

THE HOUSE-CALL BAG

TIME FOR A REVAMP

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ABSTRACT

The house-call bag should contain drugs to treat both emergency and other serious medical conditions. Knowing what drugs and equipment to carry in the bag enables the physician to handle out-of-office emergency house-call with confidences. Storage and maintenance of the drugs in the doctor bag should be considered in order to ensure that the drugs especially the parenteral drugs are not expired and effective when given for life-threatening conditions.

Keywords: out-of-office emergency, parenteral drugs, maintenance

INTRODUCTION

In the past, family doctors were frequently seen doing their house calls with the “trusty black bag”. Miracles of medicine were performed using drugs carry in the bag before patients at bedsides with shock and awe from relatives. With the revolutionary changes in medicine, improved health-care delivery and better trained paramedics, house-call became rarity and with it the need for a good house-call bag became irrelevant to our local practitioners.

Although majority of the house-calls made are of non-emergency in nature such as non-ambulatory chronically-ill geriatrics and demanding patients who would like to be seen and treated at homes instead of in the clinics, there are occasional instances when physicians are summoned for emergencies that occurred out-of office, in homes and in public areas. Prompt and right interventions at the scene of emergency before the arrival of ambulances can improve the outcomes of survival for the severely ill patients. The only equipment of most important to the attending physician is the house-call bag.

Hence, a revamp of house-call bag may be timely and necessary to meet the the multi-tasks of the housecall doctors in out-of-hospital resuscitations.

WHICH BAG TO USE

By common definition, the doctor bag or locally termed the house-all bag is that of a container of equipment and medications which when combined with the knowledge of the physician gives relief to the suffering and often is the difference between life and death.

The house-all bag chosen should be lightweight, easy to carry, shockproof, all-weather proof and preferably with spacious interiors with different compartments and with combination locks. The traditional black leather bag is commonly used by physicians. However, the interior temperature of black leather bag during visiting in hot day times can exceed the thermal stability of drugs especially the parenteral drugs. Thus, it would be more appropriate to choose house-call bag made of light plastic materials and preferably silver colour to reduce the internal temperature of house-call bag. It difficult terrains to access such as ship-calls, hands-free haversack with backstraps is easier to carry.

Hence, the choice of bags depends on the nature of house-calls made. It is not uncommon for family doctors to carry along two house-call bags so that more drugs and equipment can be brought along during emergency calls.

Finally, availability and costs of bag are factors to consider in getting the right bag for the right occasion.

DECIDING WHAT TO CARRY

The choice of drugs and equipment to carry in the house-call bag depends on several factors and varies from physicians. The factors mainly are the practice locations, types of emergency calls frequently anticipated, the prescription protocols as well as the design and capacity of bags¹. A family physician practicing in residential areas would require different armamentarium of drugs and equipment from physicians practicing in heavy industrial areas such as petroleum refinery plants, shipyards, construction sites and heavy passengers transit areas. More drugs and equipments for treatments on the scene, usually resuscitations and stabilizations of life and limbs trauma are required for such practices, often than not, with dramatic results before arrival of paramedics.

A good house-call bag should comprise the basic contents and these are:-

- o Parenteral drugs (Table 1)
- o Oral drugs, Inhalers, Rectal Preparations, Crystalloids (Table 2, 3, 4)
- o Basic bedside diagnostic and first-aids kits.

Table 5 (appendix) lists the commonly used intravenous drugs and dosages as well as other essential medications for adults in the house-call bag. The guides are compiled from American Heart Association (AHA) Guidelines 2000, MIMS Annual Singapore 2003, MIMS Cardiovascular Guide Singapore 2002/ 2003 and Survival Guide On Acute Medicine, National University Of Singapore 1999.

Table 1: Commonly Used Parenteral Drugs In House-call Bag^{1,2,3}

Adrenaline (1:1,000) (1:10,000) EpiPen Auto injector 0.3mg	Frusemide 20mg/2mL (Lasix)
Atropine 0.6mg/mL	Hyoscine Butyrbromide 20mg/mL (Buscopan)
Aminophylline 500mg/2mL	Hydrocortisone 100mg powder
Amiodarone 150mg/3mL	Lignocaine 1% (Xylocaine) 50mg/5mL
Cloxacillin 500mg powder	Morphine Sulphate 10mg/ampule
Ceftriaxone 1 gram powder	Midazolam 15mg/3mL (Dormicum)
Dopamine 40mg/mL x 5mL	Meteochlorpramide 10mg/mL (Maxolon)
Diazepam 10mg/2mL	Pethidine 50mg/mL
Dextrose 50% x 20mL	Prochlorperazine 12.5mg/mL (Stemetil)
Diclofenac 75mg/3mL (Voltaren)	Promethazine 50mg/2mL (Phenergan)
	Progesterone 50mg/mL
	Salbutamol 5mg/5mL

PARENTERAL DRUGS

The parenteral drug should be relatively safe for home-visits and simple to use. The parenteral drugs must be able to treat the common acute medical emergencies and life-threatening illness conditions. More sophisticated intravenous drugs (IV), which require intensive monitoring, should be reserved for hospital use¹.

Recent developments in the parenteral drugs and practice guides are:-

IV Amiodarone (150mg/3mL) is increasingly being used in UK as the first drug for out-of-hospital pulseless Ventricular Tachycardia (VT) and Ventricular Fibrillation (VF) resistant to three direct current defibrillations during cardiac arrest. In the ARREST study (Amiodarone in the Out-Of-Hospital Resuscitation Of Refractory Sustained Ventricular Tachyarrhythmias), recipients of amiodarone had a higher survival rate to hospital admission (44%) as compared to placebo group (34%)⁶.

In The ALIVE study (Amiodarone versus Lignocaine In Prehospital VF Evaluation), recipients of amiodarone had a higher survival rate to hospital admission (22.8%) as compared to the 12% from the lignocaine group⁷. The new guideline recommends dilution of 300mg (5 mg/kg body weight) of amiodarone in 20-30 ml of dextrose 5% water with the special kit provided. The major side effects are hypotension and bradycardia¹³.

EpiPen Autoinjector (Adrenaline 0.3 mg) for treatment of anaphylaxis, comes in prefilled syringe for rapid intramuscular administration through the lateral thigh.

IV Salbutamol (Ampule 1 mg/ml x 5 mL) replaces Terbutaline for relieving bronchospasm due to severe bronchial asthma or status asthmaticus when nebulization is not available or possible. The dosages are IV 250eg (4 eg/kg body weight) injected slowly or IM /SC 500eg (8 eg/kg body weight) repeated 4 hourly^{10,12}.

IV Glucagon (1 mg) for treatment of hypoglycemia coma in insulin dependent diabetes mellitus. The new guideline

recommends that if there is no response to IV glucagon 1mg after 10 minutes, Dextrose 50% bolus should be administered^{2,12}.

ORAL DRUGS

The oral drugs are given either via oral route (PO) or sublingual route (SL). The non-parantereal drugs are sometimes combined with the intravenous drugs to improve best outcomes. More often than not, the oral preparations are prescribed on the scene when patients medical complaints turned out to be false emergency. For example, heartburns mimicking as unstable angina.

Aspirin 300mg should be administered orally as soon as possible in acute coronary syndrome. The new guideline recommends chewing instead of swallowing for rapid absorption of aspirin. In patients who are intolerant to aspirin, the alternatives are Clopidogel (Plavrix) 300mg or Ticlopidine (Ticlid) 25mg^{8,11,13}.

Oral Antibiotics in the house-call bag is dependent on individual preferences and practice guidelines. However, it is useful to include at least one parenteral antibiotics for emergency treatment of the rare acute meningitis syndrome. In our local context, IV Ceftriaxone is commonly used as alternative to IV Benzathine Benzylpenicillin. The recommended dosage for acute meningitis syndrome is IV Ceftriaxone 2 grams and has to be given within 30 minutes after onset^{9,10}.

Table 2: Commonly Used Oral Preparations In House-call Bag

Aspirin 100mg (Cardiprin)	Dormicum 15mg
Amoxycillin 250mg	Erythromycin (EES 400mg)
Cloxacillin 250mg	Glyceryl Trinitrate 500ug SL (Angised)
Cephalexin 250mg	Isosorbide Dinitrate 10mg
Ciprofloxacin 250mg	Loperamide 2 mg
Cetirizine 10mg (Zyrtec)	Meteochlorpramide 10mg
Chlorpheniramine 4 mg	Omperazole 20mg
Diclofenac 25mg, 50mg	Paracetamol 500mg
Diazepam 5mg, 10mg	Prednisolone 5mg
	Prochlorperazine 5mg
	Replayme

INHALATIONAL PREPARATIONS AND OTHER PREPARATIONS

Table 3: Commonly Used Inhalation Preparations And Rectal Preparation In House-call Bag

Ventolin Nebules 5mg/2.5mL, Nebules 2.5mg/2.5mL	Diazepam (Stesolid) Rectal Tube 5mg/2.5mL
Resp Soln 5mg x10mL	
Metered Dose Inhaler 100ug/actuation	
Ipratropium Br Inhalation Soln 0.025% x 20mL	

CRYSTALLOIDS

The isotonic electrolytes solutions are used for initial fluid resuscitation secondary to hypovolemia shock and hemorrhagic shock by providing transient intravascular expansion. The Hartmann solution (Ringer Lactate solution) is the initial fluid of choice. Normal Saline 0.9% is the second choice¹⁴.

Table 4: Commonly Used Crystalloids In House-call Bag

Hartmann Solution 500mL x 2
Normal Saline 0.9 % 500mL x 2
Dextrose 5%water 500mL x 2

BASIC DIAGNOSTICS KITS AND FIRST AIDS EQUIPMENT

A house-call bag should include basic diagnostic kits such as blood pressure apparatus, stethoscope, reflex hammer, thermometer, flashlight as well as sterile syringes, needles and containers. With the recent improvements made on ambulatory rapid diagnosis, it is useful to update the house-call bag with new diagnostics kits. Portable ECG machines and defibrillators are heavy and difficult to carry but are optional equipment to consider especially in practices where cardiac emergencies are commonly encountered.

Basic first aids equipment should also be included in the house-call bag to handle home trauma and the unexpected call to attend to vehicles accidents.

STORAGE AND MAINTENANCE OF THE HOUSE-CALL BAGS

Storage of the bag. House-call bag must be kept in a cool area within the clinic as well as in the boot or floor of the car when visiting and removed from the car after visiting⁴. The factors to consider in the storage of house-call bag are the interior temperature of bag, temperature change within the bag and vibrations to the bag.

The temperature of the interior of the house-call bag should be monitored regularly with a glass thermometer kept in the bag. This is to ensure that thermal labile drugs are not damaged by heat build-up within the bag. The common practice here is to leave the bag in the car during and sometimes stored in the car boots after house-call. Studies in UK has shown that the interior temperature of the bag was always higher than the ambient temperature and frequently exceeded the thermal stability range of most emergency drugs⁴.

The commonly accepted temperature range quoted by drugs manufacturer for most of the emergency drugs is within room temperature and products licenses do not cover for adverse effects and liability to patients arising from storage and transport of drugs, especially the emergency drugs¹². For example, adrenaline may be ineffective when subjected to extreme thermal stress.

Depending on where the bag is stored in the car, the interior temperature can reach as high as 40 degree Celsius in local climate. It has also been shown that using silver colour instead of black bag can reduce the interior temperature of the bag significantly⁴.

The rate of temperature change and the cyclical temperature change in the bag can aggravate particle growths and crystals formation. Hence ensuring that the drugs in the bag are stored within a constant temperature range as recommended instead of subjecting the drugs to heat-freeze-thaw cycle.

Avoid constant vibrations of bags commonly felt in car. The effects may result in coalescence and flocculation of certain emergency drugs.

Maintenance of the bag. Drugs for use in doctor bag should be checked regularly to ensure that they have not passed their expiry dates. My preference is for the blister-packed oral medications as the expiry dates are easily available and occupied minimum spaces in the bag. Controlled drugs should be stored in locked bag and a careful record made on their uses. Light-sensitive drugs such as Stemetil Injection and Nitroglycerin tablets should be kept in silver-foils covers and dark container provided respectively.

FUTURE DEVELOPMENTS OF THE BAG

With recent advances in cardiac drugs and revisions of advanced cardiovascular life support guidelines, the drugs carried in a doctor bag must evolve with the new developments. Innovative hardwares such as rapid bedside diagnostic kits, portable hand-held nebulizer and cardiac drugs are regularly being approved for practical uses in ambulatory medicine.

Nonetheless, out-of-hospital resuscitations and emergencies are still stressful events for even the experienced family doctors. The next time before you leave for a house-call, check that the necessary drugs and apparatus are available in your bag.

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Information Sources: The information used in this review article are from texts (reference 1, 2, 3), guidelines (reference 10, 11,12,13, 14) and journals (reference 4, 5, 6, 7, 8, 9). The author personal experience has also been used to provide a practice focus on this subject.

LEARNING POINTS

- o Customised the house-call bags and the drugs to fit your nature and location of your practices. For example, a haversack type of bag may be needed for climbing up ships.
 - o A good house-call bag should carry the essential drugs for out-of-hospital-resuscitations and medical emergencies. It should include combinations of parenteral drugs and the oral preparations.
 - o Storing the house-call bag in a cool place within the clinic and in the boot and on the floor of the car during visiting helps the drugs to be usable at all times. After visiting, house-call bag should be removed from the car. Maintain the bag to be ready for use at all times.
 - o Controlled drugs must be kept under locked at all times and a record made on their uses. Regular checks on the drugs must be carried out to ensure that the drugs have not passed the expiry dates.
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APPENDIX

Table 5: COMMONLY USED INTRAVENEOUS DRUGS AND OTHER MEDICATIONS FOR ADULTS

(NB: The dosages are guides from the recommendations in references (10, 11, 12, 13, 14). Deviations are permissible based on individual cases)

Drugs (I) Cardiac Drugs	Indications	Adult Dosages	Precautions
ADRENALINE <i>(Inj 1mg/ml)</i> Available:- 1:1,000 concentrations 1:10,000 concentrations Epipen Autoinjector 0.3mg	1. Cardiac arrest: ventricular fibrillation (VF), pulseless ventricular tachycardia (VT), asystole, pulseless electrical activity (PEA). 2. Profound bradycardia (second drug after atropine) and hypotension during resuscitation. 3. Anaphylaxis, severe allergic reactions: Combine with large fluid volumes, corticosteroids, antihistamines. 4. Severe acute asthma, status asthmaticus. Combine with oxygen, bronchodilators, corticosteroid.	1. Cardiac arrest: IV Dose: 1mg (10mL of 1:10,000) solution administered every 3 to 5 minutes during resuscitation. Follow each dose with 20mL IV flush. Tracheal Route: 2 to 2.5mg (2-2.5mL of 1:1,000) diluted in 10mL normal saline. 2. Profound Bradycardia and Hypotension: 2 to 10 μ g/min infusion (add 1mg of 1,000 to 500mL normal saline; infuse at 1 to 5mL/min). 3. Anaphylaxis: IM Dose: 0.3mg to 0.5mg (0.3mL to 0.5mL of 1:1,000) Epipen Autoinjector: IM single dose of 0.3mg to outer lateral thigh. May be repeated every 15 minutes if no response. For severe anaphylactic shock: IV Dose: 0.1mg to 0.25mg (1 to 2.5mL of 1:10,000) every 5 to 15 minutes slowly and cautiously. 4. Status Asthmaticus: SC/IM Dose: 0.3 to 0.5 mg (0.3 mL to 0.5mL of 1:1,000) every 15 minutes.	> Raising blood pressure and increasing heart rate may cause myocardial ischemia, angina and increased myocardial oxygen demand. (Give oxygen) > No buttock injection for IM adrenaline.
ATROPINE SULPHATE <i>(Inj 0.6mg/mL)</i>	1. Symptomatic sinus bradycardia. 2. Asystole or bradycardic pulseless electrical.	1. Sinus bradycardia: IV Dose: 0.5 to 1 mg every 3 to 5 minutes as needed. Not to exceed total dose of maximum dose of 0.04mg/kg. 2. Asystole or Pulseless Electrical Activity: IV Push: 1mg. Repeat every 3-5 minutes. Tracheal Route: 2 to 3mg diluted in 10mL normal saline.	> Increases myocardial oxygen demand. Use with caution in presence of myocardial ischemia and hypoxia. > Not effective for infranodal (Mobitz type II) AV block.
LIGNOCAINE 1% (Without preservatives) <i>Ampule:</i> 50mg/5ml 200mg/20ml	Cardiac arrest from ventricular fibrillation (VF) and ventricular tachycardia (VT).	Initial Dose: IV Push 1 to 1.5mg/kg. For refractory VF, may give additional 0.5 to 0.75-mg/kg IV push. (Maximum total dose is 3mg/kg) Tracheal route: 2 to 4 mg/kg Maintenance Infusion: 1 to 4 mg/min (30 to 50 μ g/kg/minutes)	> Narrow therapeutic and toxic window. Titrate dose carefully. Therapeutic dose is 2 to 6 mg/L. Toxic dose is 9 mg/L. > Discontinue infusion immediately if signs of toxicity develop (drowsy, dizzy, double or blurred vision, numbness, tinnitus, tremors.) > May cause convulsion, coma, respiratory arrest, hypotension and CVS arrest.
AMIODARONE <i>(Inj 150mg/3mL)</i> Note: Dilution to 20 to 30 mL Dextrose 5% water.	Cardiac arrest: Treatment of refractory ventricular fibrillation and pulseless ventricular tachycardia after DC shock.	Cardiac arrest: IV Push 150-300mg. May consider additional 150mg IV Push in 3 to 5 minutes in refractory VF or pulseless VT. Maximum cumulative dose is 2.2g/IV/24 hours.	> May produce hypotension and bradycardia. > May prolong QT interval. Be aware of compatibility and interaction with other drugs administered. Do not mix with other preparation in the same syringe. > Only dextrose 5% water should be used for dilution. > Terminal elimination is extremely long (half-life up to 40 days).

Drugs (I) Cardiac Drugs	Indications	Adult Dosages			Precautions
DOPAMINE <i>(Inj 200mg/5mL)</i> Mixed 200mg in 250mL Dext 5% water OR 400mg in 250 mL Dext 5% water	Inotrope/Pressor. 1. For cardiogenic shock (systolic blood pressure less than 90mmHg) during resuscitation. 2. May use in hypovolemia shock but only after volume replacement.	Continuous IV Infusions: (Titrate to patient response) Low Dose (renal dose) 1 to 5 eg/kg per minute. Moderate Dose (cardiac dose) 5 to 10 eg/kg per minute. High Dose (vasopressor dose) 10 to 20 eg/kg per minute.			> May increase heart rate and tachyarrhythmia. Caution in congestive heart failure. > Taper slowly.
FRUSEMIDE <i>(Inj 20mg/2ml)</i>	1. For adjuvant therapy of acute pulmonary edema in patients with systolic blood pressure > 90 to 100 mmHg (without signs and symptoms of shock). 2. Hypertensive emergencies. 3. Increased intracranial pressure. 4. For Diuresis. Oedema due to congestive cardiac failure, hepatic failure (ascites). Oedema due to renal disease (in the nephrotic syndrome, therapy of the underlying disease has precedence).	For acute pulmonary edema, increased intracranial pressure, hypertensive crisis: IV Dose: 0.5 to 1mg/kg over 1 to 2 minutes. For Diuresis: IM Dose: 20-40mg.			Dehydration, hypovolemia hypotension, hypokalemia or other electrolyte imbalance.
NITROGLYCERIN - <i>sublingual tablet</i> - <i>IV (for hospital use)</i> Available: - <i>Glyceryl trinitrate tablet (500 eg)</i> - <i>Isosorbide dinitriate tablet (5 mg), 10mg tablet, sublingual</i>	1. Acute attack of angina pectoralis including variant angina. 2. Prophylaxis of angina. 3. For adjuvant treatment of acute pulmonary edema.	1. Acute Attack Angina: SL: 1 tablet every 3 minutes until pain or side-effects. (maximum; 3 doses) 2. Prophylaxis of Angina: SL: 1 tablet prior to activity that is likely to precipitate angina. 3. Adjuvant Treatment Acute Pulmonary edema: Repeated Sublingual 0.5mg at 5-10 minutes. Discontinue if hypotension develops.			> Minor side effects when used oral or sublingual. Headache, facial flushing, dizziness, tachycardia, hypotension, syncope. > Use of sildenafil is contraindicated. > Light sensitive. Stored in dark glass container. > SL: Sublingual route.
ASPIRIN Available: <i>Tablet 100mg (Cardipin)</i> <i>Tablet 81mg (Bufferin)</i>	Administer to all patients with acute coronary syndrome, particularly reperfusion candidates. Any patients with symptoms suggestive of ischemic heart pain.	300mg tablet PO taken as soon as possible (chewing is preferable to swallowing) and then 81 to 100mg PO daily. To be given within minutes of arrival. Alternative to aspirin Clopidogel (Plavrix): 300mg initially PO and then continue with 75mg PO. Ticlopidine (Ticlid): 25mg bd PO (Monitor platelet and white blood count).			> Relatively contraindicated in active peptic ulcer disease or asthma. > Contraindicated in patients with known hypersensitivity to aspirin. > PO: oral route.
MORPHINE SULPHATE <i>(Inj 10mg/amp)</i>	1. Chest pain with acute coronary syndrome unresponsive to nitrates. 2. Acute cardiogenic pulmonary edema. (If blood pressure is adequate)	1. Chest Pain: IV Dose: 2 to 4mg (over 1 to 5 minutes) every 5 to 30 minutes as needed. 2. Acute Pulmonary Edema: IV Dose: 2mg to 4 mg slowly (over 1 to 5 minutes). Monitor respiratory depression.			> Combine with anti-emetic agent (IV metoclopramide 10mg). > May cause respiratory depression and hypotension in volume-depleted patients. > Reverse with IV naloxone 0.4 to 2mg.
OXYGEN Delivered from portable tanks	Any suspected cardiovascular emergency, especially (but not limited to) complaints of shortness eg. breadth and suspected ischaemic chest pain.	Device Nasal prong Venturi mask Partial Rebreather mask Bag mask	Flow Rate (L/min) 1-6 4-8 6-10 15	O 2 (%) 24-44 24-40 35-60 up to 100	Observe closely when using on chronic obstructive pulmonary disease.

Drugs (II) Bronchodilators and Anti-Asthmatic Drugs	Indications	Adult Dosages	Precautions
SALBUTAMOL Available: <i>Nebules 5mg/2.5mL</i> <i>Nebulas 2.5mg/2.5mL</i> <i>Respiratory Solution (0.5% x 10mL)</i> <i>Inj 1mg/mL x 5mL</i>	Treatment of reversible bronchospasm in acute and chronic bronchial asthma and bronchospasm associated with chronic obstructive pulmonary disease (COPD).	For acute severe asthma: Nebulization Dose: 5mg (1mL of 0.5% respiratory solution in 2mL normal saline) or one nebule of 5mg/2.5 mL every 4-6 hrly. May combine with Ipratropium bromide at doses of 1mL (20 drops) every 4-6 hrly. SC/IM Dose: 500eg (8 eg/kg) every 4 hrly if no response to nebulization or if nebulization not possible. For Status Asthmaticus: IV Salbutamol: 250 eg (4 eg/kg) over one minute slowly and then followed by continuous infusion at 5-20 eg/min.	> May cause tremors, tachycardia, and metabolic disturbances. > Inhalation solution is not used for parenteral injection.
IPRATROPIUM BROMIDE (ATROVENT) Available: <i>nebulizing solution (0.025% x 20mL)</i>	Used concomitantly with inhaled beta-agonist for treatment of bronchospasm in acute asthma and acute exacerbation of COPD.	For acute COPD: Nebulization Dose: Higher dose 2mL of 0.025% (40 drops) combined with 5mg salbutamol nebulas every 4-6 hrly.	Cautious use in pregnant women.
AMINOPHYLLINE <i>(Inj 500mg/2mL)</i>	Second drug for acute severe asthma or status asthmaticus and acute COPD not responding to bronchodilators nebulization.	Loading Dose: 5mg/kg over 20 to 30 minutes. Maintenance Dose: 0.5mg/kg/hr every 8 hrly. OMIT LOADING DOSE when there is history of prior theophylline ingestion or unsure.	> Monitor theophylline level. (Therapeutic range: 10-20 eg/L) > Toxicity can cause headache, nausea, vomiting, arrhythmia, convulsion. > Lower dose in patients with cor pulmonale, liver failure, certain drugs (eg, quinolone, verapamil, erythromycin).
HYDROCORTISONE <i>(Solu-Cortef)</i> <i>Inj Hydrocortisone (100mg powder)</i>	1. Adjunctive treatment of acute allergic disorders and insect bites. 2. Adjunctive treatment of anaphylactic shock, status asthmaticus following adrenaline. 3. Shock secondary to adrenocortical insufficiency.	For acute allergic disorders and moderate Asthma: IM Dose: 50-100mg. PO Dose: Prednisolone at 0.5mg/kg/day 10-60mg/day). For anaphylactic shock, severe asthma, status asthmaticus, adrenocortical insufficiency: IV Bolus (30 sec-1 min) Dose: 100-200mg every 6 hrly (max: 15mg/kg) Followed by oral prednisolone.	> Anaphylactoid reaction after IV/IM dose can occur. (Rare). > Peptic ulceration and possible hemorrhage and perforation. > May cause raised blood pressure, hypernatremia, water retention and increased potassium excretion.
Drugs (III) Anti-histamines	Indications	Adult Dosages	Precautions
PROMETHAZINE <i>(Inj 50mg/2 mL)</i>	1. Adjunct treatment in anaphylactic shock and severe angio-oedema shock following adrenaline. 2. Mild angio-oedema, acute urticaria and allergic disorders.	For anaphylactic shock: and severe angio-oedema: IV Dose: 25-50mg slow bolus. For mild angio-oedema, urticaria, allergic disorders: IM Dose: 25-50mg.	
ORAL ANTI-HISTAMINES <i>- Tab chlorpheniramine 4mg (sedating)</i> <i>- Tab cetirizine 10mg (non-sedating)</i>	For mild allergic reactions, urticaria and pruritus. For follow-on treatment after IM/IV antihistamines.	PO Dose: Chlorpheniramine 4 to 8mg 8 hrly. PO Dose: Cetirizine 10mg daily.	

Drugs (IV) Anticonvulsants and Sedatives	Indications	Adult Dosages	Precautions
DIAZEPAM <i>(Inj 10mg/2mL)</i> Available: - Stesolid Rectal Tube 5mg/2.5ml - Tablet 5mg, 10mg	1. Convulsion/Status Epilepticus. 2. Rapid sedation of violent patients. Adjunct treatment of schizophrenia with disruptive, dangerous or assaultive behaviours. *(Alternative: Midazolam IV/IM) 3. Anxiety Disorders and insomnia.	For Convulsion/Status Epilepticus: IV Bolus Dose: 10mg Rectal Route: 10mg (if IV not possible) (Max: 20mg) For rapid sedation: IM/IV Dose: 5-10mg. (IV dose slowly). For anxiolytic and hypnotics: PO Dose: 2-10 mg.	> Depress respiratory system. Caution in patients with pulmonary insufficiency. > Myasthenia Gravis. > Patients already on medications that cause drowsiness. > Pregnancy/breastfeeding.
MIDAZOLAM <i>(Inj 15mg /3ml)</i> Available: <i>Tab 15mg</i>	1. For rapid sedation of violent patient. 2. Sedation, Insomnia.	Rapid Sedation: IV Dose: 10-15mg slowly IM Dose: 10-15 mg (if IV is not possible). Insomnia/Sedation: PO Dose: 7.5-15mg.	> May depress cardiorespiratory system. IV Dose given slowly. > Reduced dose in elderly.
Drugs (V) Anti-Vertigo and Anti-Emetic	Indications	Adult Dosages	Precautions
PROCHLORPERAZINE (STEMETIL) <i>(Inj 12.5 mg/mL)</i> Available: <i>Tab 5mg</i>	1. Nausea and vomiting associated with Meniere disease, labyrinthitis disorders and migraine. 2. Vertigo due to Meniere disease, labyrinthitis disorders.	IM Dose: 12.5 mg PO Dose: 5-10mg 3 times/day	> Caution in elderly. Use lower dosages. > Contraindicated in children. > Over dosages may result in extra pyramidal manifestations such as dystonia, dyskinesia, akathisia, and tremors, parkinsonism.
METOCLOPRAMIDE (MAXOLON) <i>(Inj 10mg/2mL)</i> Available: <i>Tab 10mg</i>	Nausea and vomiting associated with gastrointestinal tract disorders, drugs- intolerance such as cytotoxic drugs and opiates drugs, post-anesthesia, and migraine.	IM/IV Dose: 10mg PO Dose: 10-20 mg 3-4 times/day.	> Oculogyric crisis. (Give Slow IV Diazepam 5mg). > Rarely extra pyramidal reactions, tardive dyskinesia, mild sedation.
(VII) Anti-Spasmodic, Anti-peristaltic and Anti-ulcer ant Drugs	Indications	Adult Dosages	Precautions
HYOSCINE BUTYLBROMIDE (BUSCOPAN) <i>(Inj 20mg/mL)</i> Available: <i>Tab 10mg</i>	Acute gastrointestinal, biliary and renal colic.	IM/SC/IV Dose: 20-40mg 3-4 times per day. (Max: 100mg/day)	Caution in patients with megacolon, myasthenia gravis, glaucoma.
LOPERAMIDE <i>Tab 2mg</i>	Symptomatic control of diarrhea.	PO Dose: 4mg initially and then 2mg when necessary.	
OMPERAZOLE (LOSEC) <i>Tab 10mg, 20mg</i>	Peptic ulcer disease, acid-related dyspepsia, gastro-esophageal reflux.	PO Dose: 20-40 mg daily.	Pregnancy and lactation.

(VII) Analgesics, anti-Inflammatory, opiates	Indications	Adult Dosages	Precautions
PARACETAMOL <i>Tab 500mg</i>	Mild Analgesic. Antipyretic.	PO: 0.5-1g 3-4 times per day. (Max: 4 gram per day).	Liver toxicity if >8g/day.
DICLOFENAC (-Inj 75mg/3mL) Available: - <i>Tab 25mg/50mg</i> - <i>Tab 100mg SR</i>	Anti-inflammatory, Antirheumatic, Analgesic.	IM Dose: 75mg PO Dose: 25-50mg 2-3 times per day.	> Avoid in patients with active peptic ulcer disease, renal failure and cardiac failure. > Avoid in patients hypersensitivity to NSAIDs.
MORPHINE SULPHATE (Inj 10mg/amp) PETHIDINE (Inj 50mg/ml) <i>Inj 100mg/ml</i>	Potent analgesia for moderate to severe pain. IM/SC Dose: 0.1-0.15mg/kg 4 hrly.	For Morphine Sulphate: IM meteo-chlorpamide 10mg For Pethidine: IM Dose: 1mg/kg 4-6 hrly.	> Nausea and vomiting. (Give > Caution in patients with head injury and undiagnosed acute abdomen. > IV bolus hazardous and can cause respiratory depression.
(VIII) Endocrine and Hormonal Drugs	Indications	Adult Dosages	Precautions
DEXTROSE 50% 20mL	Hypoglycemia coma in diabetic.	IV Bolus: 20-40 mL. Follow up with Dextrose infusion.	Beware of extravasations.
GLUCAGON (Vial 1mg)	Hypoglycemia coma in diabetics.	IM/IV Dose: 1mg. If patient does not respond within 10 minutes, to give IV Dextrose 50% as above.	Hypersensitivity to glucagon.
PROGESTERONE (Inj 50mg/mL)	Dysfunctional uterine bleeding with polymenorrhea and menorrhagia.	IM Dose: 50-100mg.	Exclude abnormal pregnancy with irregular bleeding.
Drugs (IX) CRYSTALLOIDS	Indications	Adult Dosages	Precautions
HARTMANN SOLUTION 500ML NORMAL SALINE 0.9 % SOLUTION 500ML	Hypovolemia shock. (Hartmann solution is first choice). 0.9% Normal Saline if no Hartmann solution is available for hypovolemia shock.	Hypovolemia shock: Infuse 1-2 Litres of fluid FAST May consider dopamine infusion at 1-20 eg/min after fluid replacement. In haemorrhagic shock, after rapid fluids replacement, subsequent fluid replacement, is based on the "Rule of 3:1". For each ML of blood loss, replace with 3 ML of crystalloid.	Caution in patient with congestive heart failure.

Drugs (X) ANTIBIOTICS	Indications	Adult Dosages	Precautions
CLOXACILLIN 500mg powder Contraindicated in patients hypersensitivity to penicillin.	<p>1. Treatment of moderate severe and severe infection involving skin and soft-tissues caused by penicillinase-producing staphylococcus and other Gram-positive bacteria.</p> <p>2. Treatment of limb-threatening infection in diabetics before referral to orthopedics.</p> <p>(Alternatively: IV Augmentin (Amoxicillin-clavulanate) 1.2 gram twice per day if IV cloxacillin is not available).</p>	<p>For moderate severe/severe cellulites in non-diabetic: IV Cloxacillin: 1 gram 6 hrly. For mild cellulites: PO Cloxacillin 500mg 6 hrly OR erythromycin (EES) 400-800mg twice per day.</p> <p>For limb-threatening infection in diabetic: IV Cloxacillin in combination with IV ceftriaxone 0.5 - 1gram 12 hrly and IV Metronidazole 500mg 12 hrly.</p> <p>For non-limb threatening infection in diabetics: PO: Cloxacillin 500mg 6 hrly and oral amoxycillin 500mg 8 hrly OR cephelexin 500mg 6 hrly.</p>	<p>> For severe sepsis or SIRS (systemic inflammatory response syndrome), admit immediately to hospital for septic workout before IV antibiotics.</p> <p>> Empirical IV antibiotics can be given before septic workout for acute meningitis syndrome and if the source of infection causing sepsis is obvious eg. limb-threatening diabetics.</p> <p>> Prophylactic antibiotic is not given routinely for traumatic injuries such as burns, open-fractures and traumatic amputations unless indicated by specialists (14).</p>
CEFTRIAXONE (Rocephin) 1 gram powder Contraindicated in patients hypersensitivity to cephalosporin and beta-lactamase antibiotics	<p>1. Broad-spectrum cephalosporin for severe sepsis such as tonsillitis, severe urinary tract infection, Category 3 pneumonia, biliary tract infection, meningitis, GUT infection and severe skin and soft-tissue infections.</p> <p>2. For diabetic limb-threatening infection. It is given in combination with IV Cloxacillin and IV metronidazole.</p> <p>3. Acute meningitis syndrome. (Must be given within 30 minutes after onset.)</p>	<p>For Severe Sepsis: IV/IM Ceftriaxone 1-2 gram once daily or 500mg - 1 gram 12 hrly. (maximum: 4 gram/day in divided doses).</p> <p>For diabetic limb threatening infection: As above.</p> <p>For acute meningitis syndrome: IV Ceftriaxone 2-gram stat and 2 gram 12 hrly.</p>	<p>> As above.</p> <p>> Lacking or little activity against pseudomonas aeruginosa.</p>