



CHECKLIST - Emergency Medical Kits

The purpose of an Emergency Medical Kits (“EMK”) is to enable registrants to respond to a range of emergency medical conditions which may occur. The College of Naturopathic Physicians of British Columbia recommends that all registrants maintain an EMK within their clinic. This document contains two checklists setting out the *minimum* requirements for those kits.

- Checklist #1 applies to all registrants;
- Checklist #2 applies to registrants who hold certification in *Prescriptive Authority*.*
- Attached to this document as Schedule “A” is the pharmacology of required medications.

All contents of the EMK should be organized (kept in date order), available for immediate use and regularly checked to ensure they are not expired.

Basic EMK - For <u>all</u> clinics and places of practice	Checklist #1
- First Aid Kit with pocket mask	
- Aspirin (heart attack/stroke)	
- Diphenhydramine for oral administration, both as tablets and syrup (non-prescription, e.g. Benadryl)	
- Epi-Pen (no prescription required)	
- Glucose tablets, or equivalent (50% Dextrose/other hypoglycemic remedies, e.g. juice)	
- Glucometer	
- Oxygen, any grade, with attachments for inhalation via mask or cannula	
- Smelling salts	
- Surgical gloves	
Advanced EMK - Additional requirements for registrants certified in <i>Prescriptive Authority</i> *	Checklist #2
- Diphenhydramine for injection	
- Epinephrine and its salts for injection (1:1,000); syringes for administration (either as an Epi-Pen or epinephrine ampoules)	
- Nitroglycerin (immediate release sublingual tablets or sprays)	
- Salbutamol (metered dose inhaler)	
Other *optional, not required*	
- AED / Defibrillator	
- Naloxone	
- Pulse Oximeter	
- Saline / D5W and IV equipment for administration	

*Reminder: All registrants who hold certifications are required to maintain current qualifications in ACLS or NCLS; all other registrants are required to maintain current qualifications in CPR-HCP.

Schedule A

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Autonomic Nervous System

- 2 Divisions:
 - o Sympathetic
 - o Parasympathetic
- ANS + endocrine system controls the internal environment:
 - o Adjust internal organ function to the changing needs of the organism
 - o Neural control permits quick adaptation
 - o Endocrine system provides for long-term regulation of functional states
 - o Operates largely beyond voluntary control
 - o Functions autonomously
 - o Central components: hypothalamus, brain stem & spinal cord
- Sympathetic Division:
 - o Purpose:
 - Perceive external states
 - Target appropriate body movement.
 - E.g. the means by which the body achieves the state of maximal work capacity required for flight or fight situations.
 - o Vigorous skeletal muscle activity
 - o Adequate supply of oxygen, nutrients and blood flow to skeletal muscles
 - o Cardiac rate and contractility enhanced
 - o Narrowing of splanchnic blood vessels diverts blood flow to skeletal muscles
 - o Propulsions of intestinal contents is slowed: peristalsis diminishes and sphincter tone increases: digestion is dispensable & counterproductive to escape
 - o Bronchi are dilated: increase tidal volume & alveolar O₂ uptake
 - o Sweat gland activity increased

Diphenhydramine e.g. 'Benadryl®' (Pharmacology)

- Pharmacology:
 - o Type 1 antihistamine (H1)
 - o Direct binding to histamine receptors via competitive inhibition
- Availability:
 - o Tablets: 25mg, 50 mg
 - o Oral syrup: 6.25 mg/5mL
 - o Chewable tablets: 12.5 mg
 - o Parenteral: 50 mg/mL
 - o Cream 2% w/w
- Dosing: Maximum 4 doses/day:
 - o Oral adult: 25 to 50 mg q6 to 8hr
 - child (6 to 12): 6.25 to 12.5 (5 to 10mL)
 - infant (2 to 5): 6.25 (5mL)
 - pediatric (<2): 3.125mg (2.5mL)
 - o IM: 0.5-1ml q6 to 8hr
- Precautions:
 - o CNS depressant: avoid other depressants, like alcohol or sedatives
 - o Atropine like effect: use caution in asthma, increased intraocular pressure, hyperthyroidism, cardiovascular disease or hypertension
- Side Effects:
 - o Drowsiness
 - o Dizziness
 - o Dry mouth
 - o Nausea
 - o Nervousness
- Warnings:
 - o Narrow angle glaucoma
 - o Stenosing peptic ulcer
 - o Pyloroduodenal obstruction
 - o Symptomatic prostatic hypertrophy
 - o Bladder neck obstruction
 - o Topical: do not use on chicken pox, measles, or extensive areas of skin
 - o Infants and children:
 - Over dosage may cause hallucinations, convulsions and death
 - May produce sedation or excitation

Epinephrine e.g. 'Adrenalin®' (Pharmacology)

- Pharmacology:
 - o Secreted at the second neuron of the sympathetic NS
 - o This neuron branches out and each branch makes contact with several cells
- Effects of Sympathetic Stimulation:
 - o CNS - increase drive, increase alertness
 - o Eyes - pupil dilation
 - o Saliva - little, viscous

- Bronchi – dilation
- Heart - increase rate, increase force, increase BP
- Skin – perspiration
- Fat Tissue - lipolysis, fatty acid liberation
- Liver - glycogenolysis, glucose release
- GI Tract -decrease peristalsis, increase sphincter tone, decrease blood flow
- Bladder - increase sphincter tone, decrease detrusor muscle
- Skeletal Muscle - increase blood flow, increase glycogenolysis
- Adrenoreceptor Subtypes (4):
 - Alpha1, Alpha2, Beta1, Beta2
 - Agonists mimic the effect of naturally occurring catecholamines
 - Different adrenoreceptors are distributed according to region and tissue
 - Norepinephrine acts at alpha & beta receptors
 - *'Most potent alpha receptor activator'*
- Uses:
 - Respiratory distress from bronchospasm
 - Anaphylaxis or severe allergic reaction (angioedema, urticaria)
 - Prolong the action of infiltration anesthetics
 - Cardiac effect may be useful in restoring normal cardiac rhythm esp. ventricular fibrillation or pulseless ventricular tachycardia 7
- Availability:
 - 'Epi Pen' 2mL of 1:1000 solution, delivers 0.3mg per injection
 - 'Epi Pen JR' 2mL of 1:2000 solution, delivers 0.15mg per injection
 - Parenteral solution: 1:1000 (1mg/mL) in isotonic saline 1m; ampoules or 30mL multi-dose vials
 - Topical solution: 1:1000, 30mL
- Dosing:
 - IM or sc: 0.3 to 0.6 mL of 1:1,000 solution (weight dependent; sc is preferred; avoid buttock) (q 10-15 mins)
 - Cardiac arrest: slow IV 0.1 – 0.25 mg of 1:10,000 solution (q 10mins) alternating with electroshock (with CPR)
 - Pediatric bronchial asthma: 0.01mL/kg (max 0.5mL) q 4hr prn
- Side Effects:
 - Transient and minor at therapeutic dosages:
 - anxiety
 - headache
 - fear & palpitation
 - Repeated injections at the same site can cause tissue necrosis
- Contraindications:
 - Narrow angle glaucoma
 - With local anesthetic use in certain areas: toes, fingers (increased tissue sloughing)
 - Labour: may delay second stage
 - Cardiac dilatation

- Coronary insufficiency
- Warnings:
 - Degenerative heart disease
 - Over-dosage or IV administration: sharp rise in BP may cause cerebrovascular hemorrhage
 - Fatalities may result from pulmonary edema caused by the peripheral constriction & cardiac stimulation

[Rapidly acting vasodilators such as nitrates or alpha-blockers may counteract this]

- ➔ None of the above should deter the use of adrenaline for the treatment of serious allergic shock or other emergency situations

Precautions:

- Protect from light exposure
- Do not inject if solution appearance is changed:
 - Pink, darker than slightly yellow or precipitated
- Readily destroyed by alkalis & oxidizing agents (O₂, Cl, Br, I, permanganates, chromates, nitrites, salts of easily reducible metals such as iron)

Histamine (Pharmacology)

- Pharmacology:
 - 'Biogenic amine'
 - Stored in basophils and tissue mast cells
 - Role in inflammatory and allergic reactions
- Tissue effects:
 - Bronchoconstriction
 - Increased intestinal peristalsis
 - Dilation & increased permeability of capillaries
 - Gastric mucosa: (+) parietal cell acid secretion (H₂)
 - CNS: neuromodulator
- Most histamine antagonists also block other receptors
- H₁ histamine antagonists:
 - Symptomatic relief of allergies (e.g. Benadryl)
 - Antiemetic (e.g. Gravol)
 - OTC sedative (e.g. Sominex, Nytol)

H₁ Antihistamine Side Effects (1st Generation):

- Sedation
- Impaired muscle coordination
- Anticholinergics effects:
 - Dry mouth
 - Constipation
 - Urinary retention
- 2nd generation agents are generally void of these side effects but are considered optimal for stat use during anaphylaxis

Nitroglycerin (Pharmacology)

- Pharmacology:
 - Ester of nitric acid & polyvalent alcohol (glyceryl trinitrate)
 - Organic nitrates are pro-drugs
 - Denitration liberates nitric oxide (endothelium derived relaxing factor)
 - Relaxes vascular beds, venous > arterial
 - Therapeutic hemodynamic consequences:
 - Decrease preload (venous return, ventricular volume)
 - Decrease afterload (arterial)
 - Decrease cardiac work
 - Increase O₂ balance
 - Prevents spasm of larger coronary arteries
- Availability:
 - Sublingual tablets: 0.3, 0.6 mg
 - Sprays: 0.4mg per spray
 - Transdermal patch: 0.2, 0.3, 0.4, 0.6, 0.8 mg
 - ISDN: 10mg, 30mg
 - ISMN: 60 mg
- Dosing:
 - 1 or 2 doses sublingually stat; if chest pain continues, repeat every 5 minutes to a maximum of 3 doses
 - If chest pain continues, go to the Emergency Room or call 911
 - Prophylaxis: 1 dose taken 5 to 10 minutes prior to strenuous activity
- Uses:
 - Acute symptomatic relief of angina pectoris
 - Continuous use causes loss of efficacy which can be avoided if a daily 'nitrate free' period is maintained (for patch use)
 - Efficacy is restored with a 12hr nitrate-free period
- Side Effects:
 - Headache from cerebral vessel dilatation
 - Excessive dosages:
 - Hypotension
 - Reflex tachycardia
 - Circulatory collapse
- Nitro-lingual pump spray:
 - Hold upright. Do not shake
 - 'Prime' prior to first use (3 sprays)
 - 'Re-prime' if not used within 14 days (1 spray)
 - Angina attack: 1 or 2 sprays on or under the tongue. Do not inhale.
 - Dosage may be repeated at 5 or 10 minute intervals
- Nitrostat Tablets:
 - Dissolve tablets sublingually or in buccal pouch
 - Repeat dose every 5 minutes (max 3 doses)
 - Repeated opening of container will diminish the efficacy of tablets
 - Discard cotton

- Keep in original container, protected from light
- Once opened, the bottle must be replaced after ~3-6 months (depends on manufacturer)
 - Stinging/tingling when tablet placed under the tongue does not indicate tablet potency
- Contraindication/Precautions:
 - Early MI: long-acting forms (causes XS hypotension)
 - Hypotension
 - Uncorrected hypovolemia (may precipitate shock)
 - Head trauma (increases intracranial pressure)
 - Keep away from heat
- Drug interactions:
 - Alcohol: additive hypotensive effect
 - Ergot alkaloids: negative effect
 - Heparin: heparin resistance. Monitor INR
 - Hypotensive agents
 - Salicylates: ASA > 500 mg may decrease Nitrate metabolism, increasing side effects
 - Sildenafil (Viagra®): concurrent use may cause severe hypotension, loss of consciousness, heart attack or death

Oxygen (Pharmacology)

- Availability:
 - Medical O2: 99.9%
 - Technical: 95-98%
- Use: assist breathing to increase O2 saturation of hemoglobin
- High Flow (> 10L/min)
 - All short of breath patients
 - Hypoxia
 - Artificial respiration or CPR being performed
 - Unconscious/reduced consciousness (GCS<13)
 - Shock of all kinds
 - Hypovolemia
 - Anaphylactic
 - Septic
 - Neurogenic
- Low Flow:
 - Emphysema (nasal cannula)
 - Try successive flow rates x 2 min each
 - Talk to the patient
 - 'What would you normally do?'
- Side Effects:
 - Drowsiness from excess flow rate
 - Flow rate 6L = ambient air
 - Flow rates <6L 'hypoxic'

- Contraindications:
 - o Hyperventilation
 - o Emphysema: CO₂ does NOT trigger next breath

Salbutamol Metered Dose Inhaler (Pharmacology)

- Pharmacology:
 - o Beta2 sympathomimetic
 - Site of action: bronchial smooth muscle (dilatation)
 - Measurable decrease in airway resistance (onset) 5 to 15 minutes after inhalation
 - Maximum effect: 60 to 90 minutes
 - Duration of action: 3 to 6 hours
 - o Uses:
 - Intended for management of acute asthmatic attacks
 - Not intended for prophylaxis or long-term disease stabilization steroid (inhaled/oral) +/- mast cell stabilizer
 - Use > 3x/week indicates disease is not adequately controlled
 - o Availability: 100µg/puff
 - o Dosing: 1-2 puffs q4-6hr
 - Max 8 puffs/24hr
 - Child: max 4 puffs daily
- ➔ It is recommended to test spray salbutamol inhalation aerosol into the air 4 times before using any canister for the first time and in cases where the aerosol has not been used for more than 4 weeks
 - o Side Effects:
 - Heart: increase rate, increase force, increase BP
 - Most common is nervousness and tremor; headache, tachycardia, palpitations, transient muscle cramps, insomnia, weakness, dizziness and sweating
 - Paradoxical bronchoconstriction
 - o Warnings:
 - Beta blocking drugs, esp. non cardio-selective, should be avoided (i.e., propranolol)
 - o Drug Interactions:
 - Use extreme care with MAO inhibitors & tricyclic antidepressants (potentiate cardiovascular effects)

Smelling Salts (Pharmacology)

- Aromatic liquid of ammonium carbonate
- Reflex respiratory stimulant for the treatment of 'hysterical' syncope
- No longer used by paramedics
- Replaced by oxygen

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