APPENDIX 1 - Medication Formulary

The Medication Formulary is published by the Pre-Hospital Emergency Care Council (PHECC) to support Emergency First Responders to be competent in the use of medications permitted under Clinical Practice Guidelines (CPGs).

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

The medications herein may be administered or patients may be assisted to administer the medications herein provided:

1. The Emergency First Responder complies with the CPGs published by PHECC.
2. The Emergency First Responder is acting on behalf of an organisation (paid or voluntary) that is a PHECC licensed CPG provider.
3. The Emergency First Responder is privileged, by the organisation on whose behalf he/she is acting, to administer the medications.
4. The Emergency First Responder has received training on, and is competent in, the administration of the medication.

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 Emergency First Responder administration of medications. The principle of titrating the dose to the desired effect shall be applied. The onus rests on the Emergency First Responder to ensure that he/she is using the latest versions of CPGs which are available on the PHECC website www.phecc.ie

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 as specified by the CPG.

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

Paediatric weight estimations acceptable to PHECC are:

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

Pregnancy caution:

Medications should be administered 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.

Responders therefore should avoid using medications in early pregnancy unless absolutely essential, and where possible, medical oversight should be sought prior to administration.

This edition contains 6 medications for Emergency First Responder.

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

Amendments to the EFR-BTEC 2014 Edition:

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	

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	**EFR:** assist patient - Asthma/Anaphylaxis = 0.1 mg metered aerosol spray (repeat x 11 prn) **Paediatric:** **EFR:** assist patient - Asthma/Anaphylaxis < 5 yrs - 0.1 mg metered aerosol spray (repeat x 5 prn) > 5 yrs - 0.1 mg metered aerosol spray (repeat x 11 prn)	5 mg NEB or (0.1 mg metered aerosol spray x 5) **EFRs:** (0.1 mg metered aerosol spray x 2) **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)

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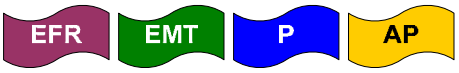
Clinical level: 

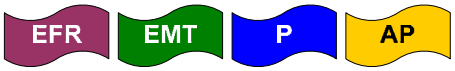
Medication	Aspirin
Class	Platelet aggregation inhibitor.
Descriptions	Anti-inflammatory agent and an inhibitor of platelet function. Useful agent in the treatment of various thromboembolic diseases such as acute myocardial infarction.
Presentation	300 mg dispersible tablet.
Administration	Orally (PO) - 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. Management of unstable angina and non ST-segment elevation myocardial infarction (NSTEMI). Management of ST-segment elevation myocardial infarction (STEMI).
Contra-Indications	Active symptomatic gastrointestinal (GI) ulcer / Bleeding disorder (e.g. haemophilia) / Known severe adverse reaction / Patients < 16 years old (risk of Reye's syndrome).
Usual Dosages	***Adult:*** 300 mg tablet. ***Paediatric:*** Contraindicated.
Pharmacology / Action	***Antithrombotic:*** Inhibits the formation of thromboxane A2, which stimulates platelet aggregation and artery constriction. This reduces clot/thrombus formation in an MI.
Side effects	Epigastric pain and discomfort / Bronchospasm / Gastrointestinal haemorrhage / Increased bleeding time / Skin reactions in hypersensitive patients.
Long term effects	Generally mild and infrequent but incidence of gastro-intestinal irritation with slight asymptomatic blood loss, increased bleeding time, bronchospasm and skin reaction in hypersensitive patients.
Additional information	Aspirin 300 mg is indicated for cardiac chest pain regardless if patient is on anti-coagulants or is already on Aspirin. If the patient has swallowed an Aspirin (enteric coated) preparation without chewing it, the patient should be regarded as not having taken any Aspirin; administer 300 mg PO.

Clinical level: 

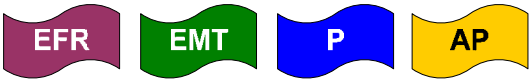
Medication	Epinephrine (1:1,000)
Class	Sympathetic agonist.
Descriptions	Naturally occurring catecholamine. It is a potent alpha and beta adrenergic stimulant; however, its effect on beta receptors is more profound.
Presentation	Pre-filled syringe, ampoule or Auto injector. 1 mg/1 mL (1:1,000).
Administration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

Clinical level: 

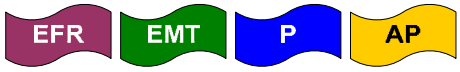
Medication	Glucose gel
Class	Antihypoglycaemic.
Descriptions	Synthetic glucose paste.
Presentation	Glucose gel in a tube or sachet.
Administration	Buccal administration: Administer gel to the inside of the patient's cheek and gently massage the outside of the cheek. (***CPG:*** 2/3.4.19, 4/5/6.4.19,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

Clinical level: 

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

Clinical Level: 

Medication	Oxygen
Class	Gas.
Descriptions	Odourless / Tasteless / Colourless gas necessary for life.
Presentation	***Medical gas:*** D, E or F cylinders, coloured black with white shoulders. ***CD cylinder:*** White cylinder.
Administration	***Inhalation via:*** High concentration reservoir (non-rebreather) mask / Simple face mask / Venturi mask / Tracheostomy mask / Nasal cannulae / CPAP device / Bag Valve Mask. **(*CPG:* Oxygen is used extensively throughout the CPGs).**
Indications	Absent / Inadequate ventilation following an acute medical or traumatic event. SpO_2 < 94% adults and < 96% paediatrics. SpO_2 < 92% for patients with acute exacerbation of COPD. SpO_2 < 90% for patients with acute onset of Pulmonary Oedema.
Contra-Indications	Bleomycin lung injury.
Usual Dosages	***Adult:*** Cardiac and respiratory arrest or sickle cell crisis; 100%. Life threats identified during primary survey; 100% until a reliable SpO_2 measurement obtained then titrate O_2 to achieve SpO_2 of 94% - 98%. For patients with acute exacerbation of COPD, administer O_2 titrate to achieve SpO_2 92% or as specified on COPD Oxygen Alert Card. All other acute medical and trauma titrate O_2 to achieve SpO_2 94% - 98%. ***Paediatric:*** Cardiac and respiratory arrest or sickle cell crisis; 100%. Life threats identified during primary survey; 100% until a reliable SpO_2 measurement obtained then titrate O_2 to achieve SpO_2 of 96% - 98%. Neonatal resuscitation (< 4 weeks) consider supplemental O_2 (≤ 30%). All other acute medical and trauma titrate O_2 to achieve SpO_2 of 96% - 98%.
Pharmacology / Action	Oxygenation of tissue/organs.
Side effects	Prolonged use of O_2 with chronic COPD patients may lead to reduction in ventilation stimulus.
Additional information	A written record must be made of what oxygen therapy is given to every patient. Documentation recording oximetry measurements should state whether the patient is breathing air or a specified dose of supplemental Oxygen. Consider humidifier if oxygen therapy for paediatric patients is > 30 minutes duration. Caution with paraquat poisoning, administer Oxygen if SpO_2 < 92%. Avoid naked flames, powerful oxidising agent.

Clinical Level: 

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