5.6, 4/5/6.7.5)
Indications	Pain relief
Contraindications	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 relieved **Paediatric:** Self-administered until pain relieved
Pharmacology/Action	**Analgesic agent gas:** - CNS depressant - Pain relief
Side effects	Disinhibition Decreased level of consciousness Lightheadedness
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: AP

Medication	Ondansetron
Class	Antiemetic
Description	Used in management of nausea & vomiting Potent, highly selective 5 HT3 receptor-antagonist
Presentation	Ampoule 2 mL (4 mg in 2 mL)
Administration	Intravenous (IV) (CPG: 6.4.26, 4/5/6.2.6, 4/5/6.7.5)
Indications	Management, prevention and treatment of nausea & vomiting.
Contraindications	Known severe adverse reaction
Usual Dosages	**Adult:** 4 mg slow IV **Paediatric:** 0.1 mg/Kg IV slowly to a Max of 4 mg
Pharmacology/Action	Precise mode of action in the control of nausea & vomiting is not known
Side effects	Headache Sensation of warmth Flushing Hiccups

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: EFR EMT P AP

Medication	Oxygen
Class	Gas
Description	Odourless, tasteless, colourless gas necessary for life.
Presentation	D, E or F cylinders, coloured black with white shoulders CD cylinder; white cylinder Medical gas
Administration	Inhalation via: High concentration reservoir (non-rebreather) mask Simple face mask Venturi mask Tracheostomy mask Nasal cannulae 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
Contraindications	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% 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 minute duration. Caution with paraquat poisoning, administer oxygen if SpO_2 < 92%. Avoid naked flames, powerful oxidising agent.

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: EMT P AP

Medication	Paracetamol
Class	Analgesic and antipyretic
Description	Paracetamol is used to reduce pain and body temperature
Presentation	Rectal suppository 180 mg, 90 mg and 60 mg Suspension 120 mg in 5 mL or 250 mg in 5 mL 500 mg tablet
Administration	Per Rectum (PR) Orally (PO) (CPG: 4/5/6.2.6, 4/5/6.4.24, 4/5/6.7.5, 4/5/6.7.35)
Indications	Pyrexia Minor or moderate pain (1 - 6 on pain scale) for adult and paediatric patients
Contraindications	Known severe adverse reaction Chronic liver disease < 1 month old
Usual Dosages	**Adult:** 1 g PO **Paediatric:** **PR** (AP) > 1 mth < 1 year - 90 mg PR 1-3 years - 180 mg PR. 4-8 years - 360 mg PR **PO** (AP, P & EMT) 20 mg/Kg PO
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 prior to arrival on scene. For PR use be aware of modesty of patient, should be administered in presence of a 2nd person. If Paracetamol administered in 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: EFR EMT P AP

Medication	Salbutamol
Class	Sympathetic agonist
Description	Sympathomimetic that is selective for beta-2 adrenergic receptors
Presentation	Nebule 2.5 mg in 2.5 mL Nebule 5 mg in 2.5 mL Aerosol inhaler: metered dose 0.1 mg (100 mcg)
Administration	Nebuliser (NEB) Inhalation via aerosol inhaler (CPG: 4/5/6.3.3, 4/5/6.3.4, 3.3.4, 5/6.4.15, 4.4.15, 2/3.4.16, 4/5/6.6.10, 4/5/6.7.12, 3.7.12, 5/6.7.31, 4.7.31, 2/3.7.31)
Indications	Bronchospasm Exacerbation of COPD Respiratory distress following submersion incident
Contraindications	Known severe adverse reaction
Usual Dosages	**Adult:** 5 mg NEB (or 0.1 mg metered aerosol spray x 5) Repeat at 5 min prn (EFRs: 0.1 mg metered aerosol spray x 5, assist patient) **Paediatric:** < 5 yrs - 2.5 mg NEB (or 0.1 mg metered aerosol spray x 3) ≥ 5 yrs - 5 mg NEB (or 0.1 mg metered aerosol spray x 5) Repeat at 5 min prn (EFRs: 0.1 mg metered aerosol spray x 2, assist patient)
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 volumizer in conjunction with an aerosol inhaler when administering Salbutamol. If an oxygen driven nebuliser is used to administer Salbutamol for a patient with acute exacerbation of COPD it should be limited to 6 minutes maximum.

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: AP

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

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: P AP

Medication	Sodium Chloride 0.9% (NaCl)
Class	Isotonic crystalloid solution
Description	Solution of sodium and chloride, also known as normal saline (NaCl)
Presentation	Soft pack for infusion 100 mL, 500 mL & 1,000 mL Ampoules 10 mL
Administration	Intravenous (IV) infusion, Intravenous (IV) flush, Intraosseous (IO) **Paramedic:** maintain infusion once commenced (CPG: Sodium Chloride 0.9% is used extensively throughout the CPGs)
Indications	IV/IO fluid for pre-hospital emergency care
Contraindications	Known severe adverse reaction
Usual Dosages	**ADULT** Keep vein open (KVO) or medication flush for cardiac arrest prn **Crush injury, Suspension Trauma, PEA or Asystole:** 20 mL/Kg IV/IO infusion **Hypothermia:** 250 mL IV/IO infusion (warmed to 40°C approx) Repeat to max 1 L **# neck of femur, sepsis, symptomatic bradycardia:** 250 mL IV infusion **Decompression illness, sepsis with poor perfusion:** 500 mL IV/IO infusion **Shock from blood loss;** 500 mL IV/IO infusion. Repeat in aliquots of 250 mL prn to maintain systolic BP of; 90 – 100 mmHg 120 mmHg (head injury GCS ≤ 8) **Burns;** > 25% TBSA and/or 1 hour from time of injury to ED, 1000 mL IV/IO infusion > 10% TBSA consider 500 mL IV/IO infusion **Adrenal insufficiency, Glycaemic emergency, Heat-related Emergency, Sickle Cell Crisis;** 1,000 mL IV/IO infusion **Anaphylaxis;** 1,000 mL IV/IO infusion, repeat x one prn **Post-resuscitation care:** 1,000 mL IV/IO infusion (at 4°C approx). If persistent hypotension maintain Sys BP > 90 mmHg

APPENDIX 1
MEDICATION FORMULARY

Medication	Sodium Chloride 0.9% (NaCl) *(contd)*
Usual Dosages	**PAEDIATRIC** Keep vein open (KVO) or medication flush for cardiac arrest prn **Glycaemic emergency, Neonatal resuscitation, Sickle Cell Crisis:** 10 mL/Kg IV/IO infusion **Hypothermia:** 10 mL/Kg IV/IO infusion (warmed to 40°C approx). Repeat prn x 1 **Haemorrhagic shock;** 10 mL/Kg IV/IO, repeat prn if signs of inadequate perfusion **Anaphylaxis;** 20 mL/Kg IV/IO infusion, repeat x one prn **Adrenal insufficiency, Crush injury, Septic shock, Suspension Trauma, Symptomatic Bradycardia, Asystole/PEA:** 20 mL/Kg IV/IO infusion **Post-resuscitation care:** 20 mL/Kg IV/IO infusion if persistent poor perfusion **Burns:** > 10% TBSA and/or > 1 hour from time of injury to ED: 5 – 10 years: 250 mL IV/IO > 10 years: 500 mL IV/IO
Pharmacology/Action	Isotonic crystalloid solution Fluid replacement
Side effects	Excessive volume replacement may lead to heart failure
Additional information	NaCl is the IV/IO fluid of choice for pre-hospital emergency care For KVO use 500 mL pack only

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: AP

Medication	Syntometrine
Class	Synthetic hormone
Description	Ergometrine maleate 0.5 mg and synthetic oxytocin 5 units per mL
Presentation	Ampoule 1 mL
Administration	Intramuscular (IM) (CPG: 5/6.5.4)
Indications	Control of post-partum haemorrhage
Contraindications	Severe kidney, liver or cardiac dysfunction. Sepsis Known severe adverse reaction
Usual Dosages	**Adult:** 1 mL IM **Paediatric:** Not indicated
Pharmacology/Action	Causes rhythmic contraction of uterine smooth muscle, thereby constricting uterine blood vessels.
Side effects	Nausea & vomiting Abdominal pain Headache Dizziness Cardiac arrhythmias
Additional information	Ensure that a second foetus is not in the uterus prior to administration

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: MP

Medication	Tenecteplase Powder for injection
Class	Thrombolytic agent
Description	A recombinant fibrin-specific plasminogen activator
Presentation	Powder and solvent for solution 1 vial contains 10,000 units (50 mg) tenecteplase 1 pre-filled syringe contains 10 mL water for injections The reconstituted solution contains 1,000 units (5 mg) tenecteplase per mL
Administration	Intravenous (IV) (CPG: 5/6.4.10)
Indications	Patient conscious, coherent and understands therapy Patient consent obtained Confirmed STEMI Patient not suitable for PPCI from a time or clinical perspective
Contraindications	Haemorrhagic stroke or stroke of unknown origin at any time Ischaemic stroke in previous 6 months Central nervous system damage or neoplasms Recent major trauma/ surgery/ head injury (within 3 weeks) Gastro-intestinal bleeding within the last month Active peptic ulcer Known bleeding disorder Oral anticoagulant therapy Aortic dissection Transient ischaemic attack in preceding 6 months Pregnancy and within one week post-partum Non-compressible punctures Traumatic resuscitation Refractory hypertension (Sys BP > 180 mmHg) Advanced liver disease Infective endocarditis
Usual Dosages	**Adult:** **Kg** / **Units** / **mg** / **mL** < 60 / 6,000 / 30 / 6 ≥ 60 < 70 / 7,000 / 35 / 7 ≥ 70 < 80 / 8,000 / 40 / 8 ≥ 80 < 90 / 9,000 / 45 / 9 ≥ 90 / 10,000 / 50 / 10 **Paediatric:** Not indicated
Pharmacology/Action	Tenecteplase is a recombinant fibrin-specific plasminogen activator that is derived from native t-PA by modifications at three sites of the protein structure. It binds to the fibrin

APPENDIX 1
MEDICATION FORMULARY

Medication	Tenecteplase Powder for injection *(Contd)*
	component of the thrombus (blood clot) and selectively converts thrombus-bound plasminogen to plasmin, which degrades the fibrin matrix of the thrombus.
Side effects	Haemorrhage predominantly superficial at the injection site Ecchymoses are observed commonly but usually do not require any specific action Stroke (including intracranial bleeding) and other serious bleeding episodes
Additional information	Enoxaparin should be used as antithrombotic adjunctive therapy

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: P AP

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

APPENDIX 1
MEDICATION FORMULARY

CLINICAL LEVEL: AP

Medication	Tranexamic Acid
Class	Anti-fibrinolytic
Description	An anti-fibrinolytic which reduces the breakdown of blood clots
Presentation	Ampoule 500 mg in 5 mL
Administration	Intravenous (IV) (CPG: 5/6.6.8).
Indications	Suspected significant internal or external haemorrhage associated with trauma
Contraindications	Hypersensitivity to the active substance or to any of the excipients Acute venous or arterial thrombosis History of convulsions Severe hepatic impairment
Usual Dosages	**Adult:** 1 g IV/IO (infusion in 100 mL NaCl) **Paediatric:** Not indicated
Pharmacology/Action	Tranexamic acid exerts an anti-haemorrhagic activity by inhibiting the activation of plasminogen to plasmin, by binding to specific sites of both plasaminogen and plasmin, a molecule responsible for the degredation of fibrin, a protein that forms the framework of blood clots.
Side effects	Common: Diarrhoea, vomiting, nausea. Other undesirable effects include visual disturbance, impaired coloured vision, dizziness and headache.
Additional information	Caution with head injury