The Medication Formulary is published by the Pre-Hospital Emergency Care Council (PHECC) to enable pre-hospital emergency care practitioners to be competent in the use of medications permitted under SI 512 of 2008 schedule 7.

The Medication Formulary is recommended by the Medical Advisory Group (MAG) and ratified by the Clinical Care Committee (CCC) prior to publication by Council.

The medications herein may be administered provided:

1 The Practitioner is in good standing on the PHECC Practitioner's Register.
2 The Practitioner complies with the Clinical Practice Guidelines (CPGs) published by PHECC.
3 The Practitioner is acting on behalf of an organisation (paid or voluntary) that is approved by PHECC to implement the CPGs.
4 The Practitioner is authorised, by the organisation on whose behalf he/she is acting, to administer the medications.
5 The Practitioner has received training on – and is competent in – the administration of the medication.
6 The medications are listed on the Medicinal Products Schedule 7.

The context for administration of the medications listed here is outlined in the CPGs.

Every effort has been made to ensure accuracy of the medication doses herein. The dose specified on the relevant CPG shall be the definitive dose in relation to Practitioner administration of medications. The principle of titrating the dose to the desired effect shall be applied. The onus rests on the Practitioner to ensure that he/she is using the latest version of CPGs which are available on the PHECC website www.phecc.ie

All medication doses for patients ≤ 13 years shall be calculated on a weight basis unless an age-related dose is specified for that medication.

THE DOSE FOR PAEDIATRIC PATIENTS MAY NEVER EXCEED THE ADULT DOSE.

Paediatric weight calculations acceptable to PHECC are:

- (age x 2) + 8 Kg
- Length based resuscitation tape (Broselow® or approved equivalent)

Reviewed on behalf of PHECC by Prof Peter Weedle, Professor of Clinical Pharmacy, School of Pharmacy, University College Cork.

This edition contains 9 medications for EMT level.
Please visit www.phecc.ie for the latest edition/version.

CLINICAL LEVEL: 


| DRUG NAME | **ASPIRIN** |
|---|---|
| Class | Platelet aggregator 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 soluble tablet. |
| Administration | Orally (PO) – dispersed in water, if soluble; to be chewed, if not soluble.<br>(CPG: 5/6.4.16, 4.4.16, 1/2/3.4.16). |
| Indications | Cardiac chest pain or suspected Myocardial Infarction. |
| Contra-Indications | Active symptomatic gastrointestinal (GI) ulcer.<br>Bleeding disorder (e.g. haemophilia).<br>Known severe adverse reaction.<br>Patients < 16 years old. |
| Usual Dosages | **Adult:** 300 mg tablet.<br>**Paediatric:** Not indicated. |
| Pharmacology/ Action | Antithrombotic.<br>Inhibits the formation of thromboxane $A_2$, which stimulates platelet aggregation and artery constriction. This reduces clot/ thrombus formation in an MI. |
| Side effects | Epigastric pain and discomfort.<br>Bronchospasm.<br>Gastrointestinal haemorrhage. |
| Long-term side effects | Generally mild and infrequent but high 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 has taken anti-coagulants or is already on Aspirin.<br>One 300 mg tablet in 24 hours. |

CLINICAL LEVEL: EMT P AP

| DRUG NAME | EPINEPHRINE (1:1 000) |
|---|---|
| Class | Sympathetic agonist. |
| Descriptions | Naturally occurring catecholamine. It is a potent alpha and beta adrenergic stimulant; however, its effect on beta receptors is more profound. |
| Presentation | Pre-filled syringe, ampoule or auto injector (for EMT use) 1 mg/1 mL (1:1 000). |
| Administration | Intramuscular (IM).<br>(CPG: 5/6.4.18, 5/6.7.8, 4.4.18, 4.7.8). |
| Indications | Severe anaphylaxis. |
| Contra-Indications | None known. |
| Usual Dosages | **Adult:** 0.5 mg (500 mcg) IM (0.5 mL of 1: 1 000).<br>EMT: use auto injector (0.3 mg).<br>Repeat every 5 minutes if indicated.<br>**Paediatric:** < 6 months: 0.05 mg (50 mcg) IM (0.05 mL of 1:1 000).<br>6 months to 5 years: 0.125 mg (125 mcg) IM (0.13 mL of 1:1 000).<br>6 to 8 years: 0.25 mg (250 mcg) IM (0.25 mL of 1:1 000).<br>>8 years: 0.5 mg (500 mcg) IM (0.5 mL of 1:1 000).<br>EMT: for 6 months <10 years use EpiPen® Jr (0.15 mg).<br>for ≥ 10 years use auto injector (0.3 mg).<br>Repeat every 5 minutes if indicated. |
| Pharmacology/ Action | Alpha and beta adrenergic stimulant.<br>Reversal of laryngeal oedema & bronchospasm in anaphylaxis.<br>Antagonises the effects of histamine. |
| Side effects | Palpitations.<br>Tachyarrthymias.<br>Hypertension.<br>Angina like symptoms. |
| Additional information | N.B. Double check the concentration on pack before use. |

CLINICAL LEVEL: EMT P AP

| DRUG NAME | GLUCAGON |
|---|---|
| Class | Hormone and antihypoglycaemic. |
| Descriptions | Glucagon is a protein secreted by the alpha cells of the islets of Langerhans in the pancreas. It is used to increase the blood glucose level in cases of hypoglycaemia in which an IV cannot be immediately placed. |
| Presentation | 1 mg vial powder and solution for reconstitution (1 mL). |
| Administration | Intramuscular (IM).<br>(CPG: 5/6.4.19, 5/6.7.9, 4.4.19, 4.7.9). |
| Indications | Hypoglycaemia in patients unable to take oral glucose or unable to gain IV access with a BG < 4 mmol/L. |
| Contra-Indications | Known severe adverse reaction.<br>Phaechromocytoma. |
| Usual Dosages | **Adult:** 1 mg IM.<br>**Paediatric:** ≤ 8 years 0.5 mg (500 mcg) IM.<br>>8 years 1 mg IM. |
| Pharmacology/Action | Glycogenolysis.<br>Increases plasma glucose by mobilising glycogen stored in the liver. |
| Side effects | Rare, may cause hypotension, dizziness, headache, nausea and vomiting. |
| Additional information | May be ineffective in patients with low stored glycogen e.g. prior use in previous 24 hours, alcoholic patients with liver disease.<br>Protect from light. |

CLINICAL LEVEL: EFR EMT P AP

| DRUG NAME | GLUCOSE GEL |
|---|---|
| Class | Antihypoglycaemic. |
| Descriptions | Synthetic glucose paste. |
| Presentation | Glucose gel in a tube or sachet. |
| Administration | Buccal administration:<br>Administer gel to the inside of the patient's cheek and gently massage the outside of the cheek.<br>(CPG: 5/6.4.19, 5/6.7.9, 4.4.19, 4.7.9, 2/3.4.19). |
| Indications | Hypoglycaemia.<br>BG < 4 mmol/L.<br>EFR: Known diabetic with confusion or altered levels of consciousness. |
| Contra-Indications | Known severe adverse reaction. |
| Usual Dosages | **Adult:** 10 – 20 g buccal.<br>Repeat prn.<br>**Paediatric:** ≤ 8 years; 5 – 10 g buccal,<br>>8 years; 10 – 20 g buccal.<br>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 or Glucagon to reverse hypoglycaemia.<br>Proceed with caution:<br>- patients with airway compromise.<br>- altered level of consciousness. |

CLINICAL LEVEL: EFR EMT P AP

| DRUG NAME | 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 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: 5/6.3.2, 5/6.4.16, 4.4.16, 1/2/3.4.16). |
| Indications | Angina.<br>Suspected Myocardial Infarction (MI).<br>EFR: may assist with administration.<br>Advanced Paramedic and Paramedic: Pulmonary oedema. |
| Contra-Indications | SBP < 90 mmHg.<br>Viagra or other phosphodiesterase type 5 inhibitors (Sildenafil, Tadalafil and Vardenafil) used within previous 24 hr.<br>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.<br>EFR: 0.4 mg sublingual max.<br>Pulmonary oedema; 0.8 mg (800 mcg) sublingual. Repeat x 1.<br>**Paediatric:** Not indicated. |
| Pharmacology/ Action | Vasodilator.<br>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 workload.<br>Reduces BP. |
| Side effects | Headache, Transient Hypotension, Flushing, Dizziness. |
| Additional information | 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: EMT P AP

| DRUG NAME | NITROUS OXIDE 50% AND OXYGEN 50% (ENTONOX®) |
|---|---|
| Class | Analgesic. |
| Descriptions | Potent analgesic gas contains a mixture of both nitrous oxide and oxygen. |
| Presentation | Cylinder, coloured blue with white and blue triangles on cylinder shoulders.<br>Medical gas: 50% Nitrous Oxide & 50% Oxygen. |
| Administration | Self administered.<br>Inhalation by demand valve with face-mask or mouthpiece.<br>(CPG: 4/5/6.2.6, 4/5/6.7.14, 5/6.5.1, 5/6.56, 4.5.1). |
| Indications | Pain relief. |
| Contra-Indications | Altered level of consciousness.<br>Chest Injury/pneumothorax.<br>Shock.<br>Recent scuba dive.<br>Decompression sickness.<br>Intestinal obstruction.<br>Inhalation Injury.<br>Carbon monoxide (CO) poisoning.<br>Known severe adverse reaction. |
| Usual Dosages | **Adult:** Self-administered until pain relieved.<br>**Paediatric:** Self-administered until pain relieved. |
| Pharmacology/ Action | Analgesic agent gas:<br>- CNS depressant.<br>- pain relief. |
| Side effects | Disinhibition.<br>Decreased level of consciousness.<br>Light headedness. |
| Additional information | Do not use if patient unable to understand instructions.<br>In cold temperatures warm cylinder and invert to ensure mix of gases.<br>Advanced Paramedics may use discretion with minor chest injuries.<br>Brand name: Entonox®.<br>Has an addictive property. |

CLINICAL LEVEL: EFR EMT P AP

| DRUG NAME | **OXYGEN** |
|---|---|
| Class | Gas. |
| Descriptions | Odourless, tasteless, colourless gas necessary for life. |
| Presentation | D, E or F cylinders, coloured black with white shoulders.<br>CD cylinder; white cylinder.<br>Medical gas. |
| Administration | Inhalation via: high concentration reservoir (non-rebreather) mask, simple face mask, venturi mask, tracheostomy mask, nasal cannulae, Bag Valve Mask.<br>(CPG: Oxygen is used extensively throughout the CPGs) |
| Indications | Absent/inadequate ventilation following an acute medical or traumatic event.<br>$SpO_2$ < 97%.<br>$SpO_2$ < 92% for patients with acute exacerbation of COPD. |
| Contra-Indications | Paraquat poisoning & Bleomycin lung injury. |
| Usual Dosages | **Adult:** Cardiac and respiratory arrest; 100% via BVM.<br>Pneumothorax; 100% via high concentration reservoir mask.<br>For patients with acute exacerbation of COPD, administer $O_2$ titrated to $SpO_2$ 92% or as specified on COPD Oxygen Alert Card.<br>All other acute medical and trauma titrate to $SpO_2$ > 97%.<br>**Paediatric:** Cardiac and respiratory arrest; 100% via BVM.<br>All other acute medical and trauma titrate to $SpO_2$ > 97%. |
| 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.<br>Documentation recording oximetry measurements should state whether the patient is breathing air or a specified dose of supplemental oxygen.<br>Consider humidifier if oxygen therapy for paediatric patients is >30 minute duration.<br>Avoid naked flames, powerful oxidising agent. |

CLINICAL LEVEL: EMT P AP

| DRUG NAME | PARACETAMOL |
|---|---|
| Class | Analgesic and antipyretic. |
| Descriptions | Paracetamol is used to reduce pain and body temperature. |
| Presentation | Rectal suppository 180 mg and 60 mg.<br>Suspension 120 mg in 5 mL.<br>500 mg tablet. |
| Administration | Per Rectum (PR).<br>Orally (PO).<br>(CPG: 4/5/6.2.6, 5/6.7.10, 4/5/6.7.14, 4.7.10). |
| Indications | Pyrexia following seizure for paediatric patients.<br>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.<br>Moderate pain (2 - 6 on pain scale) for adult and paediatric patients. |
| Contra-Indications | Paracetamol given in previous 4 hours.<br>Known severe adverse reaction. |
| Usual Dosages | **Adult:** 1 g PO<br>**Paediatric:** PR PO<br>< 1 year - 60 mg PR 20 mg/Kg PO<br>1-3 years - 180 mg PR<br>4-8 years - 360 mg PR |
| Pharmacology/ Action | Analgesic – central prostaglandin inhibitor.<br>Antipyretic – prevents the hypothalamus from synthesising. prostaglandin E, inhibiting the 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.<br>Consult with parent/guardian in relation to medication prior to arrival on scene.<br>For PR use be aware of modesty of patient. Should be administered in presence of a 2nd person. |

CLINICAL LEVEL: EFR EMT P AP

| DRUG NAME | SALBUTAMOL |
|---|---|
| Class | Sympathetic agonist. |
| Descriptions | Sympathomimetic that is selective for beta-two adrenergic receptors. |
| Presentation | Nebule 2.5 mg in 2.5 mL.<br>Nebule 5 mg in 2.5 mL.<br>Aerosol inhaler: metered dose 0.1 mg (100 mcg). |
| Administration | Nebuliser (NEB).<br>Inhalation via aerosol inhaler.<br>Advanced Paramedics may repeat Salbutamol x 3.<br>(CPG: 5/6.3.2, 5/6.3.3, 5/6.4.18, 4/5/6.6.7, 5/6.7.5, 5/6.7.8, 4.3.2, 4.4.18, 4.7.5, 4.7.8, 3.3.2, 3.7.5). |
| Indications | Bronchospasm.<br>Exacerbation of COPD.<br>Respiratory distress following submersion incident. |
| Contra-Indications | Known severe adverse reaction. |
| Usual Dosages | **Adult:** 5 mg NEB.<br>Repeat at 5 min prn (APs x 3 and Ps x 1).<br>EMT & EFR: 0.1 mg metered aerosol spray x 2.<br>**Paediatric:** < 5 yrs - 2.5 mg NEB.<br>≥ 5 yrs - 5 mg NEB.<br>Repeat at 5 min prn (APs x 3 and Ps x 1).<br>EMT & EFR: 0.1 mg metered aerosol spray x 2. |
| Pharmacology/ Action | Beta 2 agonist.<br>Bronchodilation.<br>Relaxation of smooth muscle. |
| Side effects | Tachycardia.<br>Tremors.<br>Tachyarrthymias. |
| Long-term side effects | High doses may cause hypokalaemia. |
| Additional information | It is more efficient to use a volumizer in conjunction with an aerosol inhaler when administering Salbutamol. |