

**Management of Acute poisoning:
A practical manual**



WARNING

Poisoning may occur if poison is swallowed, inhaled (either as a vapour or dust) or absorbed through the skin.

PERSONAL PROTECTION EQUIPMENT IS ESSENTIAL

Introduction

Acute poisoning by various chemicals is a common medical emergency in any country. A poison is any substance that through its chemical action (and sometimes through its physical action) impairs, injures or kills an organism. Strictly speaking, the term poisoning should be applied to accidental and unintentional exposure to a poison while overdose implies an intentional toxic exposure to a chemical that is used for various conditions or diseases.

Out of total poisoning cases it was found that more than 50% cases are Organo phosphorous compound (OPC). Others contain Unknown (commuter) poisoning, sedative (different substances) poisoning, corrosive poisoning etc.

This manual will focus on three aspects:

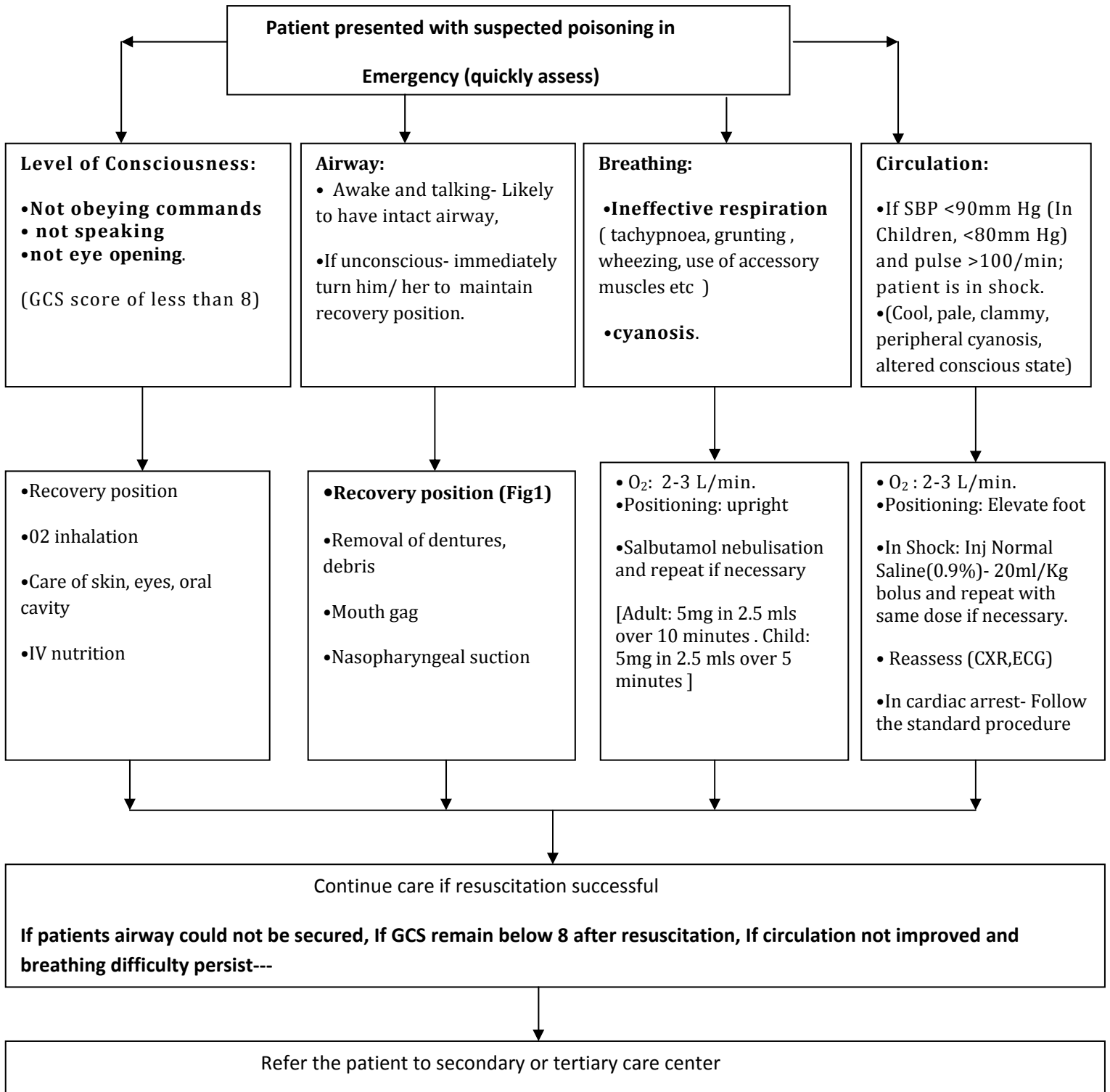
- (1) General management of all forms of acute poisoning,
- (2) Specific management of OP poisoning and
- (3) Specific measures to be taken in other poisoning (non- OP compounds).

General management of all forms of acute poisoning

Level of Consciousness, Airway, Breathing and Circulation should be assessed in all patients with acute poisoning.

Recovery Position: The head, neck and body should be in a straight line so that the tongue will not block the throat, and vomit or saliva can come out of the mouth. Turn the patient's face towards you, and tilt it back, with the jaw jutting forward. Take the patient's upper arm and place the hand under the face. Place the patient's other arm across the chest. Now position the upper leg so that the bent knee rests on the ground and supports the patient's body and lower leg keep straight (Fig: 1).





Flow Chart 1: Immediate assessment and actions at emergency or hospitalized patient. Failure to resuscitate indicates referral to higher centre.

Decontamination:

If patient presented in stable condition or If patient is resuscitated completely and the duration of poisoning is within one hour of incidence, then gastric decontamination should be tried if indicated. Then a syndromic approach should be followed to diagnose poisoning cases.

If the poison is **Swallowed** : A sip of water to wash out their mouth.

If the poison is **Inhaled** : Immediately get the person to fresh air. Avoid breathing fumes.

If the poison enters the **Eye** : Flood the eye with saline or cold water from a running tap or jug..

If the poison contacts the **Skin** : Remove contaminated clothing. Wash with soap and water and rinse well.

Injection/Bites and Stings – Remove clothing. Do not excise and apply suction to bites/stings/ Constricting band

Treatment	Indications
Gastric lavage	<ul style="list-style-type: none">•Should not be routine unless a patient has ingested a potentially life-threatening amount of a poison• Can be undertaken within 60 minutes of ingestion.• Contraindicated if the airway remains compromised.• Don't use wide bored tube for stomach wash; rather use a nasogastric (NG) tube for aspiration with plain water.• A lavage is contraindicated following ingestion of strong caustics or corrosives, non-toxic agents and volatile hydrocarbons(e.g kerosene, turpene etc)
Activated charcoal	<ul style="list-style-type: none">•May be considered if a patient has ingested a potentially toxic amount of a poison (known to be absorbed by charcoal) up to 1 hour of ingestion.

Gastric lavage procedure: The 'golden hour' concept of gut decontamination

- (1) Get informed consent from the patient or a relative.
- (2) For drowsy patients, protect the airway in recovery position and raised foot end 20 cm
- (3) Lubricate and pass down the NG tube orally after measuring the distance ; a mouth gag can be used to prevent patient from biting on the tube
- (4) Confirm the correct placement of the tube in the stomach by aspirating fluid out or injecting air with the 50 mL syringe, while auscultating over the epigastrium
- (5) Siphon off the gastric contents before lavage and save a specimen for toxicological analysis if necessary
- (6) Small aliquots of lavage fluid should be repeatedly introduced by gravity ; the recommended volume of each aliquot is 200 mL for adults and 10 mL/kg for children
- (7) The lavage can be stopped when a total of 3 L of lavage fluid is used and the return is clear
- (8) **Collect the first 50 ml of lavage fluid for toxicological analysis or medico legal purpose.**

Clinical features: If the patient is in an altered sensorium and the diagnosis is in doubt, exclude the other causes of alteration in the level of consciousness, e.g. meningitis, encephalitis, subarachnoid haemorrhage, cerebrovascular accident, metabolic conditions (ketoacidosis, hypoglycaemia, hyponatraemia. etc.), uraemia and hepatic failure, In such situations, try to exclude these conditions by eliciting a detailed history.

From patient or witness history regarding poisoning is crucial: What was the poison involved?; How much poison was taken?; When was it taken?; By what route was it taken?; Why was it taken?; What else was taken along with the poison?; What are the drugs/chemicals available at home?; What is the occupation of the patient

Common clusters of features that may be diagnostic:

Feature cluster	Likely Poison
Coma, hypotension, hypothermia, shallow breathing, hypotonia, hypo-reflexia, fast pulse, watering eyes, yawning, cramps, hallucinations, restlessness, diarrhea.	Barbiturates, benzodiazepines (travel related) and alcohol combinations, severe TCA poisoning.
Smell of OPC, bronchorrhea, bradycardia, hypotension, incontinence of urine & stool, miosis and hyper salivation.	Organophosphorus , carbamate insecticides, some kind of mushroom, nerve agents.
small pupils, slow breathing, unconsciousness, weak pulse low temperature, vomiting	Opioids.
Nausea, vomiting, tinnitus, deafness, sweating, hyperventilation, vasodilatation, metabolic acidosis.	Salicylate (aspirin)
Restlessness, agitation, mydriasis, anxiety, tremor, tachycardia, convulsion, arrhythmias, hyperthermia, hallucinations, fits, sweating, flushed skin, confusion	Sympathomimetic drugs, Amphetamine, Cocaine, Bronchodilator (Theophylline)
dry, hot skin, fever, thirst, dry mouth, large pupils, fast pulse, difficulty in passing urine, hallucinations, fits, shallow breathing unconsciousness	Atropine, Amitriptyline, Antihistamines, Datura stramonium, some kinds of Mushrooms
Blindness (usually with other features)	Quinine, methanol

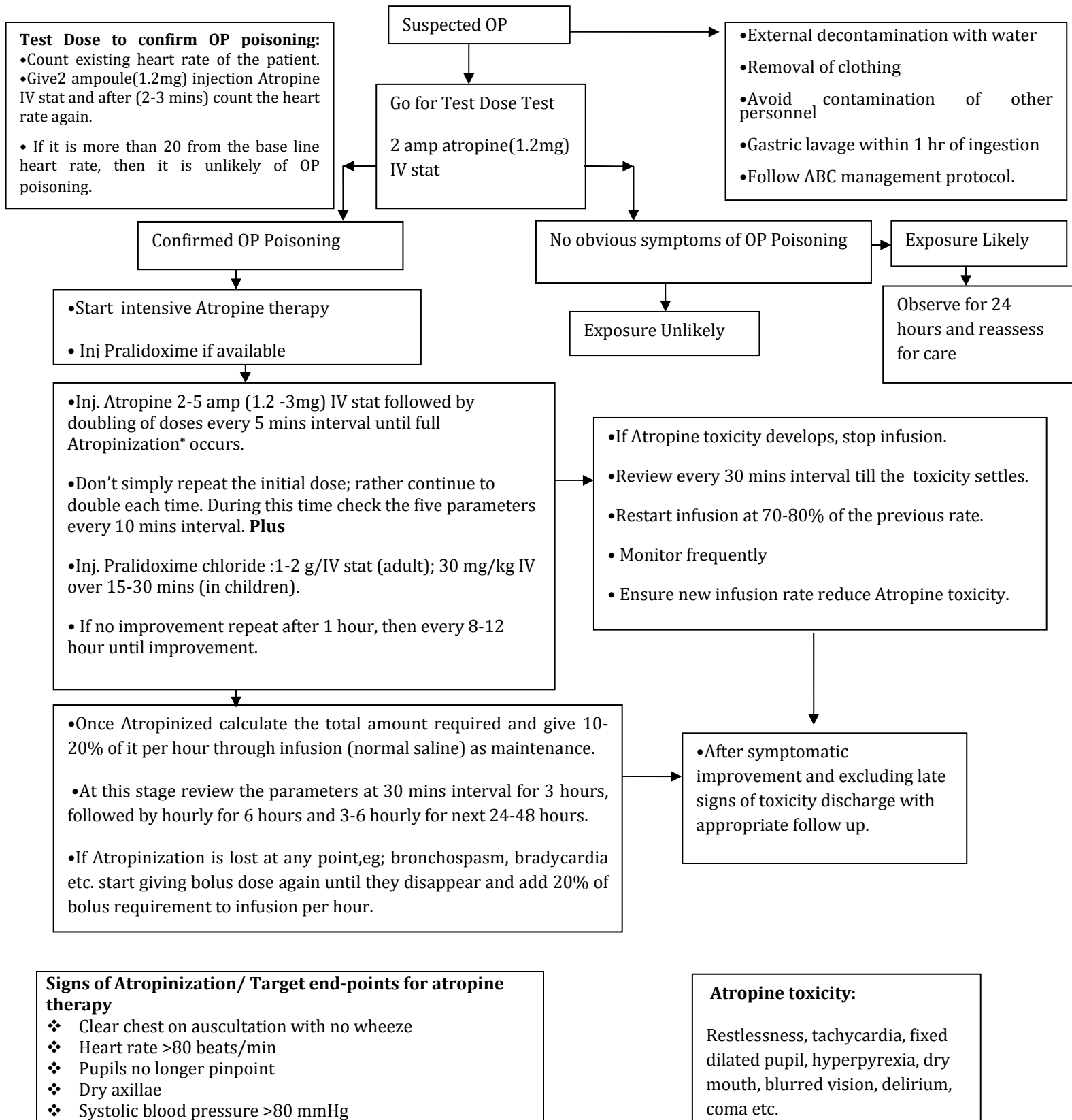
NB: All the features of a particular poison may not be present in a particular case.

Sample of used offending agents or preferably container of pesticide/agents as measure of identification is very important in clinical setting. All patients and their attendants should be repeatedly encouraged to bring the sample to the health facility for diagnosis and management.

- Do in Poisoning**
1. Remove all contaminated cloths and wash the contaminated body with plain water particularly in OP poisoning.
 2. Always maintain recovery position in unconscious patient with any poisoning.
 3. Always follow National Poisoning Management Guideline in any confusion.

- Don't in Poisoning**
1. Do not give stomach wash/ gastric lavage with wide bore tube.
 2. No emesis and No forced diuresis (except salicylate and amphetamine)
 3. No whole bowel irrigation exception iron, lead, zinc and packets of illicit drugs.
 4. Never use Steroid or Antibiotic (except in aspiration pneumonia)
 5. Do not give cathertics
 6. Never give anything by mouth to an unconscious patient.

ALGORITHM: MANAGEMENT OF ORGANOPHOSPHATE POISONING



For Non-OP poisonings use specific antidote after ABC management following **National Poisoning Management Guideline** or standard Text book or with consultations with experts. List of specific antidotes and general care that can be given in certain poisoning cases are given below:

Poison	Antidote
Aluminium Phosphide (Local name: Kari/Gas tab)	<ul style="list-style-type: none"> • Perform gastric lavage. Use, if available, 1:5000 potassium permanganate solution or 2% sodium bicarbonate solution. • Maintain fluid balance and give Sodium bi carbonate to correct acidosis. • Correct shock with adequate fluid. If hypotension does not respond to adequate IV fluids, raise the foot end of the bed. Give dopamine. • If still no response, give hydrocortisone 400 mg IV 4 hourly or dexamethasone 4 mg IV 4 hourly. Give vitamin K1 (phytomenadione) 10 mg IV daily, if prothrombin time is prolonged.
Benzodiazepines except Clonazepam (e.g Sleeping pill,)	<ul style="list-style-type: none"> • Rarely need antidote. If patient developed resp difficulty or persistent deterioration of consciousness, then • Flumazenil(2 mg of flumazenil within 5 to 10 minutes. Adult Dose: 0.1-0.2 mg IV q1min to a total dose of 1 mg at one time or 3 mg in 1 h; infusion rates of 0.1 mg/min decrease disconcerting rapid arousal. Pediatric Dose: 0.002-0.02 mg/kg IV q1min.
Carbon monoxide	100% oxygen
Copper Sulphate (local name—Tute)	<ul style="list-style-type: none"> • D-Penicillamine (Oral): Adult dose: 1000 to 1500 mg/day divided every six to 12h, before meals. For Pediatrics: Initially 10 mg/kg/day gradually increase to 30 mg/kg/day divided in two or three doses as tolerated. Doses up to 100 mg/kg/day in four divided doses can be given. • BAL/ Dimercaprol: Dose: 3 to 5 mg/kg/dose deep intramuscularly every four hours for two days, every four to six hours for an additional two days, then every four to 12h for seven days.
Coumarins / Rat killer	<ul style="list-style-type: none"> • Vitamin K1; fresh frozen plasma. Dose: 10 mg I/M daily until normalization of prothombin time.
Methanol(spirit, adulterated alcohol)and ethylene alcohol	<ul style="list-style-type: none"> • Ethanol [give arrack (Gin, or whisky) 1.8 ml/kg as a loading dose, and 0.2 ml/kg/hr as maintenance dose orally for 3-4 days, after diluted with water or fruit juice] • Fomepizole (if available)
Opioids	<ul style="list-style-type: none"> • Naloxone Adult dose 0.4mg, can be repeated at intervals of 2-3 minutes to a maximum of 10mg. (Naloxon ampoule, 0.4mg/ml).
Paracetamol	<ul style="list-style-type: none"> • N-acetylcysteine : I/V: Adult: 150 mg/kg IV in 200 ml of 5% dextrose over 15 minutes, followed by 50 mg/kg IV in 500 ml dextrose over 4 hours, followed by 100 mg/kg IV in 1000 ml 5% dextrose over 16 hours. • Children (less than 20 kg): 150 mg/kg IV in 3 ml/kg of 5% dextrose over 15 minutes, followed by 50 mg/kg IV in 7 ml/kg of 5% dextrose over 4 hours, followed by 100 mg/kg IV in 14 ml/kg of 5% dextrose over 16 hours. If IV unavailable, • Oral : give 140 mg/kg as a loading dose, followed 4 hours later with 70 mg/kg given every four hours for an additional 17 doses.
Snake venom	<ul style="list-style-type: none"> • Antivenom for Cobra, Krait , Russell’s viper. (Dose: Each dose consists of 10 vials of polyvalent antivenom irrespective of age and sex of the victim. • Each vial is diluted with 10ml. of distilled water. 10 such vials (100 ml) is further diluted or mixed with 100 ml of fluid (Dextrose water or saline). Then it is administered as intravenous infusion within 40-60 min (60-70 drops/min).
Tricyclic antidepressants	<ul style="list-style-type: none"> • NAHCO3. Adult: 1-2 mEq/kg bolus IV; then IV drip of 3 amps of sodium bicarbonate in 1 L of D5W
Household Products	<ul style="list-style-type: none"> • Antidotes are not available. Most cases need supportive care only.