

# Poison

A Poison is a substance which, when administered, inhaled or ingested, is capable of acting deleteriously on the human body.

- Anything is a Poison.
- No Real Boundary between Medicine and Poison.
- Medicine in toxic doses acts as a poison.
- Poison in small/therapeutic doses acts as a medicine.
- In Law the difference is the **INTENT**.
- If the substance is given with the intention to save life, it is a medicine but if it is given with the intention to cause bodily harm/endanger ones life , it is Poison.

# Related Laws

- Drugs and Cosmetics Act, (1940)
- Drugs and Cosmetics Rules, (1945)
- Drug Act, (1976)
- Dangerous Drug Act, (1930)
- Dangerous Rule- 8
- Dangerous Rule- 13
- Dangerous Rule -14
- Narcotic Drugs and Psychotropic Substances Act, (1985)

# Drugs and Cosmetic Act 1940

## **Under this Act**

A cosmetics means any article intended to be rubbed, poured, sprinkled on ,or introduced into, or otherwise applied to human body or any part thereof for cleansing, beautifying, promoting attractiveness or altering the appearance, and includes any article intended for user as a component of cosmetic but does not include soap.

# Aim

- The main aim is to control quality, purity, and strength of drugs.
- Act provides stringent punishment in respect to offenses concerned with drug adulteration.

# Drugs and Cosmetics Rule (1945)

## Under This Rule

- The drugs are classified in certain schedules, and regulations are laid down for their storage, display, sale, dispensing, labeling, prescribing etc.
- Schedule H and L Drugs are required to be labeled with the words “**SCHEDULE H DRUGS**” and “**SCHEDULE L DRUGS**”
- **Warning**-to be sold by the retail on the prescription of a Registered Medical Practitioner only

# Drug Act (1976)

## Objectives:

- Marketed drugs, whether produced locally or imported are of required quantity.
- New drugs are adequately tested and evaluated for both safety and efficacy before their intended use.
- Term of approval of any product can be modified or the product can be withdrawn from use after marketing, on the basis of additional information.
- Medical practitioners are kept fully informed about the properties of the drugs, i.e their desired and undesired effects.
- There is also control over advertising to prevent or discourage misuse by medical profession and public.

# Dangerous Drug Act (1930)

- **Primary objective** is to prevent misuse of drugs having potential for abuse.
- **Abuse of drug** means the drug is taken apart from its medical use.
- **Drugs having potential of misuse**
  1. Coca
  2. Opiates (heroin, morphine, methadone)
  3. Amphetamines
  4. Cannabis and mescaline
- **Dangerous Drugs**



# Dangerous Rule 8

- Deals with mode of sale and supply of '**Dangerous Drugs**'.
- Coca
- Opiates
- Amphetamines
- Cannabis
- Mescaline

**A licensed chemist may sell opium alkaloid or coca derivatives to a medical practitioner known to him subject to the conditions that;**

- Medical practitioner should either sign the register in person or send a written signed order stating his name, registration number, address and the name and quantity of the drugs required
- Licensee shall satisfy himself as to the genuineness of the signatures and qualifications of the medical practitioner
- If the drugs are to be obtained by post, they shall be sent by registered post

- In case of real emergency, the drugs may be supplied on oral message, provided the licensee is satisfied about the genuineness of the order and medical practitioner furnishes or assures to provide written signed order within 24 hours.

**The drug may also be supplied to any person having a prescription subject to the following conditions;**

- Opium alkaloids or coca derivatives shall be sold in such quantity only as may be specified in the prescription
- If the prescription does not bear a superscription, the dangerous drugs shall be sold once only and the prescription shall be retained
- If the prescription bears a superscription, the chemist shall make entries about the amount of drug supplied, date of sale, and shall sign and seal the prescription before returning it to the holder of the prescription

- If it appears from the prescription that dangerous drugs have already been sold six times or such number of times as the prescription is required to be repeated, he shall not sell the dangerous drugs on such a prescription.

# Dangerous Rule 13

- Prescribes limitations about the quantity of the dangerous drugs, which a medical practitioner may possess for use in his practice at any one time.

1. Medicinal hemp..... 3 ounces
2. Medical opium..... ..3 ounces
3. Opium alkaloid derivatives  
(excluding prepared opium)..... 60 grains
4. Coca derivatives..... 60 grains

# Dangerous Rule 14

- Is about maintenance of record of dangerous drugs in separate registers for each drug or in separate parts of the same register assigned to each of the following classes of drug and preparations
  1. Cocaine and preparations containing it.
  2. Medical opium.
  3. Morphine and preparations containing it.
  4. Morphine derivatives and preparations containing them.
  5. Extracts or tinctures on Indian hemp.

# Narcotic Drugs and Psychotropic Substances Act (1985)

## **Under this Act**

- Prohibits cultivation, manufacture, possession, sale, purchase, transport, import, export etc., of these drugs and substances except for medical and scientific purposes as provided in the act.
- Narcotic drugs covered under the act are:
  1. Cannabis (hemp)
  2. Coca leaf
  3. Opium
  4. Any other substance declared by the Government as manufactured drug.



- A **psychotropic substance** means, any substance, natural or synthetic, or any natural material or any salt or preparation of such substance or material specified in the schedule list of 77 psychotropic substances, which include cannabis, amphetamines, tranquillisers, LSD, etc.

# Aim

## **Aim of this Act is to:**

- Control manufacture, storage, distribution, sale, dispensing, and import-export of drugs.
- Penalise people for possession and use of certain drugs.
- Maintain quality of drugs.
- Compel the manufacturers to list dangerous ingredients in patent medicines, and
- Prevent cases of addiction and poisoning.

# Medicolegal Aspects of Poisoning

- 1) Human Poisoning
- 2) Cattle poisoning

# Human Poisoning

The circumstances may be;

- a) Suicidal
- b) Homicidal
- c) Stupefying;or
- d) Accidental

# Suicidal Poisoning

- The poisons used for **suicidal** purposes are; potassium cyanide, hydrocyanic acid, opium, barbiturates, organophosphorus compounds and oleander, etc, according to availability and use in the particular place
- **A suicidal poison of choice** must be cheap, easily available, and capable of being administered in any food or drink
- It must have a pleasant taste and no repulsive smell
- The lethal dose must be small, and the lethal period short and preferably painless

# Homicidal Poisoning

- The poisons used for **homicidal** purposes are;arsenic,antimony,aconite,thallium,organophosphorus compounds,oleander,madar,strychnine,powdered glass,rarely insulin and other drugs,and very rarely cultures of disease germs.Opium is sometimes used to kill children
- **An ideal homicidal poison** should be cheap,easily available,colorless,odourless and tasteless
- It must be capable of being administered in any food drink or drug without arousing suspicion
- The symptoms should resemble any natural disease or serious illness

- The lethal dose should be small and the lethal period sufficiently long to permit the poisoner to escape safely and not to arouse any suspicion thereafter
- There should be no antidote and no possibility of its detection either at autopsy or by laboratory methods

# Stupefying Poisons

- The poisons used for **stupefying** purposes are; alcohol, datura, cannabis indica, and cigarettes containing arsenic, datura or cannabis. Chloral hydrate mixed with drink is similarly used. Rohypnol (Roche) is a new edition.



# Cattle Poisoning

- Cattle poisoning is generally resorted to by **chamars** (cobblers) for sake of hides
- Rarely, cattle are destroyed by owners when they are useless
- The poisons used to **destroy cattle** are; abrus precatorius, arsenic, yellow oleander, and parathion. Sometimes aconite, madar, nux vomica seeds and snake venom are also used.

# Aspirin Poisoning

## Properties

- Aspirin(acetylsalicylic acid) is a white crystalline powder with an acid taste
- It is the most common household remedies for pains,aches,and pyrexias

## Signs & Symptoms

- Poisoning results from idiosyncrasy or overdose
- Giddiness, buzzing in the ears, edema of the face and eyelids, skin rash, cyanosis, dyspnoea, and later flushed skin and pyrexia
- Irritation of gastric mucosa
- Nausea and vomiting are common
- Hematemesis and malena due to erosion of gastric mucosa

- Fatal hemorrhage due to hypoprothrombinaemia
- Hyperpnoea due to stimulation of respiratory Centre(important indication of poisoning)----- leads to hyperventilation which in turn produces respiratory alkalosis
- Complex acid-base disturbances may follow
- Severe acidosis due to reduction of alkali reserve
- Ketosis,albuminuria and glycosuria
- Breath smells of acetone and a mistaken diagnosis of diabetic coma may be made.

## **Detection;**

Aspirin in urine can be detected by adding a few drops of ferric chloride. It develops a violet color.

## **Fatal dose & fatal period**

Even a small dose can prove fatal due to idiosyncrasy. The minimum fatal dose is 5 to 10 grams. The fatal period varies from few minutes to several hours.

## Treatment

- Gastric lavage with warm water and some quantity of 5% solution of sodium bicarbonate left in the stomach to combat acidosis
- Forced alkaline diuresis, peritoneal dialysis, and hemodialysis are useful
- Exchange transfusion may be necessary in severe cases
- Special attention directed to restoration of electrolyte balance and possibility of potassium loss

- Intravenous fluids to counteract effects of dehydration from vomiting and sweating
- Vitamin K if there is abnormal bleeding
- Blood or platelet transfusion.



## Postmortem Appearances

- Rashes on the skin
- Particles of Aspirin may be seen in the stomach
- Gastric mucosa is congested and eroded
- Petechial hemorrhages seen at other sites of the body due to hypoprothrombinemia
- Pulmonary edema.

## **Medicolegal Aspects**

Poisoning is generally accidental from idiosyncrasy or overdose.

# Paracetamol Poisoning

- Paracetamol (Acetaminophen), is now becoming a more common cause of overdose because of its widespread use in place of Aspirin.

## Symptoms & Signs

The symptoms can be described under three stages;

- Gastrointestinal(**FIRST STAGE**)
- Latent(**SECOND STAGE**);and
- Hepatic failure(**THIRD STAGE**)

## **FIRST STAGE;**

- Symptoms are mild
- Vomiting and other GIT symptoms
- Patient remains fully conscious
- False sense of security

## **SECOND STAGE;**

- Occurs after a lapse of about 24 hours
- Liver undergoes damage but patient is relatively pain free
- May complain of anorexia, epigastric pain, and malaise (due to hepatic damage)

## **THIRD STAGE;**

- Hepatic failure is seen after about three to five days in untreated cases
- Characterised by liver failure, gastrointestinal hemorrhage, cerebral edema, renal tubular necrosis and cardiomyopathy.

## **Fatal dose & fatal period;**

Ingestion of 20 tablets each of 500 mg of paracetamol is usually fatal within three to five days.



## Treatment;

- Admission to the hospital in suspected cases of overdose
- Gastric lavage within four hours of overdose
- Adequate hydration (to combat dehydration from vomiting) (important to remember that paracetamol causes fluid retention) (more than 2.5 litres of intravenous fluids daily would be risky)

- Dextrose infusion for hypoglycemia
- Bicarbonate infusion for metabolic acidosis
- Vitamin K, whole blood or plasma for generalised bleeding
- Oral methionine to prevent hepatic damage
- Hemodialysis for acute renal failure
- Antidote----N-acetylcysteine (Mucomyst) orally. It prevents hepatic damage
- Intravenous hypertonic glucose for cerebral edema

## **Postmortem Appearances;**

- Remains of tablets may be found in stomach
- Typical findings; rashes, jaundice, petechial hemorrhages, GIT bleeding, hepatic necrosis, renal tubular necrosis and cerebral edema.

## **Medicolegal Aspects;**

- Poisoning is generally accidental due to overdose and indiscriminate use as an analgesic and antipyretic
- Patients who attempted suicide have regretted the choice of this drug on account of painful interval between ingestion and death.

**The End.**

# Compulsory Duties of a Doctor

- 1. Compulsory notification:** births, deaths, infectious diseases, and food poisoning from a restaurant. In some states, industrial diseases are also notifiable.
- 2. Responsibilities to the state:** (a) responding to emergency military service, (b) reporting cases of homicidal poisoning or suspected homicidal injuries, such as stab or gunshot wounds, (c) reporting certain cases under category of privileged communication, especially, as regards, moral and social duties, and responsibility in criminal matters, (d) reporting unnatural deaths, and (e) reporting suspected abuse of children, spouse, or elderly, in some Countries.

# Voluntary Duties of a Doctor

- 1. Responsibility to patients**
- 2. Medical examinations**
- 3. Operations**
- 4. Issuing medical certificates**
- 5. Prisons and reformities**
- 6. Medicolegal examination and certificates**
- 7. Postmortem examination**
- 8. Sending pathological material by post, and**
- 9. Attending to accidents**

# Responsibility to Patients

- a) (implied contract)to continue to treat
- b) Reasonable care
- c) Reasonable skill
- d) Keep professional secrets inviolate except under privileged circumstances
- e) Not undertaking procedures beyond skill
- f) Special precautions taken in case of children adults not capable of taking care of themselves(eg. Applying hot water bottles)
- g) Special precautions when handling dangerous drugs and poisons
- h) Consultation with other colleagues under certain circumstances
- i) Keeping in touch with recent advances in the field



# Medical Examinations

- a) Consent taken
- b) Results kept secret
- c) Laboratory aids utilised when necessary
- d) X-rays taken in all cases of accident unless trivial

# Operations

- a) Consent taken
- b) Nature, extent and risks explained
- c) Precautions taken not to operate on wrong patient or wrong part
- d) Precautions taken for the safety of the patient by ensuring fitness for anaesthesia, check of count as regards sponges, needles, and instruments, and postoperative care
- e) No experimentation

# Issuing Certificates

Illness;vaccination;death;and for insurance,compensation, cremation,etc.The data mentioned must be true and to the best of doctor's knowledge and belief.

# Prisons and Reformities

- a) Certifying to facts regarding pregnancy
- b) Checking diet
- c) Inspection of lavatories

# Medicolegal Examination and Certificates

- a) Proper authorisation
- b) Identification
- c) Verification of facts, eg, in mental illness certificates
- d) Material preserved when necessary, eg, in cases of poisoning, drunkenness
- e) Laboratory aids utilised, eg, x-ray, microscopy, histopathology, antibody testing
- f) Certificates issued promptly
- g) All details given
- h) Copy preserved

# Postmortem Examination

- a) For scientific purposes and only after obtaining consent
- b) Not to be undertaken in medicolegal cases without proper authorisation

# Sending Pathological Material by Post

Precautions to be taken  
to prevent spread of disease.

# Attending to Accidents

A physician has an absolute right to select his patients. The physician who responds in an emergency, such as a road traffic accident is expected to exercise a reasonably prudent physician's standard of care and to offer that much help that is possible under the circumstances. Normally, first aid is rendered and the victim referred to his physician/hospital.



# RMP's Legal Duties in Case of Poisoning

- In all cases of poisoning, the doctor must record the preliminary particulars, viz. name in full, age, sex, occupation, address, date and time, brought by whom, history, dying declaration necessary or not.
- Information regarding suicidal or accidental poisoning cases (private practice)
- In accidental poisoning endangering the public- notifying public health authorities.
- In homicidal poisoning, duty to protect society, inform police officer or magistrate, precautions to prevent further possibility of poisoning.

- Maintenance of record of cases of suspected poisoning
- Collection and preservation of viscera, samples, stomach washings, dispatch to FSL for chemical analysis.
- Suspicious articles should be preserved.
- If death occurs, death certificate not issued, death communicated to nearest police officer for investigation.
- Arrangement for dying declaration (serious patient)
- The doctor in charge of a government or public hospital must report to police all cases of poisoning, either suicidal, homicidal or accidental, admitted to his institution.

# Fate of Poisons in the Body

- May be lost by vomiting or diarrhoea(unless given in small amount and in a liquid state)
- Once it is absorbed;
  1. excreted unchanged
  2. partly/completely metabolized
  3. converted into another active compound  
prior to further metabolism  
(biotransformation)
  4. when not metabolized-----found in original  
form/intermediate products in tissues  
(liver,bile) or in excreta(urine)

5. some inorganic poisons(arsenic)may be retained in tissues such as epidermis nails,hair and bones(after being eliminated from the rest of the body)
6. the bony skeleton also retains some poisons for long periods (arsenic,lead,radioactive isotopes)

# Diagnoses of a Case of Poisoning

- **In the living** ; can be made on the basis of signs and symptoms produced by the poison
- **In the dead** ; can be made on the basis of postmortem findings n chemical analysis of tissues/viscera and body fluids

# Poisoning in the Living

Evidence of poisoning depends on whether poisoning is acute or chronic.

## ➤ **Acute poisoning :**

- The person is previously known to be in good health
- Symptoms appear soon after suspected food, medicine or fluid has been taken (symptoms may be delayed in bacterial food poisoning)
- Affected with group of symptoms that do not conform to ordinary illness
- Other persons who have taken similar food, medicine or fluid are affected similarly and simultaneously
- Symptoms rapidly increase in severity and are followed by death/recovery
- Poison can be detected in ingested food, medicine, and fluid, or in vomit, gastric lavage fluid, blood, urine and stools of the victim.

➤ **Chronic poisoning :**

- Symptoms develop insidiously and gradually
- Exacerbation of symptoms after suspected food, medicine or fluid is administered
- Remission/complete disappearance of symptoms when patient is removed from usual surroundings
- Main symptoms; malaise and gradual deterioration of health
- Repeated attacks of undiagnosed GIT irritation may arouse suspicion of homicidal poisoning.

# Poisoning in the Dead

The evidence of poisoning will depend upon

## 1) **Postmortem examination;**

- smell from clothes and body
- Froth at mouth and nose
- Stains about lips and chin
- Color of the skin and postmortem lividity
- Marks of injection
- Condition of natural orifices
- GIT should be looked for signs of corrosive and irritant poisoning( hyperemia,softening,ulceration,and perforation)



## 2) **Chemical analysis ;**

- Most important proof of poisoning
- Analytical detection of poison in parenchyma of organs
- Finding poison in suspected food, medicine or fluid.

## 3) **Experiments on suitable animals ;**

- Suspected food, medicine or fluid or viscera can be fed to domestic animals such as cat and dog; the poison will produce similar effects in these animals as in humans.

## 4) **Moral and circumstantial evidence ;**

- Clues regarding purchase of poison by victim or accused, his behaviour, conduct of those looking after victim, suicide note, history of quarrel, financial problems
- Body may be disposed off secretly/hastily .