Characteristics of Ideal suicidal poison:

- cheap, easily available
- tasteless or pleasant taste
- mix easily with food materials
- highly toxic and produce painless, quick and sure death

Eg: **opium, barbiturates**

but organophosphorus compounds and endrin are commonly used

Characteristics of Ideal homicidal poison:

- cheap, easily available
- colourless, odourless, tasteless
- capable of being administered with food materials without being detected
- highly toxic
- no antidote should be available
- signs and symptoms should resemble natural disease

- no post mortem changes
- rapidly destroyed in the body
- should not be detected by any test

Eg: thallium and fluorine,
but arsenic and aconite are commonly used

Toxicity rating of poisons

Fatal dose	Toxicity rating
Less than 5 mg/kg	6 – super toxic
5 to 50 mg/kg	5 – extremely toxic
51 to 500 mg/kg	4 – very toxic
501 mg/kg to 5 gm/kg	3 – moderately toxic
5.1 gm/kg to 15 gm/kg	2 – slightly toxic
More than 15 gm/kg	1 – practically non-toxic

Types of presentation of poisoning cases to a Doctor

Fulminant: massive dose

Acute: excessive single dose or several small doses in a short period

Chronic: small doses over a long period

Sub acute: features of both acute and chronic poisoning

Presentation of acute poisoning cases:

- dehydration due to vomiting / diarrhoea
- respiratory / cardiovascular depression
- impairment of consciousness
- convulsions

General management of poisoning:

- Stabilization
- Removal of unabsorbed poison (Decontamination)
- Antidote administration
- Poison elimination
- Nursing and Psychiatric care

Stabilization:

(ABCD of resuscitation)

Airway:

- clean the airway of secretions

Breathing:

- give oxygen, Assisted ventilation

Circulation:

- I.V. fluids, vasopressors

Depression of the CNS:

Removal of Unabsorbed Poison:

Inhaled poisons:

- the patient must be removed into fresh air
- artificial respiration and oxygen (six to eight litres per minute) should be given
- aminophyline
- diuretics
- Nikethamide

Injected poisons:

(poison injected by bite or injection)

- a tight ligature should be applied immediately above the wound, which must be loosened for 1 minute after every 10 minutes

- wound should be excised, poison sucked out

- local vasoconstriction by inj. adrenaline

Skin decontamination:

- washing with water

Eye decontamination:

- normal saline irrigation

Ingested poisons:

G.I.T. decontamination:

- Gastric lavage
- Emesis
- Catharsis
- Whole bowel irrigation
- Activated charcoal

Gastric lavage (stomach wash):

- aspiration of the stomach contents and washing out of the stomach with a solution

Indications:

- ingestion of life threatening amount of poison and presents to the hospital within 3 hours of ingestion

Gastric lavage tube:

Ideal tube for lavage is lavacuator

In india, Ewald tube is commonly used

- soft, non-collapsible rubber tube of 1 cm diameter and 1 ½ metre length, with a funnel attached at one end, and a mark about 50 cm from the other end

In a child, Ryle's tube is sufficient

Suction bulb at the middle of the tube

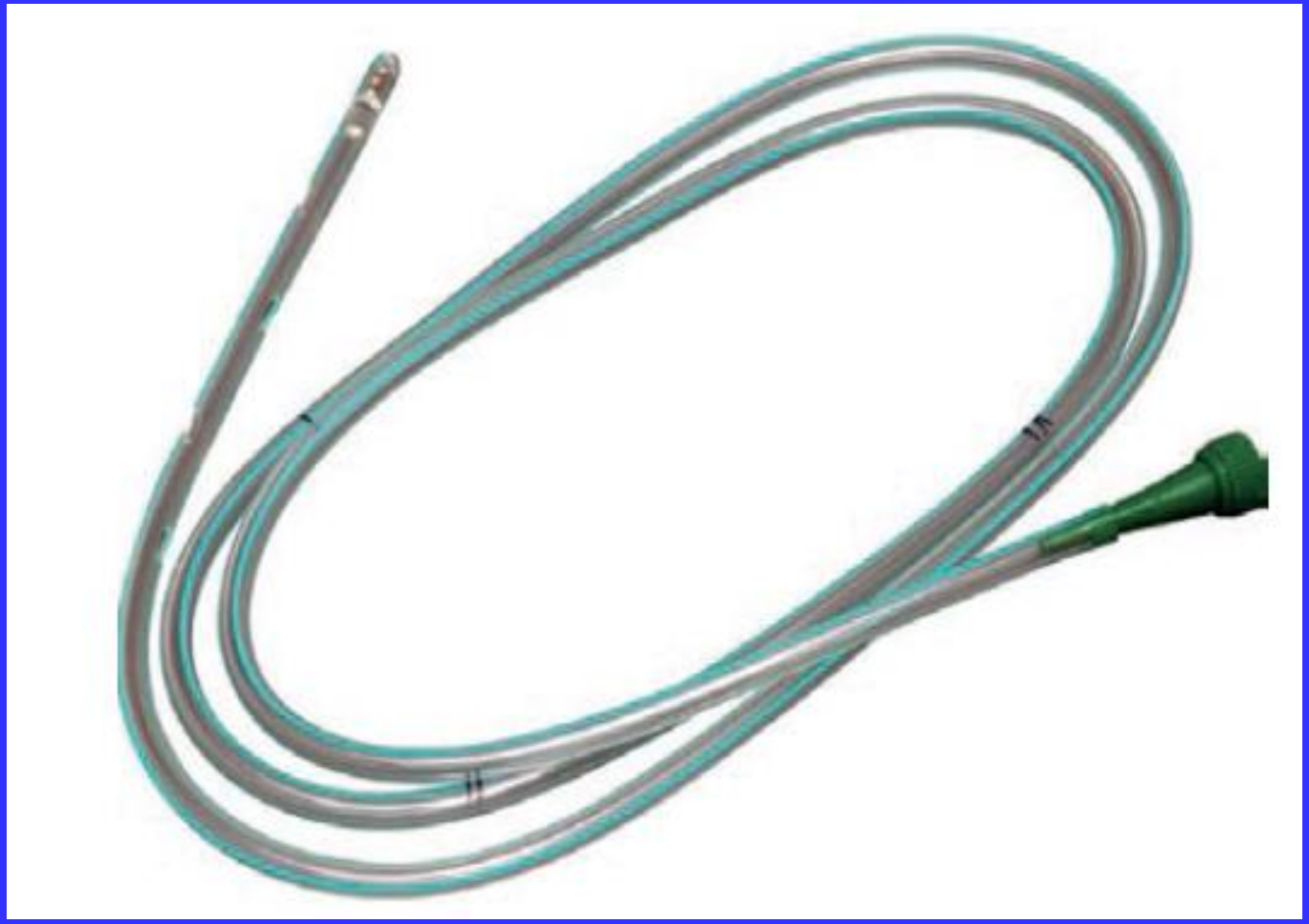
(to pump out the stomach contents)

- A wooden mouth gag with a hole at its mid-part to allow the passage of the tube through it.

Lavacuator tube

EWALD TUBE

RYLE'S TUBE



Procedure:

- consent
- in comatose patient, endotracheal intubation must be done prior to lavage
- preferred route of insertion is oral
- head down, left lateral position (table tilted 20^{o})

(mouth is at a lower level than larynx)

- Dentures must be removed, if present
- mouth gag is placed in between the teeth of two jaws, so that the teeth do not bite the tube
- lubricate the inserting end of the tube with with xylocaine or glycerine

- tube is passed into the stomach by depressing the tongue with tongue depressor, and slowly passing it downwards through the pharynx and oesophagus into the stomach, till the 50 cm mark is reached

- length of the tube to be inserted

(50 cm for adults, 25 cm for children)

After the tube has been inserted, check the position of the tube:

- Testing the pH of the aspirate
- X - ray
- *Absence of coughing and of breath sounds in the funnel will confirm that the tube has not entered into the trachea*

- ¼ litre of water should be passed through the funnel held high up above the patient head

- applying suction on the bulb will siphon the stomach contents

Solutions used for gastric lavage:

Poison	Solution
Most poisons (known or unknown)	Water or saline
Oxidizable poisons (alakaloids, salicylates, etc)	Potassium permanganate (1:5000)
Cyanide	Sodium thiosulphate
Iron	Desferrioxamine

Hold the first aliquot of washing for chemical analysis.

Lavage should be continued till the efferent lavage solution is clear.

Contraindications:

Absolute:

- corrosive poisoning (except carbolic acid poisoning)
- convulsant poisons, volatile poisons
- hypothermia

Relative:

- bleeding diathesis, esophageal varices
- coma

Complications:

- laryngospasm
- aspiration pneumonia
- perforation of stomach or esophagus
- vagal inhibition
- cardiac arrhythmias

EMESIS:

Syrup of ipecacuanha

Active principles: cephaline, emetine

Indications:

- use only when there is difficulty in obtaining or using stomach tube
- patient must be conscious
- with in 4 hours of ingesting poison

Mode of action:

- stimulation of peripheral sensory receptors in G.I.T
- stimulation of CTZ

Dose:

30 ml (adult), 15 ml (children)

followed by 250 – 500 ml of water

Contraindications:

- convulsions, coma, corrosives
- foreign body ingestion
- pregnancy, heart disease, bleeding diathesis

Complications:

- aspiration pneumonia
- esophageal tears
- cardiac arrhythmias

CATHARSIS:

cathartics accelerate defecation.

Ionic or saline:

(poorly absorbed salts → increase osmotic pressure which increases water in intestinal lumen → creates more bulk → activate motility reflexes and enhances expulsion)

Sodium sulphate: 30gm

Magnesium sulphate: 30gm

Magnesium citrate: 4 ml / kg

Saccharides:

Sorbitol: 50 ml of 70% solution

(cathartic of choice in adults)

- must not be used as far as possible in young children owing to risk of fluid and electrolyte imbalance (esp. hypernatraemia)

Contraindications:

- Corrosives
- Existing electrolyte imbalance
- Paralytic ileus
- Severe diarrhoea
- Recent bowel surgery
- Abdominal trauma
- Renal failure

WHOLE BOWEL IRRIGATION:

cleanses the entire bowel

nasogastric administration of large amounts of an osmotically balanced polyethylene glycol electrolyte solution (PEG-ES)

Indications:

- late presenting over dose ingestion
- extended release preparations
- packets of illicit drugs
- poisons difficult to remove: iron, lithium

ACTIVATED CHARCOAL:

- fine, black, odourless powder made from burning wood, coconut shell, rice starch, followed by treatment with activating agent (steam, CO_2, etc) at high temperature.

- The particles have pores that increase the surface area greatly.
- Due to its high degree of microporosity, one gram of activated carbon has a surface area of 1000 square meters.

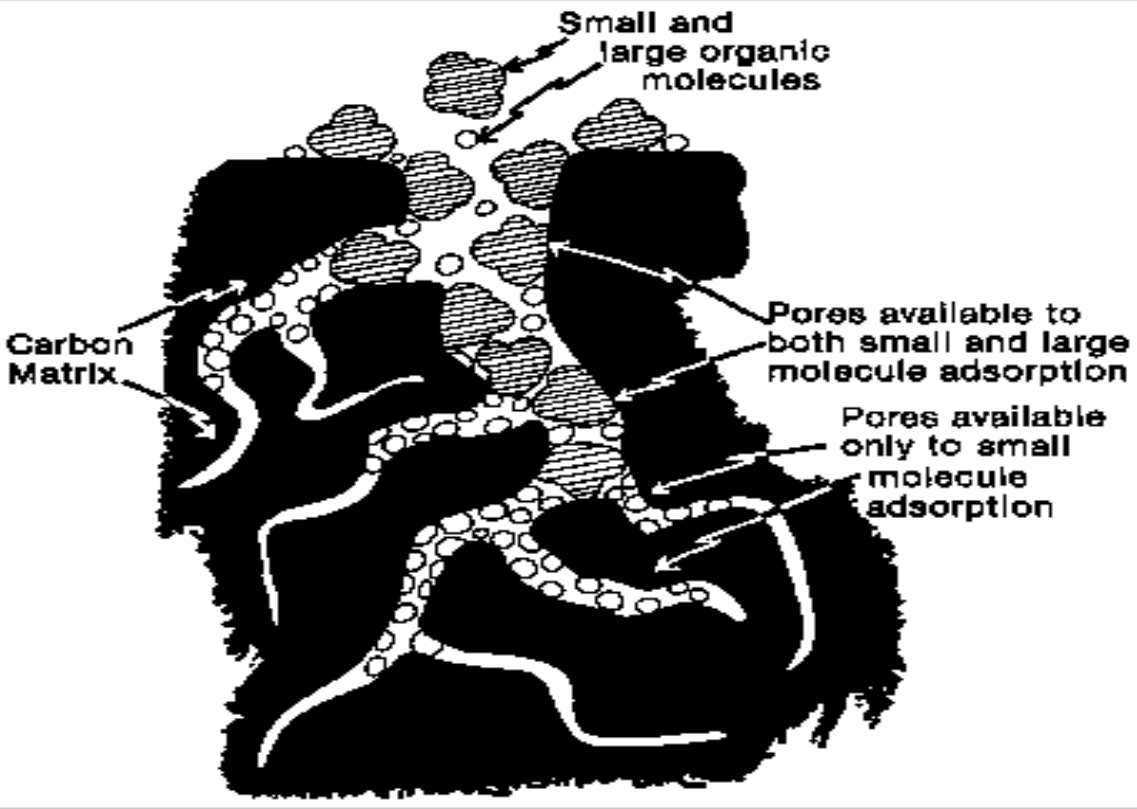
Mode of action:

- acts mechanically by adsorbing and retaining within its pores and thus decreases absorption of poisons from the stomach

Effective against many poisons

Not useful in:

- corrosives, cyanide, hydrocarbons


Small and
large organic
molecules
Carbon
Matrix
Pores available to
both small and large
molecule adsorption
Pores available
only to small
molecule
adsorption

Dose: 1 gm / Kg. bd.wt

Procedure:

- add 4 to 8 times the quantity of water to the calculated dose
- administered to the patient after lavage or emesis or as sole intervention

Disadvantages:

- unpleasant taste, vomiting
- constipation / diarrhea

Contraindications:

- intestinal obstruction