

Forensic Toxicology: General Consideration

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Introduction

Forensic Toxicology is a branch of Forensic Medicine dealing with Medical and Legal aspects of the harmful effects of chemicals on human beings. Below given are described the general considerations of Forensic Toxicology useful for Undergraduate and Post-Graduate Student of Forensic Medicine.

Poisoning in India: Suicidal (KCN, HCL, Opium, Barbiturates, organophosphorus, oxalic acid oleander etc), homicidal(arsenic, aconite, thallium, oleander, madar, carbamates, organophosphorus etc.) and accidental poisoning are seen in India. Older poisons like opium and arsenic are replaced by newer poisons. Common homicidal poisons are: Arsenic, Antimony, Oleander, Nux-Vomica, Madar, powdered glass and aconite. **Cattle Poisoning** is also common, the poison used are Arsenic, Abrus precatorius, Yellow oleander, zinc phosphide, nitrates, aconite etc.

Important Definitions:

Toxicology is the science dealing with properties, action, toxicity, fatal dose, detection estimation of, interpretation of the result of toxicological analysis and management of Poisons.

Poison: A Poison is defined as any substance which when administered in living body through any route (Inhalation, Ingestion, surface absorption etc) will produce ill-health or death by its action which is due to its physical chemical or physiological properties. Eg: alphase, sulphuric acid, arsenic etc.

Drug (WHO 1996): "Drug is any substance or product that is used or intended to be used to modify or explore physiological systems or pathological states for the benefit of the recipient." Eg: paracetamol, ciprofloxacin, salbutamol, oestrogen, insulin etc.

Clinical Toxicology: Deals with human diseases caused by, or associated with abnormal exposure to chemical substances.

Toxinology refers to toxins produced by living organism which are dangerous to man, eg: snake venom, fungal and bacterial toxins etc.

Chelating Agents: are the substances which act on absorbed metallic poisons. They have greater affinity for metals as compared to endogenous enzymes. The complex of agent and metal is more water soluble than metal itself, resulting in higher renal excretion of the complex. E.g.: British anti-lewisite (B.A.L., dimercaprol), E.D.T.A. (ethylene diamine-acetic acid), Penicillamine (Cuprimine), Desferroxamine etc.

Ecotoxicology: It is concerned with the toxic effects of chemical and physical agents on living organisms, especially in population and communities within defined population.

Acute poisoning is caused by an excessive single dose, or several dose of a poison taken over a short interval of time.

Chronic Poisoning is caused by smaller doses over a period of time, resulting in gradual worsening. eg: arsenic, phosphorus, antimony and opium.

Subacute poisoning shows features of both acute and chronic poisoning.

Fulminant poisoning is produced by a massive dose. In this death occur rapidly, sometimes without preceding symptoms.

Parasuicide (attempted suicide or pseudicide) is a conscious often impulsive, manipulative act, undertaken to get rid of an intolerable situation.

Culpable Homicide: Sec 299 IPC; Causing death of a person by an act, with the intention of causing such bodily injury and is likely to cause death, or with the knowledge that he is likely, by such an act to cause death.

Antidote: Antidotes are substances which counteract the effect of poison. They are divided into Mechanical, Chemical, Physiological and specific receptor antagonists.

Laws in relation to poison and drugs: Different sections of Indian penal code related to poisons are as follows

Sec. 272 I.P.C. - Punishment for adulterating food or drink intended for sale, so as to make the same noxious, may extend upto 6 months imprisonment of either term and/or fine upto one thousand rupees.

Sec. 273 I.P.C. - Punishment for selling noxious food or drink may be imprisonment of either description for a period of 6 months and or fine upto one thousand rupees.

Sec. 274 I.P.C. - Punishment for adulteration of drugs in any form with any change in its effect knowing that it will be sold and used as un-adulterated drug, may be imprisonment of either description for a period-of 6 months and or fine.

Sec. 275 I.P.C. - Punishment for knowingly selling adulterated drugs with less efficacy or altered action serving it for use as unadulterated may be imprisonment of either description for 6 months and or fine.

Sec. 276 I.P.C. - Punishment for selling a drug as a different drug or Preparation, may be imprisonment of either description which may extend upto 6 months and or fine. .

Note - In the State of West Bengal, the punishment for these offences described under sections 272 to 276 may be upto imprisonment for life with or without fine.

Sec. 277 I.P.C. - Punishment for fouling water of public spring or reservoir may be imprisonment of either description which may extend up to a period of 3 months and or fine.

Sec. 278 I.P.C. - Punishment for voluntarily making atmosphere noxious to health is fine which may extend upto five hundred rupees.

Sec. 284 I.P.C. Punishment for negligent conduct with respect to poisonous substance may be imprisonment of either description which may extend upto 6 months and or fine which may extend upto one thousand rupees.

Sec. 328 I.P.C. :Punishment' for causing hurt by means of poison or any stupefying, intoxicating or unwholesome drug or any other thing with the intent to commit an offence shall be imprisonment of either description for a term which may extend to ten years with or without fine.

Sources of Poison:

1. **Domestic or household sources** - In domestic environment poisoning may more commonly occur from detergents, disinfectants, cleaning agents, antiseptics, insecticides, rodenticides etc.
2. **Agricultural and horticultural sources**- different insecticides, pesticides, fungicides and weed killers.
3. **Industrial sources**- In factories, where poisons are manufactured or poisons are produced as by products.
4. **Commercial sources**- From store-houses, distribution centers and selling shops.
5. **From uses as drugs and medicines** – Due to wrong medication, overmedication and abuse of drugs.
6. **Food and drink** – contamination in way of use of preservatives of food grains or other food material, additives like colouring and odouring agents or other ways of accidental contamination of food and drink.
7. **Miscellaneous sources**- snakes bite poisoning, city smoke, sewer gas poisoning etc.

Classification of poisons

1. According to the site and mode of action

(A). Local Action

Corrosive

Strong Acid: mineral acid and organic acid

Strong alkali

Metallic: Mercuric Chloride

Irritant

Mechanical: Glass Powder

Chemical

Inorganic: weak acid, weak alkalies, Inorganic non-metals, Inorganic

Metals.

Organic: Chemical preparations, Animal and vegetable origin

(B) Remote Action

Neurotics

- C.N.S. Poisons

i. Somniferous: opium and its alkaloids, Barbiturates.

ii. Inebriant (Intoxicant): Alcohol, ether, Chloroform.

iii. Stimulant

iv. Deliriant: Datura, Belladonna, Hyocyamus, cannabia indica.

v. Stupefaciant

vi. Hallucinogens

vii. Convulsant:

- Spinal (Convulsant)

i. Strychnos Nux Vomica

- Peripheral Nerves

i. Local Anaesthetics: Cocaine, Procaine.

ii. Relaxants (curare).

Cardiac Poisons

- KCN, NaCN, Digitalis, Aconite, Nicotine, Quinine, Oleander

Asphyxiants: Carbon Dioxide, CO, hydrogen sulphide

Nephrotoxic: Oxalic Acid, Mercury, Cantherides

Hepatotoxic: Phosphorus, Carbon tetrachloride, Chloroform.

Miscellaneous: Food Poisons.

(C). Combined local and remotes action:

Classification of Poison according to motive or nature of use:

1. **Homicidal:** Arsenic, Aconite, Digitalis, Abrus Precatorius, Strychnos nuxvomica.
2. **Suicidal:** Opium, Barbiturate, Organophosphorus, carbolic acid, copper sulphate.
3. **Accidental:** Aspirin, organophosphorus, copper sulphate, snakes bite, Ergot, CO, CO₂, H₂S.
4. **Abortifacient:** Ergot, Quinine, Calotropis, Plumbago.
5. **Stupefying agent:** Dhatura, cannabis, chloral hydrate.
6. **Agents used to cause bodily injury:** Corrosive acids and alkalies.
7. **Cattle Poison:** Abrus precatorius, Calotropis, plumbago.
8. **Used for malingering:** semicarpus anacardium

Ideal Suicidal poison: should be easily available, No bad taste, cause No pain, cheap, highly toxic, tasteless or pleasant taste, capable of being taken with food or drink.

Ideal Homicidal poison: it should be cheap, easily available, colorless tasteless odourless, highly toxic, No residual product left, S/S resembles natural diseases, No antidote, Shows no post-mortem changes capable of being administered with food or drink.

Route of Administration/absorption:

Oral (commonest) eg: alphas, acids,

Inhalation: gas poison

Parenteral (IM, IV, Sub-Cutaneous, Intra-Dermal)

Natural Orifices other than mouth (Nasal, Rectal, Vaginal, Urethral),

Ulcers, wounds and intact skin.

Fate of poison in body: A part of the poison taken orally gets eliminated unabsorbed by means of defecation and vomiting. Before absorption the poison may exert its effects in the G.I. Tract. When absorbed, the poison reaches different parts of the body and organs through circulation. Some poisons reach some tissues easily. Others may not cross some tissue barrier. Cumulative poisons get accumulated in some organs or tissues. A part of poison is eliminated as such through different route of elimination. But major part is detoxified or metabolized in the body and then excreted after exerting its toxic effects on the body. Liver is the main organ to detoxify or metabolize most of the poisons.

Certain poisons like Chloroform, Phosphorus, Nitrates and Acetic acid disappear by evaporation or oxidized or destroyed in the body and no trace of them can be detected in the body of post-mortem is delayed.

Excretion of poisons: Unabsorbed poisons are excreted through faeces and vomitus. Absorbed poisons are excreted mostly by urine. A part of volatile poison is exhaled out. Some portion of poison is excreted through bile, saliva, milk, sweat, tear, hair and nails.

Factors influencing the actions of a poison in the body.

1. **Quantity:** A high dose of poison acts quickly and often resulting in fatal consequences. A moderate dose causes acute poisoning. A low dose may have sub-clinical effects and causes chronic poisoning on repeated exposure. Very large dose of Arsenic may produce death by shock without dose irritant symptoms, While smaller dose than lethal dose produces its therapeutic effects.
2. **Physical form:** Gaseous or volatile poisons are very quickly absorbed and are thus most rapidly effective. Liquid poisons are more rapid than solid poisons. Some poisonous vegetable seeds may pass through the intestinal canal ineffective when taken intact due to their impermeable pericarp. But when taken crushed, they may be rapidly fatal.
3. **Chemical form:** Chemically pure arsenic and mercury are not poisonous because these are insoluble and are not absorbed. But white arsenic(arsenic oxide) and mercuric chloride are deadly poisonous. Barium sulphide is deadly toxic but barium sulphate is non-toxic.
4. **Concentration (or dilution):** concentrated form of poison are absorbed more rapidly and are also more fatal but there are some exceptions too.
5. **Condition of the stomach:** food content presence of food-stuff acts as diluent of the poison and hence protects the stomach wall. Dilution also delays absorption of poison. Empty stomach absorbs poison most rapidly. In cases of achlorohydia, KCN and NaCN is ineffective due to lack of hydrochloric acid, which is required for the conversion of KCN and NaCN to HCN before absorption.
6. **Route of administration:** absorption rate is different for different routes.
7. **Age:** some poisons are better tolerated in some age groups. Opium and its alkaloids are tolerated better by elderly subjects but badly by children and infants. Belladonna group of drugs are better tolerated by children than by adults.
8. **State of body health:** A well built person with good health can tolerate the action of poison better than a weak person.
9. **Presence of disease:** In certain diseased conditions some drugs are tolerated exceptionally well e.g.: sedatives and tranquilizers are tolerated in very high dose by manic and deliriant patients.
10. **Intoxication and poisoning states** - In certain poisoning cases some drugs are well tolerated, like, in case of strychnine poisoning, barbiturates and sedatives are better tolerated. Whereas in case of barbiturate poisoning any sedative or tranquilizer will accentuate the process of death.
11. **Sleep** - Due to slow metabolic process and depression of other body functions during sleep, usually the absorption and action of the poison is also slow. But depressant drugs may cause, more harm during the state of sleep.
12. **Exercise** - Action of alcohol on C.N.S. is slowed during exercise because more blood is drawn to the muscles during exercise.
13. **Cumulative action of poisons:** Preparations of cumulative poisons (poisons which are not readily excreted from the body and are retained in different organs of the body for a long time) like lead may not cause any toxic effect when enters the body in low dose. But when such poisons enter over a long period of time, may cause harm when their concentration in different tissue reaches high level due to their cumulative property.
14. **Tolerance** may develop by individuals on long term exposure to a particular poison.
15. **Idiosyncrasy:** some persons may react adversely to a particular drug though the general population tolerates the drug well.

Signs and symptoms:

The signs and symptoms may be different for different poisons and is responsible on the nature and action of the poison. They can be local, remote or combined and are will be taught in the individual poisons.

Diagnosis of poisoning

In the Living

1. **History of the case** as stated by the patient himself and his/her relatives or friend. Full information about time of onset of the present illness, Initial symptoms, progress, relation with food, condition of other persons taking same food or drink, possible source, any previous history of poisoning, H/o depression, quarrel. Also note down the color, smell, consistency, taste and quantity of the possible poisonous substance.
2. Signs and symptoms.
3. Details of examination.
4. Preservation and laboratory investigation of vomitus, excreta, stomach wash, scraps from any stains area on the body, blood, stained part of the clothes, contents of a doubtful container, left over ant part of food or drink.

In the Dead:

1. **History** of the case as stated by police or relatives. H/o 2 or more vital points (1 how long the victim survived after initial symptoms. 2. any treatment).
2. **Post-mortem Examination** (external and internal)
3. **Chemical Analysis:** detection of poison in the body fluids.
4. **Preservation of viscera** and other material for lab. Examination.

Postmortem Findings in Case Of Death Due To Suspected Poisoning

External Examination

1. **Postmortem staining:** Deep blue - In case of asphyxiant poisons and aniline. Bright red or cherry red - In case of CO and HCN poisoning.
2. **Deep cyanosis** - With opium and cardiac poisons.
3. **Early rigor mortis** - With strychnine.
4. **Early appearance of the sign of decomposition** - With H₂S gas.
5. **Detectable smell** - In case of volatile poisons, opium and HCN, KCN or NaCN.
6. **Haemorrhagic spots** under the skin and mucus membrane: Phosphorus.
7. **Ulceration on lips** and near the angles of mouth - Corrosive poisons.
8. **Stain near mouth** and on hands - Nitric acid and copper sulphate.
9. **White froth from mouth and nose** - Opium and its alkaloids.
10. **Blood tinged froth from mouth and nose** Organophosphorus compounds.
11. Alopecia, hyperpigmentation and hyperkeratosis - Arsenic poisoning over a long period.
12. Staining, erosion and ulceration near the female external genitalia - Use of abortifacient agents or torturing agents.
13. Injection marks - Injection of poisons (snake bite or otherwise), sign of treatment.

Internal findings: The G.I.T. should be examined very carefully since signs of corrosive or irritant poisons are likely to be found therein. These signs are Hyperemia, softening, ulceration and perforation. Apart from this below given is a brief note of internal finding in cases of poisoning.

1. Corrosion, ulceration and desquamation of inner aspects of lips, mucus membrane of mouth and tongue - **Corrosive agents**.
2. Soft, swollen, sodden, translucent, bleached tongue and mucus membrane of mouth-Corrosive alkali
3. Hardening of mucus membrane - **Phenol**
4. Phenol Yellowish discoloration - **Nitric acid**
5. Bluish discolouration - **Copper sulphate**
6. Carbonization and charring- **Conc. Sulphuric acid**
7. Chalky appearance and consistency of teeth -:**Sulphuric acid**

8. Blue lining in the gum - **Chronic lead poisoning**
9. Swollen gum, loose teeth, foetid smell - Acute mercuric chloride poisoning; chronic phosphorus poisoning
10. Corrosion, irritation, desquamation and haemorrhage in the inner wall of the esophagus - **Corrosive and irritant poisons**
11. Hardening and whitish discolouration – In case of Carbolic acid poisoning
12. Discoloration and staining of inner aspects of mouth - With coloured poisons
- 13. Oesophageal stricture** - A complication of sulphuric acid ingestion

14. Stomach

- (a) Thickening and softening of the wall -Corrosive and irritant poisons
- (b) Hard wall- Carbolic acid
- (c) - Hard and leathery wall- Formaldehyde
- (d) Hyperemia haemorrhage and desquamation of mucus membrane Irritant poison
- (e) Laceration and sloughing – Corrosive poison
- (f) Perforation - H₂SO₄ and HN₃
- (g) Yellowish discolouration of mucus membrane - HNO₃; Bluish - CuSO₄; Slaty grey - HgCl₃
- (h) **Stomach content** - Blood - Corrosive and irritant; Yellowish – HNO₃ Bluish - CuSO₄ Luminous in dark - Phosphorus; Detectable tablet - soneryl; Powder oxalic acid, white arsenic; Detectable smell - kerosene, alcohol, chloroform, organophosphorus compounds, chlorinated hydrocarbons, opium, cyanogen, formaldehyde, phosphorus; Detectable liquid - kerosene.

15. Small intestine - May show irruption, sometimes may show presence of poisonous remains.

16. Large intestine - May show ulcerations, as in case of HgCl₃ similar in appearance of ulcers of bacillary dysentery. It particularly involves the ascending and transverse colons.

17. Liver - Different degenerative changes occur in cases of poisoning with poisons like phosphorus, carbon tetra-chloride, chloroform, tetrachlorethylene and many other poisons. The type and extent of the degenerative changes occur depending on the type of poison, dose, duration of the exposure and physical condition of the patient.

18. Kidneys - Swollen, reddish, soft, sometime greasy in touch with haemorrhage in calyces and other degenerative changes - cases of poisoning with mercury, oxalic and carbolic acid, phosphorus, cantherides, viper snake venom and many others. In case oxalic acid poisoning, white powder of oxalate crystals are present in the tubules and the calyces .

19. Urinary bladder - Haemorrhage in cases of abrus precatorius, viper snake bite em, cantheride poisoning.

20. Larynx and trachea - Hyperaemic, inflamed -In cases of inhalation of irritating gases leaking of corrosive agents while ingestion vomiting; froth in the lumen of trachea and larynx in case of opium and organo:phosphorus poisoning.

21. Chest cavity -Smell of volatile poisons cyanogen, opium etc. can be detected.

22. Lungs - Voluminous, congested, presence of Tardieu's spots - In case of asphyxiants and inhaled poisons. Cut section gives blood stained frothy-fluid in case of opium and other asphyxiants.

23. Heart- Presence of subendocardial haemorrhagic spots in cases of arsenic, phosphorus, mercuric chloride etc.

24. Brain and spinal cord - Congestion and edema of brain and spinal cord in cases of cerebral and spinal poison (e.g. strychnine: respectively. Brain – may be congested. oedematous with occasional haemorrhagic points at places in cases of asphyxiant poisons.

25. Uterus and vagina - Staining, congestion haemorrhage, ulceration in cases of attempted abortion by use of local abortifacient agents.

Preservation of viscera and other materials

In all cases of poisoning

1. Stomach with its full contents.
2. Half of Liver or 500 gms whichever is more.
3. A loop of small intestine.
4. Half of each kidney.
5. Some portion of spleen

In some particular poisons

1. Blood 100ml: in cases of absorbed poisons.
2. Urine 100ml in all cases where blood is preserved.
3. Part of both lungs in cases of Volatile poisons.
4. Heart in case of cardiac poisons.
5. Brain in cerebral poisons.
6. Spinal in spinal poisons.
7. Bones in arsenic and lead.
8. Hair in arsenic and copper.
9. Nails in arsenic.
10. Skin-scrap from areas stained with a suspected poison.
11. Stained areas of dress, suspected packet of poison, strips of tablets recovered from pocket.

Preservative used

For Viscera: absolute alcohol or rectified spirit. Exception: alcohol, chloroform, chloral hydrate, formaldehyde, ether, phosphorus (alcohol prevents the luminosity of phosphorus in dark) etc.

Blood should be preserved in fluoride, oxalate, E.D.T.A., gold chloride or citrate

Urine and clothes: without any preservative.

Management of a case of poisoning

Immediate resuscitative (Basic Management) measures in comatose patient should be adopted to stabilize respiration, circulation and the correct CNS depression.

- A) **Airway:** opening up and cleaning the airways (oral cavity, Nostrils) of secretions, vomit or any foreign body. Pull tongue forward
- B) **Breathing:** Supplemental oxygen therapy should be administered
- C) **Circulation:** I.V. fluid administration
- D) **Depression** of CNS should be corrected

Specific Management

1. **Removal of patient** from source of exposure: Patient should be removed away from the source of poison as quickly as possible.
2. **Removal of the unabsorbed poison.** In case of contact poison washing of affected area with soap water with gentle rubbing will be helpful. In cases of ingested poisons Gastric lavage is useful within 3 hours of ingestion and is done by stomach tube(Ewald or Boas tube) or by Ryle's tube followed by emesis (physical or by drugs like Ipecacuanha 1-2 gm, mustard oil 1 Tsf in a glass of water, concentrated salt solution 6%, Zinc Sulfate 1-2gm in water, apomorphine hcl 1-2ml o 3 mg /ml). In case of injected poison ligature is applied above the wound. In cases of inhaled poison the patient should be immediately removed to fresh air.
3. **Diluting the poison** and delaying the absorption by water or food.
4. **Elimination of absorbed poison** by increases urination (diuresis), increased perspiration (diaphoresis), Dialysis, use of chelating agents.
5. **Use of specific antidote**
6. **Symptomatic treatment** including safeguarding respiration and maintenance of circulation.

Counterindications of gastric lavage with stomach tube:

1. In corrosive poisons.
2. Convulsant poisons.
3. Unconscious or semi-conscious patients
4. In infants and children: Ryle's tube or infant feeding tube is used.

Antidote: Antidotes are substances which counteract the effect of poison. They are divided into Mechanical, Chemical, Physiological and specific receptor antagonists.

Physical or mechanical antidote prevents the action of poison mechanically, without destroying or inactivating the damaging actions of the poisons. Eg: adsorbents like activated charcoal, Demulcents like egg albumin, starch or milk, Diluents like water or milk, bulky food like boiled rice or vegetables.

Chemical antidotes are substances which disintegrate and inactivate poisons by undergoing chemical reaction with them. Eg: Weak acids and alkali, common salt, egg albumin, $KMnO_4$.

Physiological antidote have their own action producing signs and symptoms opposite to that produced by the poison.

Eg: Naloxone for morphine, Neostigmine for datura or hyoscin group, Barbiturate for strychnine.

Serological Antidote: Anti-snake venom serum for snake bites poisoning.

Universal Antidote: It is a combination of physical and chemical antidotes. When the exact nature of poison is not known then universal antidote is used which acts against a wide range of poisons.

Constituents

Activated charcoal 2 parts

Magnesium oxide 1 part

Tannic acid 1 part

Dose 1TSP (15gms) in a glass water (can be repeated)

Activated charcoal for its adsorbent action, Magnesium oxide neutralizes acids poisons, tannic acid precipitates alkaloids.

Household antidotes:

1. Strong liquid **tea** (contains tannic acid) precipitate alkaloid and metallic poisons.
2. Starch for iodine.
3. Milk and raw egg for mercury, arsenic, heavy metal.
4. Flour suspension and mashed potatoes can be used in place of activated charcoal.
5. Milk of magnesia or soap solution for acid poisoning.
6. Orange, lemon juice or vinegar for alkali poisoning.

Chelating agents are the substances which act on absorbed metallic poisons. They have greater affinity for metals as compared to endogenous enzymes. The complex of agent and metal is more water soluble than metal itself, resulting in higher renal excretion of the complex. Eg: British anti-lewisite (B.A.L., dimercaprol), E.D.T.A. (ethylene diamine acetic acid), Penicillamine (Cuprimine), Desferroxamine etc.

B.A.L. (British Anti-Lewisite, 2-3 dimercaptopropanol) has 2 unsaturated SH radicals which combines with metal in circulation, thus tissue enzymes are spared. Useful in cases of Arsenic, mercury, copper, bismuth, gold etc

Dose: 3-4 mg/kg BW as a preparation of 10% with 20% Benzyl benzoate in arachis oil given deep intra-muscular (may cause embolism on I.V. inj.) 4 hourly for first 2 days followed by twice daily for 10 days

E.D.T.A. (Ethylene diamine tetra-acetic acid) it combines with sodium to form sodium salt and then with calcium to form disodium calcium edentate which combines with free metal and inactivates it biologically. It is best chelate for lead. Dose for adults 1gm twice daily at 12 hour interval slow I.V. Injection mixed with 5% glucose saline.

Penicillamine: It has stable SH radical which combines with free metal. Dose 30mg/Kg BW/Day in 4 divide doses for 7 days.

Desferrioxamine: It is specific antidote for iron. Dose 8-12 gm orally. For absorbed iron 2gm I.V. with 50% laevulose solution.

Duties of a Registered Medical Practitioner in connection with poisoning cases :

(a) Try to save the life of the patient and give emergency necessary treatment.

(b) If necessary, the patient should be sent to a better hospital, if possible a government hospital, if the condition of the patients demands and permits the shift.

(c) To take a detailed history of the case as to when and how the symptoms started what is the progress; whether related to taking of any food or drink ; whether the number of sufferer is more than one whether any treatment was already given and whether there is any history of previous poisoning.

(d) The doctor should himself record full history of the case, the signs and symptoms and progress.

(e) The doctor should collect and preserve the vomitus, stool, urine, clothes stained with poison or vomitus, doubtful container with remaining part of the poison, if any, and if necessary blood, for laboratory investigations.

(f) The doctor should arrange for a reliable attendant of his own choice, for _ patient.

(g) The doctor should. inform the police station of the area about the case irrespective of whether the patient survives or dies and whether it appears to be a case of suicide or homicide or accident.

(h) If death is apprehended then arrangement for recording dying declaration should be made.

(i) In case of death, death certificate should mention about the poisoning or suspected poisoning with recommendation for post-mortem examination. .

WHO recognized Poison Information Centers in India

Ahmedabad

Poisons Information Centre
National Institute of Occupational Health, Meghani Nagar
Ahmedabad 380 016
Director: Dr A. Dewan
Telephone: +91 79 286 7351
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Information also at <http://www.whoindia.org/> and go to Environment health/Poison Prevention/Helpline

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Note: The above notes and other teaching material are also available on the departmental website www.forensicindia.com