Medication Formulary for Emergency First Responders

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.

Approved Paediatric weight estimations 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 medication for Emergency First Responder.

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

Changes to Monographs

1. Class and Description headings have merged to one Classification heading in line with BNF drug descriptors
2. Long term side effects have been removed unless essential
3. Pharmacology/Action has been removed unless essential information

EPINEPHRINE (1:1,000) CHANGES TO ADRENALINE (1:1000)			
Heading	Add		Delete
Medication	Adrenaline 1:1000.		Epinephrine 1:1000.
Indications	Stridor, Symptomatic Bradycardia and Cardiogenic Shock.		
Contra-indications	Hypersensitivity to excipients.		
Usual Dosages	< 6 months 6 months to < 6 years ≥ 6 years to < 12 years ≥ 12 years	10 mcg/kg IM 150 mcg (0.15 mL IM) 300 mcg (0.3 mL IM) 300 mcg (if child small or prepubital) or 500 mcg (0.3 mL or 0.5 mL IM)	All dosing which was previously recommended under the following age categories < 6 months, 6 months to 5 years, 6 to 8 years, > 8 years.

ASPIRIN		
Heading	Add	Delete
Classification	**Merge Class and Description to Classification:** Antithrombotic – Antiplatelet Drug which reduces clot formation.	Class. Description.
Description		Anti-inflammatory agent and an inhibitor of platelet function. Useful agent in the treatment of various thromboembolic diseases such as acute myocardial infarction.
Pharmacology/ Action		*Antithrombotic:* Inhibits the formation of thromboxane A2, which stimulates platelet aggregation and artery constriction. This reduces clot/ thrombus formation in an MI.
Long term side-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.

GLUCOSE GEL		
Heading	Add	Delete
Classification	Class and Description merged.	Class. Description.
Administration	CPG 4/5/6.12.7: New-born Neonatal Care and Resuscitation.	

APPENDIX 1 - Medication Formulary

GLYCERYL TRINITRATE (GTN)		
Heading	Add	Delete
Classification		Class. Description.
Presentation		(0.4 mg).
Usual Dosages	Angina or MI: 400 mcg sublingual. (Repeat at 3-5 min intervals, Max: 1200 mcg). EFR: assist administration - 400 mcg sublingual max. Pulmonary oedema: 800 mcg / 2 sprays (repeat x 1 PRN) (P & AP).	0.4 mg. 1.2 mg. 0.4 mg. 0.8 mg.
Pharmacology / Action		Remove complete section.

OXYGEN		
Heading	Add	Delete
Clinical Level		
Classification	Merged Class and Description.	Class. Description.
Pharmacology/Action		Pharmacology/Action Oxygenation of tissue/organs.
Additional Information	Caution with emollients containing paraffin e.g. lip balms & moisturisers – may lead to skin burns.	

APPENDIX 1 - Medication Formulary

SALBUTAMOL		
Heading	Add	Delete
Classification	Beta-2 Adrenoceptor agonist selective – short acting.	Class: Sympathetic agonist. Description: Sympathomimetic that is selective for Beta-2 Adrenergic receptors.
Presentation	100 mcg.	0.1 mg.
Usual Dosages	100 mcg metered aerosol spray.	0.1 mg metered aerosol spray.
Pharmacology / Action		Remove text/section Beta-2 agonist/ Bronchodilation/ relaxation of smooth muscle.

Clinical Level: EFR EMT P AP

MEDICATION	ADRENALINE (1:1000)
Classification	Sympathetic agonist, Sympathomimetic – Vasoconstrictor. Acts on both alpha & beta receptors and increases both heart rate and contractility. It can cause peripheral vasodilation (beta) or vasoconstriction (alpha).
Presentation	Pre-filled syringe, ampoule or Auto injector. 1 mg/1 mL (1:1,000).
Administration	Intramuscular (IM), Intravenous (IV) and Nebulisation (Neb). (*CPG:* 2/3.10.1 2/3.13.21, 4/5/6.3.2, 4/5/6.10.1, 4/5/6.11.1, 4/5/6.13.9, 5/6.13.20. 4/5/6.13.21, 5/6.14.6)
Indications	Severe allergic reaction/ anaphylaxis, Stridor, Symptomatic Bradycardia and Cardiogenic shock.
Contra-Indications	Hypersensitivity to excipients.
Usual Dosages	*Adult: Anaphylaxis* 500mcg IM (0.5mL of 1: 1,000). *EFR* assist patient – 0.3 mg (Auto injector). (Repeat every 5 minutes PRN). *Adult: Symptomatic Bradycardia / Cardiogenic shock (AP):* 10mcg IV/IO repeat PRN. (Dilute 1 mg Adrenaline in 100 mL NaCl and draw up in 1 mL syringe, administer the dose over 1 minute). (Off-license). *Anaphylaxis Paediatric:* < 6 months — 10 mcg/kg IM 6 months to < 6 years — 150 mcg (0.15 mL IM) ≥ 6 years to < 12 years — 300 mcg (0.3 mL IM) ≥ 12 years — 300 mcg (0.3 mL) (if child small or prepubital) or 500 mcg (0.5 mL IM) *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). *Sepsis (AP):* Adrenaline 0.1 mcg/kg IV/IO.
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: CFR FAR EFR EMT P AP

MEDICATION	ASPIRIN
Classification	Antithrombotic – Antiplatelet Drug which reduces clot formation.
Presentation	300 mg dispersible tablet. 300 mg Enteric Coated (EC) tablet.
Administration	Orally (PO) - dispersed in water, or to be chewed if not dispersible form. (*CPG:* 5/6.3.1, 4.3.1, 1/2/3.3.1).
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.
Side effects	Epigastric pain and discomfort/ Bronchospasm/ Gastrointestinal haemorrhage/ Increased bleeding times/ skin reactions in hypersensitive patients.
Additional information	Aspirin 300 mg is indicated for cardiac chest pain, regardless if patient is on an anti-coagulant or is already on Aspirin. If the patient has swallowed Aspirin EC (enteric coated) preparation without chewing, the patient should be regarded as not having taken any Aspirin; administer 300 mg PO.

Clinical Level: EFR EMT P AP

MEDICATION	GLUCOSE GEL
Classification	Nutrients. Sugars: Antihypoglycaemic.
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*: 4/5/6.5.3, 4/5/6.12.7 4/5/6.13.11).
Indications	Hypoglycaemia. Blood glucose < 4 mmol/L.
Contra-Indications	Known severe adverse reaction.
Usual Dosages	*Adult:* 10 – 20 g buccal (Recheck blood glucose and repeat after 15 min if required). *Paediatric:* New-born neonate: 2 - 4 mL if blood glucose ≤ 2.6 mmol/L. ≤ 8 years: 5 – 10 g buccal (recheck blood glucose and repeat after 15 mins if required). > 8 years: 10 – 20 g buccal (recheck blood glucose and repeat after 15 mins if required).
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: EFR EMT P AP

MEDICATION	GLYCERYL TRINITRATE (GTN)
Classification	Nitrate. Potent coronary vasodilator/ reduces BP/ Dilation of systemic veins.
Presentation	*Aerosol spray:* Metered dose of 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 immediately after each dose. (*CPG*: 4/5/6.2.6, 4/5/6.3.1, 1/2/3.3.1).
Indications	Angina/ suspected myocardial infarction (MI). *EFR:* may assist with administration. *EMT:* Angina/ suspected myocardial infarction (MI) with systolic BP ≥110 mmHg. *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:* 400 mcg sublingual. (Repeat at 3-5 min intervals, Max: 1200 mcg). *EFR:* assist administration - 400 mcg sublingual max. *Pulmonary oedema:* 800 mcg/ 2 sprays (repeat x 1 PRN) (P & AP). *Paediatric:* Not indicated.
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: CFR-A FAR EFR EMT P AP

MEDICATION	OXYGEN
Classification	Gas.
Presentation	*Medical gas:* D, E or F cylinders, coloured black with white shoulders. (Please note: By 2025, all cylinders will be completely white with OXYGEN in black). *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 O2 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%.
Side effects	Prolonged use of O_2 with chronic COPD patients may lead to reduction in ventilation stimulus.
Additional information	Caution with emollients containing paraffin e.g. lip balms & moisurisers – may lead to skin burns. 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: EFR EMT P AP

MEDICATION	SALBUTAMOL
Classification	Beta-2 Adrenoceptor agonist selective – short acting.
Presentation	Nebule 2.5 mg in 2.5 mL. Nebule 5 mg in 2.5 mL. Aerosol inhaler: Metered dose 100mcg per actuation (Puff).
Administration	Nebule Inhalation via aerosol inhaler. (*CPG*: 4/5/6.2.4, 2/3.2.5, 4/5/6.2.5, 4/5/6.8.9, 2/3.10.1, 4/5/6.10.1, 2/3.13.8, 4/5/6.13.8, 2/3.13.21, 4/5/6.13.21, 6.17.7).
Indications	Bronchospasm/ Exacerbation of COPD/ Respiratory distress following submersion incident.
Contra-Indications	Known severe adverse reaction.
Usual Dosages	*Adult:* 5 mg NEB or 100 mcg metered aerosol spray (repeat aerosol x 11). Repeat NEB at 5 minute intervals PRN EFR assist patient with Asthma/ Anaphylaxis. - 100mcg metered aerosol spray (repeat aerosol x 11 PRN). *Paediatric:* < 5 yrs - 2.5 mg NEB or 100 mcg metered aerosol spray (repeat aerosol x 5). > 5 yrs - 5 mg NEB or 100 mcg metered aerosol spray (repeat aerosol x 11). (Repeat NEB at 5 minute intervals PRN). EFR: assist patient with Asthma/ Anaphylaxis – < 5 yrs - 100 mcg /1 actuation metered aerosol spray (repeat aerosol x 5 PRN). > 5 yrs - 100mcg / 1 actuation metered aerosol spray (repeat aerosol x 11 PRN).
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.