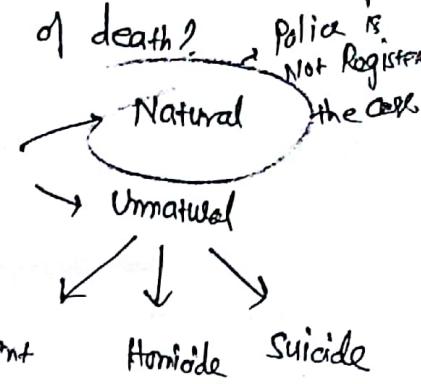


# Forensic Medicine $\Rightarrow$ Application of Medicine in Law.

26/4/18



After P.M.  $\Rightarrow$  What is the Manner of death?  
 ↓  
 it means death is



Q. 33 yr old ♀; Healthy cond'n; visited her friend in hospital. Returned home & had hemiplegia & contusion all over. Accident body? cause of death?

- H/o  $\rightarrow$  How Many Years ( $\therefore$  Marriage)
- $\rightarrow$  How Many kids
- Any H/o Disease
- Any H/o Drug intake

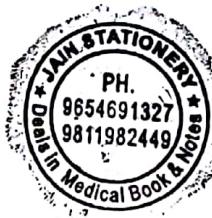
$\Rightarrow$  OCP induced coagulopathy  
 ↓  
 Natural cause of death

Followed only by doctors

Followed by anybody  
 (doctors; government  
 people).

## Medical Jurisprudence

- Law in Medicine  
 How the Law affects all profession

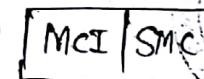


## Medical etiquette

- $\rightarrow$  Conventional Law of Courtesy  
 e.g. Not charge for doctor's colleague
- $\rightarrow$  A breach of etiquette is Not punishable

## Medical Ethics

- $\rightarrow$  Moral Principles
- $\rightarrow$  Self imposed code of conduct.



## Code of Medical Ethics

### WARNING NOTICES

ADULTERY (Cheating of spouse);

ASSOCIATION / COVERTING

ADVERTISEMENT

ALCOHOL (Not examine if drunk and)

ADDICTION (Being drug addict)

ABORTION (UNLAWFUL)

↳ violates the MTP

6 A's  $\Rightarrow$  ①

②

③

④

⑤

⑥

2 Unqualified individuals  
 like compounder

- Advertise on Small Board
- Name, qualification
- can't display fee other than chamber
- Not more than twice advertisement.

## ⑥ DICHOTOMY ('FEE SPLITTING')

### - ⑨ PROFESSIONAL SECRECY

Concerned Authority  
↓  
CIVIC SIN

C: Crime      S: Servant & Employee  
I: Infectious Disease      I: Interest & self  
V: Venereal Disease      N: Mutilable Disease & Negligence suits  
I: In Patient's Interest  
C: Court & Law

exception ⇒

PRIVILEGED COMMUNICATION

Concerned Authority  
↓

It makes communication privileged.

Crime → Some one told  
that he act the  
crime

→ Tell the Police

- Some one has AIDS → Sexual Partner
- Court
- Patient Interest - e.g. colour blindness - call tacker

9) Violates the warning notice

↓  
Serious Professional Misconduct / Infamous conduct / Ethical Negligence

Punishment

(A) WARNING

Again

Fine

Impersonation

(B) PENAL ERASURE  
OR  
PROFESSIONAL DEATH SENTENCE

Temporary

Permanent

? (X) → given by court only,

⇒ Punishment of Infamous conduct is given by firstly  
"State Medical council"



Who decides in SMC?  $\Rightarrow$  Professional colleague in SMC



If Not happy w/ the decision; Appeal



At Central Health Ministry

$\downarrow$  Forward to

MCI



Q. The Disciplinary control over Professional Misconduct is primarily Maintained in  $\Rightarrow$  "State Medical council (SMC)".

### LEGAL PROCEDURE

INDIAN PENAL CODE (1860)  $\Rightarrow$  Definition & Punishment of crime  
(I.P.C.)

CRIMINAL PROCEDURE COURT (1973)  $\Rightarrow$  Procedure followed after crime

INDIAN EVIDENCE ACT (1872)  $\Rightarrow$

[RPC: only in J&K  
CrPC: Not valid under section 370  
Ranbir Panel code]



Definition / Relevancy / Recording / Weightage of evidence



Oral  $>$  Written

$\hookrightarrow$  blc of cross-examination

AMENDED / MODIFIED  $\Rightarrow$  CRIMINAL LAW (AMENDMENT) ACT, 2013



### INQUEST

$\hookrightarrow$  Inquiry into the cause of death

① POLICE INQUEST,

② MAGISTRATE INQUEST;

③ CORONER INQUEST;  $\rightarrow$  started in 1872; last done 1999 (Bombay)

④ MEDICAL EXAMINER INQUEST.  $\rightarrow$  Best inquest

$\hookrightarrow$  JURY decide the guilty /  
 $\hookrightarrow$  Odd No. of Members  
(5, 7, 9, 11, 13)

$\hookrightarrow$  Not done in India

↳ Lowest Ranking who do the Police Inquest  $\Rightarrow$  Head constable



MAGISTRATE INQUEST  $\Rightarrow$  I.R.C

e.g. death in juvenile home,  
death in outside court

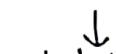


constable



Head constable  $\rightarrow$  Lowest Police to  
 $\downarrow$  conduct inquest.

Assistant Sub-Inspectors



Sub-Inspectors  $\rightarrow$  Inspector  $\rightarrow$  SHO  
(Station House Officer)

$\rightarrow$  Death in 7yr of Marriage

• DOWRY DEATH  $\Rightarrow$  304(B) I.R.C

↳ Punishment  $\Rightarrow$  {7yr - L.I.}\*\*

• DEMANDING DOWRY  $\Rightarrow$  Dowry Prohibition Act, 1961

↳ {5yr + 1500/- + Return the dowry}  $\Rightarrow$  Punishment



• EXHUMATION  $\Rightarrow$

. Digging out the dead body

. Early Morning hours

. No time limit (can be done at any time after death)

. Preserve about 500 gm of earth in contact w/ body from 6 different sites



$\Rightarrow$  Where the poison diffuses the soil into the body

P.M. IMBESSION (M/C  $\Rightarrow$  As Poisoning)

FINE

## IMPERSONATION

(I) MAHISIRAFI E COURT

1. 2 <sup>nd</sup> CLASS JUDICIAL MAGISTRATE	<u>5000/-</u>	1 yr
2. 1 <sup>st</sup> CLASS JUDICIAL MAGISTRATE	<u>10,000/-</u>	3 yrs
3. CHIEF JUDICIAL MAGISTRATE	No Limit	7 yrs



(ii) SESSION COURT  $\Rightarrow$  Highest Court of District

1. ASSISTANT SESSION COURT	"	10 yr
2. SESSION COURT	"	L.I. / Deaf

L.I. / Death sentence (Q)

(III) HIGH COURT → Confirmed by Highest court of state

(iv) SUPREME COURT ⇒ Highest court of Nation

Q. Lowest court who commits the decision?  $\Rightarrow$  High court.

Q. Who will grant the Amnesty?  $\Rightarrow$  President of India

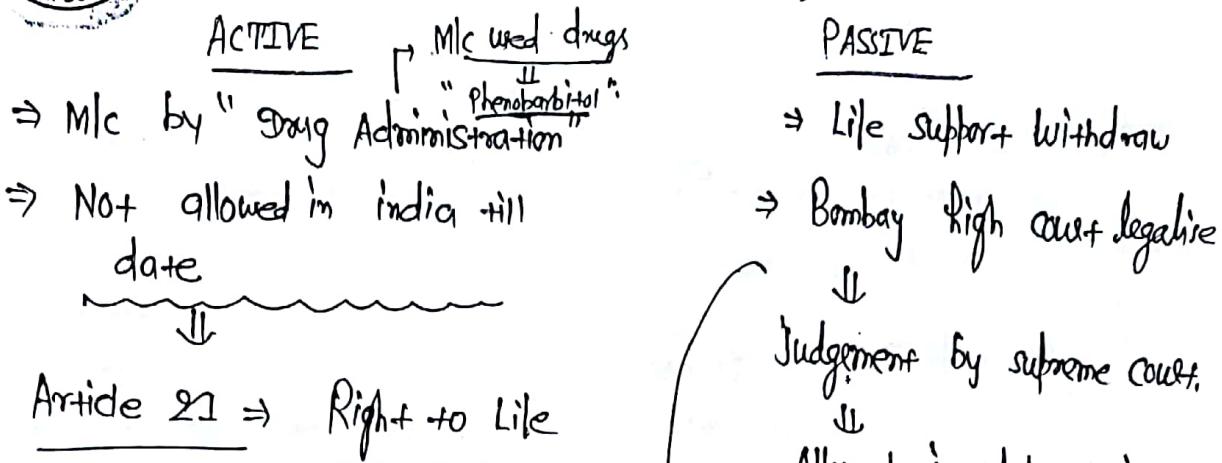
## Full Pardon. (पुरा माफ़)

High court  $\Rightarrow$  Law of State

Supreme court  $\Rightarrow$  Law of Nation

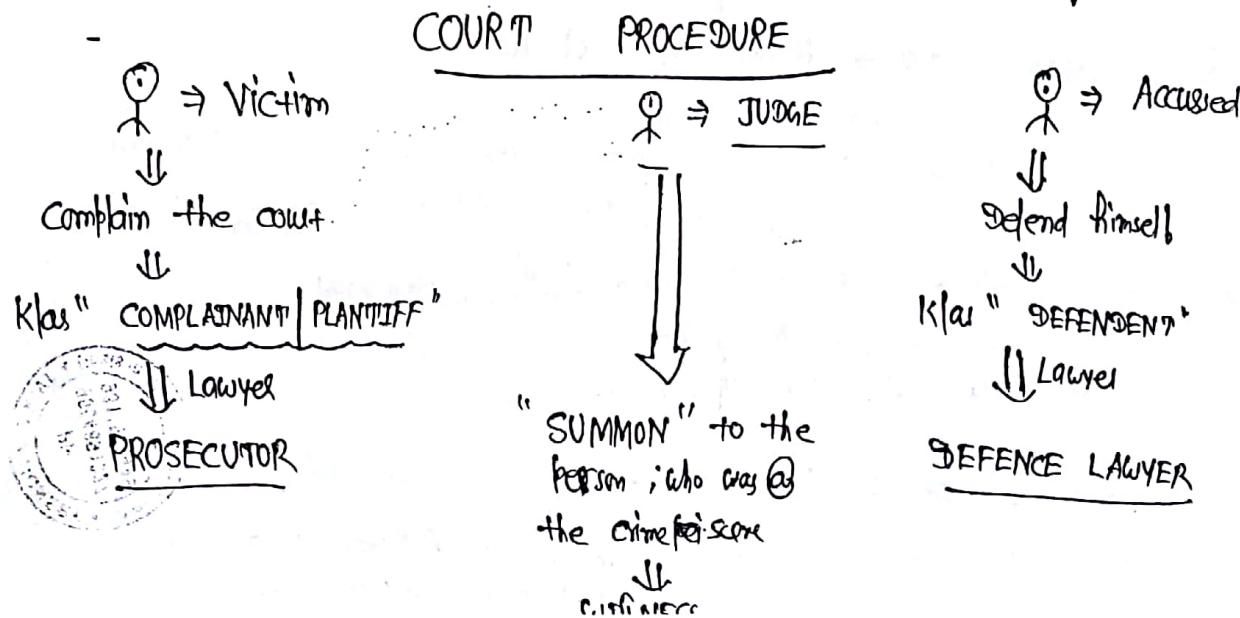
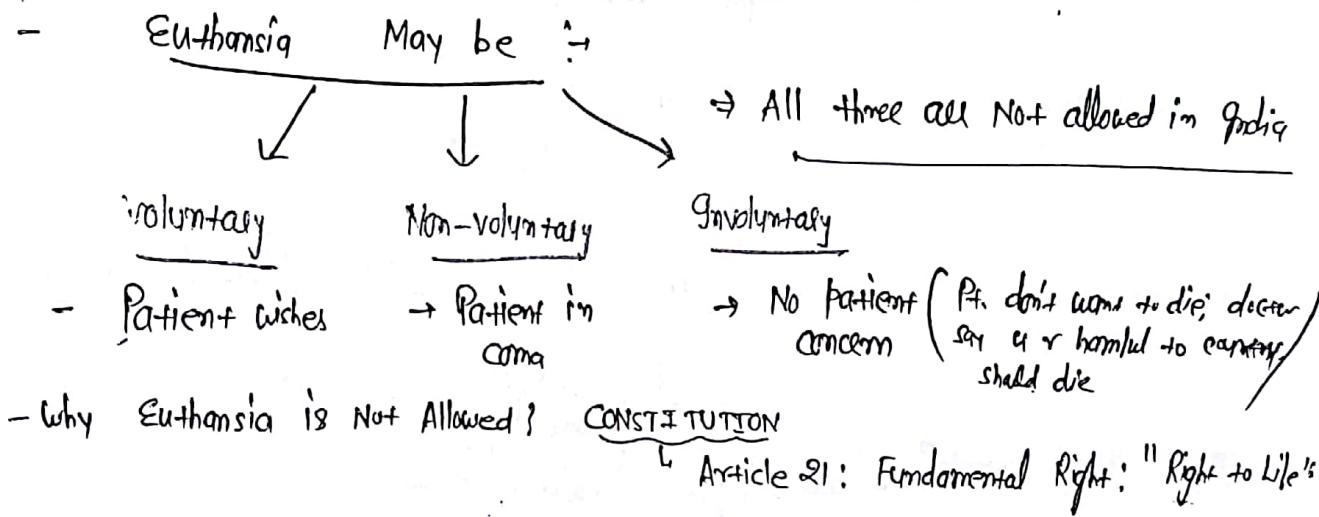
Q. Lowest court to imprison Maxm for 10 yrs? Assistant Session court  
A. " " 1 / 1 / In death? Session court

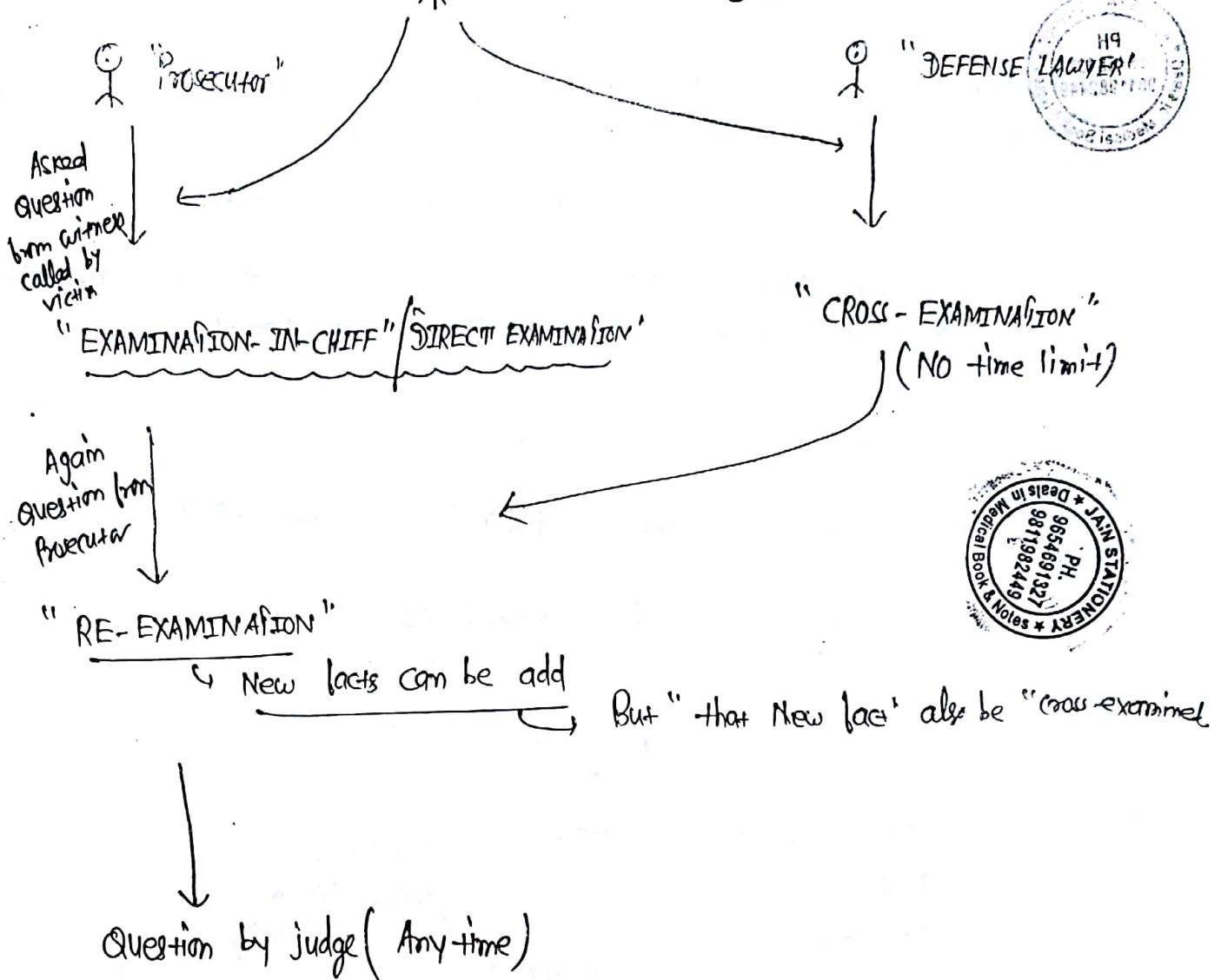




"Netherlands" Legalise euthanasia  
firstly. (Both Active & Passive)

Decision comes in "ARUNA SHAGBEG"  
Case 2011 (7th March)





\* When witness called by "Defense Lawyer" then cross-examination done by Plaintiff; Re-examination / Examination-in-chief by defense Lawyer

\* LEADING QUESTIONS → In cross-examination

↳ Answer is in Yes/No.

↳ Also Necessary in a wound certificate; A Medical certificate & a postmortem certificate (up to 3).

\* Regarding OATH: Out Oath evidence can't be recorded

↳ 124r ⇒ false oath

\* False evidence under oath ⇒ "PERJURY"

↳ sec 191 I.P.C (definition)  
Punishment ⇒ 193 I.P.C (life imprisonment)



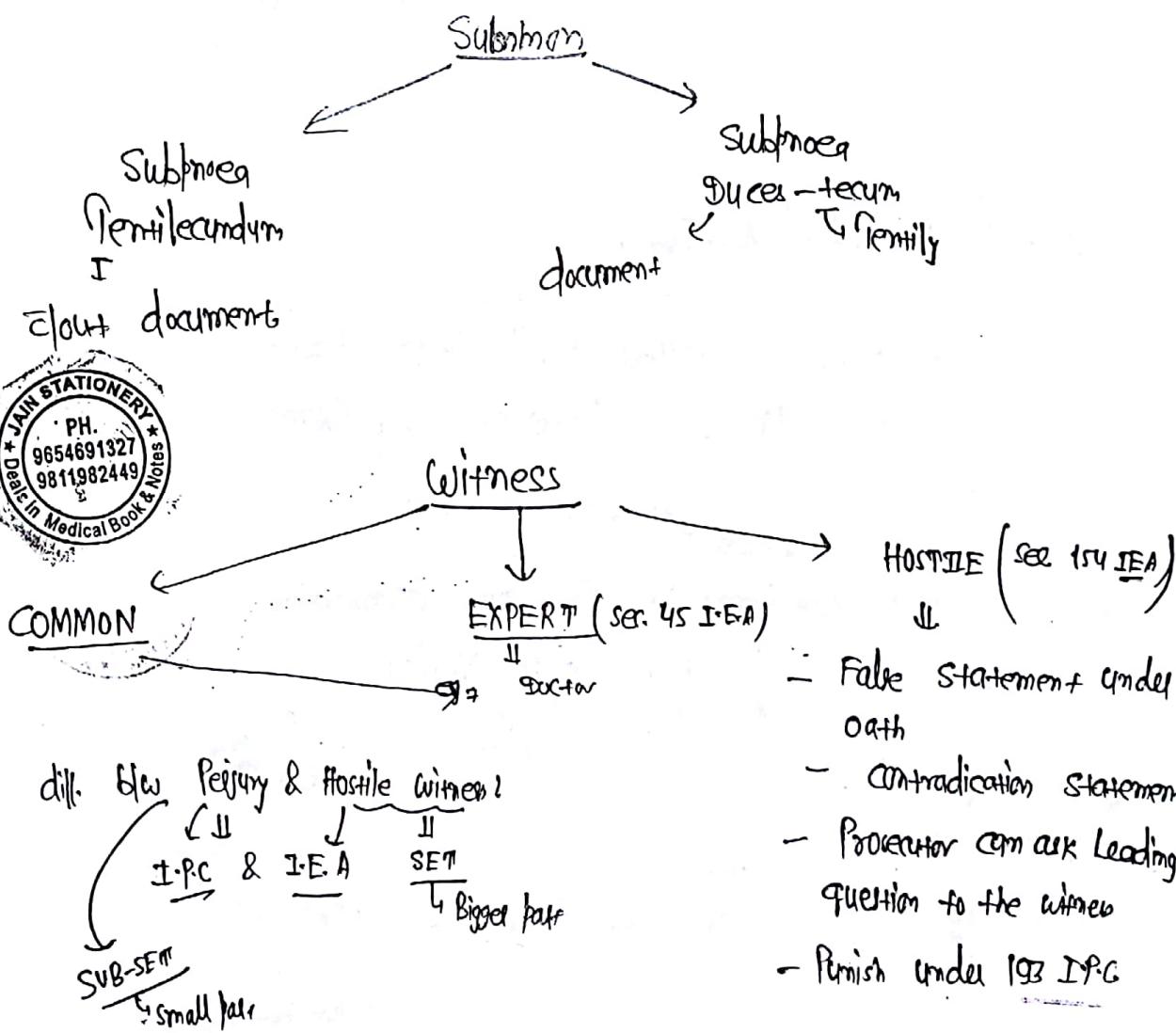
Kas " SUBPOENA" Under Penalty,

Both civil & criminal can punishment

Q. Higher court always have priorities than lower court; No matter what is the case "civil/criminal".

CONDUCT MONEY ⇒ Money given to attained Summons in civil cases.

DIET MONEY ⇒ In criminal cases



- circumstances leading to death (Statement talking about)
- No oath
- Anyone can Record ; Best Recorded by  
 ↓  
 Magistrate > Doctor > Police > civilian

all should Read out @ court ; if individual give dying declaration in front of all.

- if the patient survive ; then it has "CORROBORATIVE VALUE"
- Role of Doctor  $\mapsto$  COMPENSATORIES (Pt. is fit for statement)

### Dying deposition

- Witness gave Statement ; whole court comes @ Hospital

b/c "Leading questions" allowed  
 single best answer ; who makes it better than  
 dying declaration

Oath  
 Cross-examination  
 Re-examination }  
 EIC



- Not practice in India

- Dying deposition > Dying declaration

Q: ♀ died clin 4 years Under Suspicious circumstances! Autopsy?  
 (a) 304; (b) 302; (c) 174 Cr.P.C (d) 176 Cr.P.C

Q: Power to Recall witness ? Cr.P.C 311

Q: Evidence Recording in previous proceeding is relevant in subsequent proceeding?  
 S.33 I.E.A. (Same Recording is Relevant in future proceeding).

## PROFESSIONAL MALPRACTICE



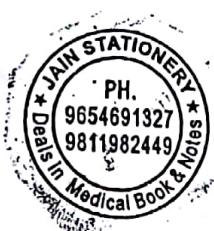
- ↓
- Fined / Prison
- Case would be decided by court.

Civil  
(Court)

criminal

- Any Negligence that can be compensated by Money.

- Gross Negligence
- decide by supreme court of india
- illegal
- Gross inattention toward patient.
- Negligence that can't be compensated by Money.



4 D's ⇒ ① DUTY; - Pt - Doctor Relation

② DERELICTION; → You don't follow standard

③ DIRECT CAUSATION; - cause harm (direct)

④ DAMAGE.

\* 91 Doctor is Negligent; He is punished Under:

304(A) I.P.C ⇒ Negligent causing → Death  
2yr ± Fine

337 I.P.C ⇒ Negligent causing → Hulf  
6months ± Fine

338 I.P.C ⇒ Negligent causing → Minor Hulf  
2yr ± Fine

See 270 I.P.C. ⇒ Malignant Act Regarding 'Infectious disease'

6 Months ± Fine

See 270 I.P.C. ⇒ Malignant Act Regarding 'Infectious disease'  
with Intention  
2yr ± Fine

\* Defences available to a doctor in a Negligence:

- ① Corporate Negligence ⇒ Hospital has to provide
  - ↳ Infrastructure & Manpower { (X) → If Not, Hospital is Negligent }
- ② Products Liability ⇒ Manufacturer Negligence for his product.
- ③ Error of Judgement ⇒ You decide to go in the interest of Patient
- ④ Therapeutic Misadventure ⇒ Idiosyncratic Rxn to Drug
  - ↳ अपनी रेस के स्वतंत्र रूप से होती है; but Something Not controllable, or Not in My Hand
- ⑤ Res Judicata / Doctrine of double Jeopardy ⇒
  - ↳ कोई दोबार काम की गई नहीं तो No Punishment,
  - Rest the decision Rest.
- ⑥ Res Judicata - Limitation period ~ 2 yrs.
  - ↳ If I am Negligent, then Pt can file the case upto 2 yrs.
- \* All Above defence can use @ civil / criminal both Negligence
- ⑦ Contributory Negligence ⇒ Defence only in civil cases
  - ↳ Both Patient / Doctor are responsible

## ① Last clear chance

Doctrine if the doctor fails to prevent

Doctor

is Responsible

↓  
damage resulting from the negligent act of the patient; even after getting

clear time, he can't

breadal contribution

Negligence in civil case

## ② Avoidable consequence

Rule

Patient is Responsible

AIMS May 15  
Q.

Pt. comes to you in large Laceration. You did Regular dressing. Pt. didn't give much care. During follow-up; patient was repeatedly told to get the dressing done timely but patient didn't do the dressing himself, saying that he was busy. Finally the wound enlarged & underlying bone developed osteomyelitis. Which of the following statement is true regarding above mention situation?

- a) Doctor is guilty under "Last clear chance" Doctrine
- b) Doctor is not guilty under "contributory Negligence".
- c) Doctor is punishable under avoidable negligence
- d) Doctor is guilty as he prescribed wrong Medicine

Terms in Negligence :→ (I) RES IPSA LOQUItur :→

Fact speaks itself.

(II)

VICARIOUS LIABILITY / RESPONDENT SUPERIOR / CAPTAIN OF SHIP DOCTRINE

\* applicable only in civil Negligence, Not in criminal cases

Let the Superior Reply

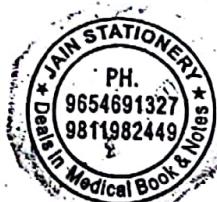
"HOD Medicine" (Captain)  
"Intern" (Employee).

the employer is responsible for Negligence of employee

↳ Hospital Responsible (Vicarious Liability)

DOCTRINE OF DEEP POCKETS :→ उसकी पकड़ो ग्रसकी Pockets (Money) लेंगे हैं।

BORROWED SERVENT DOCTRINE :



New Act Intervening.

Homicide

(7)

Usually Not accepted by the court;  
Unless the Doctor is confirmed  
Negligent,

Head injury to the patient → Doctor came → Septicemia → Death

~~QNB May 2017~~

Compoundable offenses ⇒ There can be out of court settlements.

↳ e.g. → Theft,

\* Non-compoundable offenses ⇒ These offenses can't be out of court settlements.  
↳ e.g. → Murder

\* SUMMON : Issued Under (S. 61-69 Cr.P.C.)  
↳ (Not attended)

2nd summon : (Again Not attended)

↳ NOTICE (S. 350 Cr.P.C.)  
(Show cause Notice)  
↳ Again Not attended.

↳ eg ⇒ Son's Marriage (Social obligation)  
Heart attack

Valid Reason  
(No Punishment)  
Invalid Reason  
(Punishment : Rs 100/-)

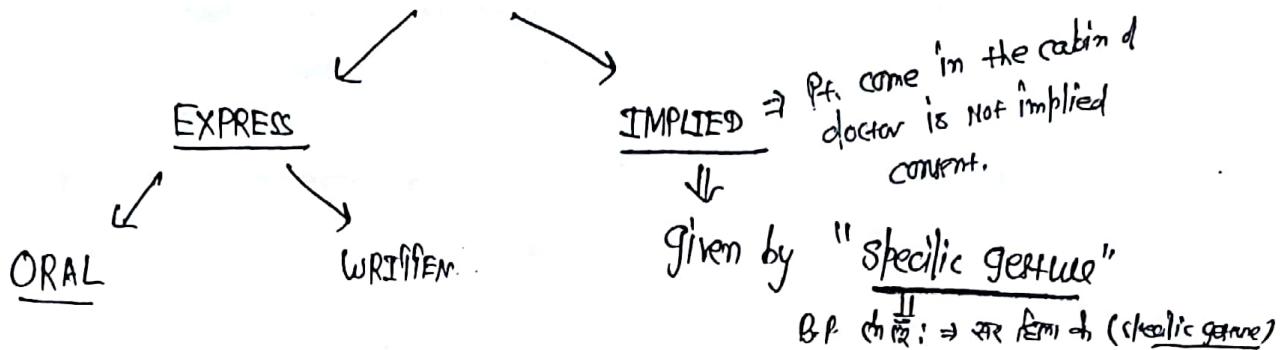
Bailable warrant  
Non-Bailable warrant } Fine + Imprisonment

Q. Burn pt.; ♀ by husband; treated ⇒ She goes into O.R. for plastic Sx. Anesthesia given Sch → Pt. dies on Sx table; who is Responsible?

- (A) Anaesthesiology ⇒ Pt. is burnt case; ∴ Sch is Not preferred; also Anaesthesiologist is Not controlled by Surgeon.
- (B) Surgeon
- (C) Husband
- (D) Surgeon d/t Vicarious Liability



- Sec. 13 - Indian Contract Act, 1872
- Voluntarily Agreement



- All the consent is valid in court of Law.
- Consent should always be "Informed"

- You are telling Full disclosure to patients.
- except ⇒ "Therapeutic privileged"

\* BLANKET CONSENT ⇒ Invalid in India

↳ consent taken for everything together

\* - consent taken b/c of Assault ⇒ 351 I.P.C  
↳ Cloud consent

↳ except Emergency ⇒ protected under 92 I.P.C

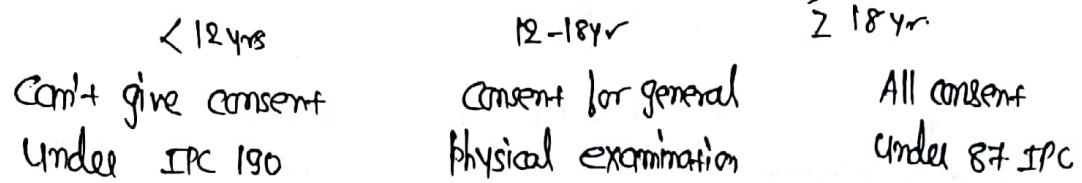
↳ like saving Rx

↳ consent can't obtain w/out reasonable delay

e.g. RTA → Profoundly bleeding → Consciousness oriented → give No. consent

↳ Uninformed Refusal

↳ No Rx.



91 I.P.C. ⇒ Consent for illegal Act is invalid  
 Eg ⇒ Murder in form consent; Not valid (illegal)

### SECTIONS

#### Cr. P.C.

#### OFFENCES

#### cognizable

- Arrest without warrant
- 2(c) Cr.P.C

Eg ⇒ Murder; Dowry death;  
 Rape; Dacoity;  
 Robbery; Attempted suicide  
 Ragging;

Grievous hurt;  
 Voyeurism;  
 Stalking;

#### Non cognizable

- Arrest w/ warrant
- 2(l) Cr.P.C

Eg ⇒ Hurt.  
 Theft,

#### Non-Bailable

||

Court give bail

#### Bailable

Police give bail

#### OFFENCES



- Sec. 44 ⇒ Injury (Definition)
- Sec 46 ⇒ Death (Definition)
- Sec 82 ⇒ Child < 7 yrs is Not Responsible  
Railways Act : child > 7 yrs is Responsible  
7 yr old: Punishable for Pulling chain; Not Responsible for killing
- Sec. 84 ⇒ Criminal Responsibility of Insane

(Mc Naughten's Rule) | Legal test | Right or wrong test

CURREN'S RULE

DURHAM'S RULE

Irreversible impulse test

American Law Institute Rule

Federal Law

✗ Not applicable in India

→ all are Rule for Insane

⇒ If a person has Insight; then the person is Responsible for crime

e.g. ⇒ Psychosis → Insight → ✗ Not Responsible

Neurosis → Insight → ✓ Responsible

Kleptomania → Insight → ✗ Responsible

Delirium → Insight → ✗ Not Responsible

Automatism → Not Responsible

Sleep Walking → Not Responsible

Hypnosis → Responsible

\* DURHAM'S RULE ⇒ Accused is Not Responsible for the act; if his acts resulted from Mental disease or defect.

\* CURREN'S RULE ⇒ A Person is not Responsible; if at the time of committing the crime; he didn't have capacity to regulate his conduct.

↓  
Person is Not Responsible

Sec. 86 ⇒

Act under Voluntary intoxication

↓  
Person is Responsible

\* if crime done in (delirium tremens) → drugs + Alcohol withdrawal.

↓  
Not Responsible

Sec. 88 ⇒ Act Not intended to cause death; but can cause death or grievous hurt; done by consent in good faith & for the benefit of that person eg ⇒ Death of pt caused by surgery

Sec. 197 ⇒ Issuing False certificate done by Surgeon

↓ Punish ≤ 7yr

Penal practice ⇒ only Medical council; Not Court.

Sec 201 ⇒

causing disappearance of evidence

↓ Punishment = 2yr ± Fine

eg ⇒ Embalming Clout Death certificate

↓ Punishable under 201.

- Once a death certificate is approved it means person had already Post-Mortem

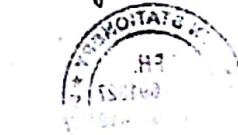
Embalming agent ⇒ Methanol;

Formalin;

Phenol;

Glycerine etc

- Unclaimed Body ⇒ after 48 hrs



Sec. 300

⇒

Murder definition

Sec. 302

⇒

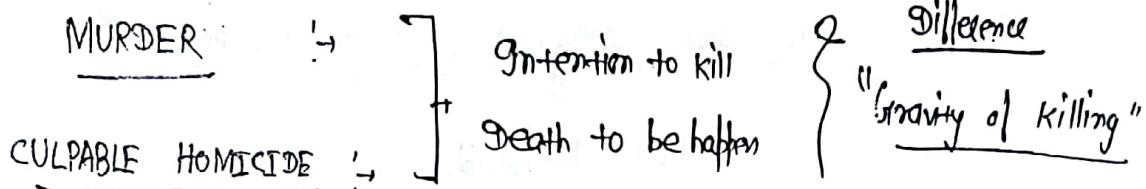
Murder (Punishment)

Sec. 304

⇒

Culpable

Homicide (Punishment)



Sec. 307 ⇒ ATTEMPT TO MURDER ↴ Intention high; Dead not happen.  
 ↴ { 3yr Impersonation + Fine}

Sec. 308 ⇒ ATTEMPT TO CULPABLE HOMICIDE ↴ Intention Less; Dead not happen.



↳ 3yr Impersonation + Fine

Suicide

Aberment (अवस्था)

- Provoke for Suicide
- Punish in 306 I.P.C

Attempt

- Punish in 309 I.P.C
- 1 yrs. Punishment
- Non cognizable offence
- Not Required to Report the Police

G 8/c See 39 Cr.P.C

↳ Public to give information of certain offences; Not talk about 309 I.P.C

\* Gravity of killing is determined by Nature of actions of Accused ↴

e.g. Stab once & Run Away: chance of survival! Culpable Homicide  
 Stab so Many times: No chance of survival! Murder



II

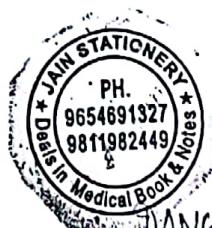
expulsion of product of conception before full term according to Law

- Sec 312 : Abortion  $\cong$  consent { Death of (Death during)   
 Sec. 313 : Abortion  $\cong$  out consent } 314 I.P.C  
Sec. 315 : Infanticide   
Sec. 316 : Causing death of a quick Unborn child; while trying to kill Mother; (culpable Homicide)  
↳ quickening in Primigravida  $\Rightarrow$  20 weeks  
↳ quickening in Multigravida  $\Rightarrow$  16-18 weeks  
Sec. 317 : Abandoning a child  $<$  12 yrs of Age  
Sec. 318 : Concealment of child  
↳ Any birth/ death should be reported  $\cong$  in 21 days.  
Sec 319 : HURT (DEFINITION)  
Sec 320 : GRIEVOUS HURT (DEFINITION) : 8 clauses ↳  
(A) Emasculation / Impotence (Applicable only to Males);  
(B) Permanent privation of Sight of either eye  
↳ (5% / 10% / 100%)  
Injury Not Healing itself; do Sx.  
(C) Permanent privation of Hearing of either ear  
(D) Privation of Member / joint [ Anything that has its own function ]  
Member of body.  
(E) Permanent destruction / impairment of Power of Member / joint  
(F) Permanent disfigurement of Head & face  
↳ e.g. 60 yr old & 20 yr Model; shape of Head? No one is grievous hurt,  
(G) # dislocation of Mandible (Bone); tooth.



Pain for 20 days or | Unable to follow ordinary Pursuits

II  
Pursuit is Not ordinary Pursuit.



Any injury; where death can happen

DANGEROUS INJURY  $\Rightarrow$  Any injury; which causes threat to life  
Part of Grievous Hurt.

- \* Sec. 323  $\Rightarrow$  Punishment for voluntarily causing Hurt; Punish = 1yr
- \* Sec 324  $\Rightarrow$  Punishment for voluntarily causing Hurt by dangerous weapons  
Punishment  $\Rightarrow$  3 yrs.
- \* Sec. 325  $\Rightarrow$  Punishment for voluntarily causing Grievous Hurt  
Punishment  $\Rightarrow$  7 yrs
- \* Sec. 326  $\Rightarrow$  Punishment for voluntarily causing Grievous Hurt by dangerous weapons ; Punishment  $\Rightarrow$  10 yrs
- \* Sec. 334  $\Rightarrow$  Punishment for voluntarily causing Hurt on provocation  
Punishment  $\Rightarrow$  1 month + 500/-
- \* Sec. 335  $\Rightarrow$  Punishment for Grievous Hurt on provocation  
Punishment  $\Rightarrow$  4 yrs + 2000/-

Dangerous Weapons  $\Rightarrow$  Shooting / Stabbing / cutting

X  $\xrightarrow{\text{Stick; Bruise}}$  Y (Bruise)  
(Not dangerous) |  
on provocation  $\xrightarrow{\text{Hurt}}$   $\Rightarrow$  Sec 334  
Voluntarily causing  
Hurt on provocation.

(Dangerous) weapon  
Abraham  
on provocation

Q. Knile } 326  
# } 104yr  
Provocation } 4yr + 2,000/-

Voluntarily causing hurt on provocation  
II  
if provocation is Removed then  
323 & 324 applicable.

Q: AIMs

X → Y

Shouts;  
Intention to kill;  
Thigh → Bleeding

1. 324	1. 324	1. 324
2. 326	2. 326	2. 326
3. 335	3. 335	3. 307
4. 304	4. 308	4. 308

Sec. 354 : Assault to outrage the Modesty of female  
see 509 : Insult to outrage the Modesty of female  
by words (obscene comments)

Amendment in 2013 :

354(A) : Sexual Harassment

354(B) : Disobedient a ♀ in Public

354(C) : Voyeurism

354(D) : Stalking

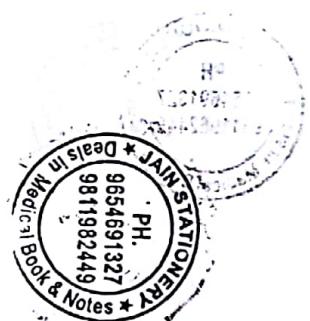
Physical  
(प्रौद्योगिकी करना)

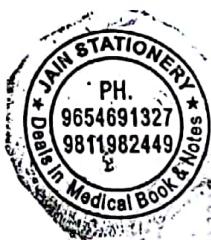
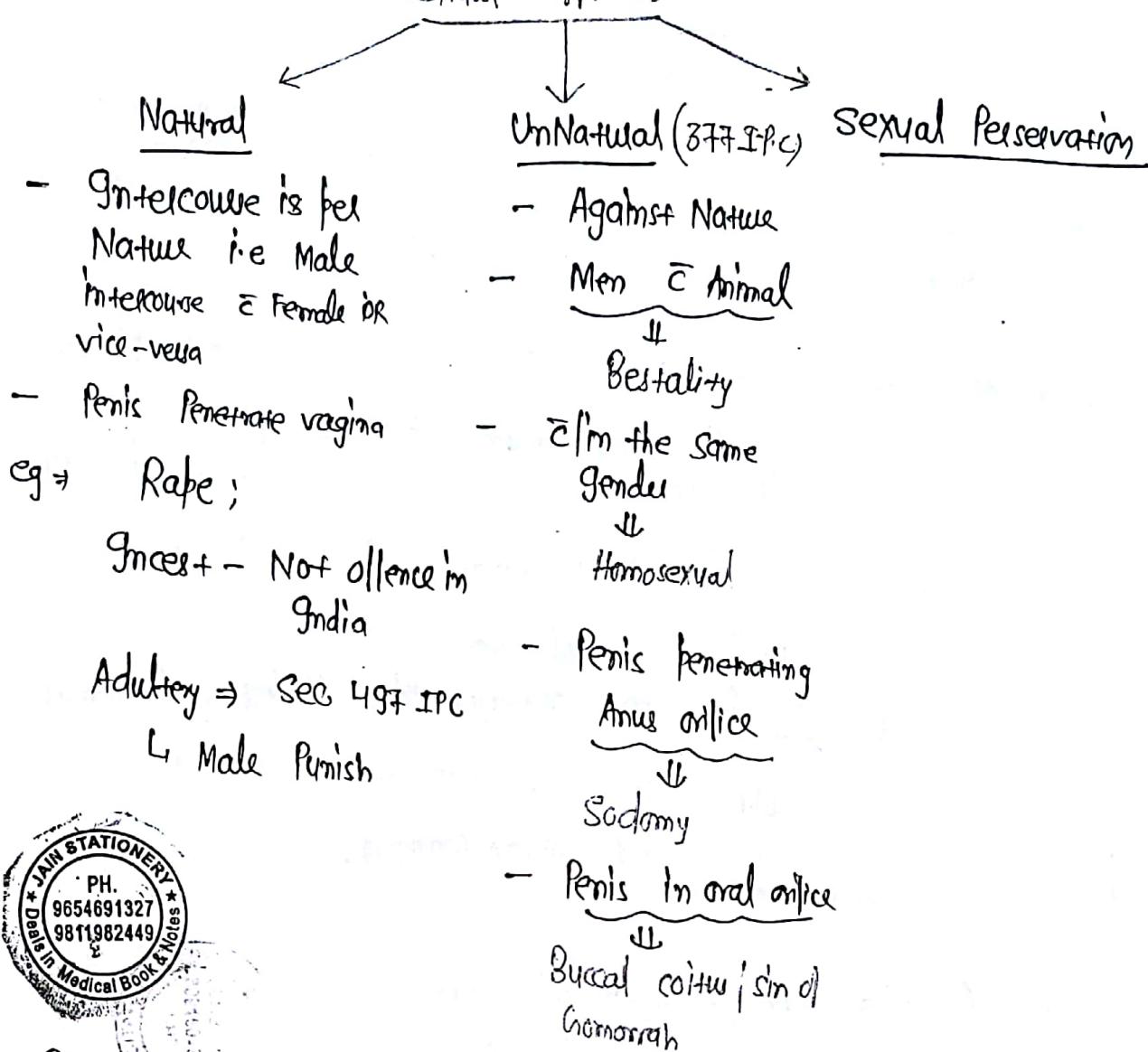
for the 1st offence :

Digital  
via What's app ; email  
Up to 3 yr Jail (cognizable & Bailable)

for the 2nd offence :

Up to 5 yr Jail (cognizable & Non-Bailable)





## RAPE

Sec. 375 I.P.C (Definition)

$\hookrightarrow$  2013 Amendment

Age of consent  $\Rightarrow$  18 yr (Married/Unmarried)

Statutory Rape  $\Rightarrow$  Sexual intercourse  $< 18$  yr.

$\text{♀} \rightarrow$  Rape  $\rightarrow$   $\text{X}$   $\Rightarrow$  Not charged in India

$\hookrightarrow$  Gang Rape  $\rightarrow$   $\text{X}$   $\Rightarrow$  Not charged in India  
 $\hookrightarrow$   $> 1$  person

Sec. 376 I.P.C  $\Rightarrow$  Rape Punishment

$\hookrightarrow$  7 yr. — Life imprisonment

$\hookrightarrow$  Rest of life

↓  
Give Death  
Sentence to  
accused

1. victim - Death
2. victim - Persistent vegetative state  
↓  
coma → cortical Brain death,

sec 376(B) ⇒ Husband - wife clot consent during separation

↓  
2-7 yrs. Bailable (only bailable Rape)

Marital Rape ⇒ No Punishment in India.

↳ Husband has power to call sex after Marriage  
- If you have to answer clot option; No offence; then select 376B.

sec 376(c) ⇒ Sexual Intercourse by a person in Authority

↓

Punishment ⇒ 5-10 yr

sec 376(d) ⇒ Group Rape

↳ Punishment ⇒ 20 yr - L.I.

sec 376(E) ⇒ Death Sentence to accused if he is a Repeat offender.



- No Need of Consent
- Request of Medical examination  $\geq$  Sub-inspector

Sec. 164(A) Cr.P.C  $\Rightarrow$

- Medical examination of Rape victim
- Consent Required
- for consent  $\geq$  12 yrs in this case
- Male/Female both doctor can examination in presence of Female attendant.
- Test  $\Rightarrow$ 
  - Toluidine blue
  - Lugol's iodine

↓  
to visualize Micro-laceration

↓  
can be used for Max<sup>m</sup> 4 days after intercourse

Sec. 327 Cr.P.C  $\Rightarrow$

In "camera trial" done in Rape cases  
 ↓  
Misnomer  $\Rightarrow$  Limited people allowed in court,

Sec. 228(A) IPC  $\Rightarrow$

Punishment of disclosing the identity of Rape victim

↓  
 Punishment  $\Rightarrow$  2 yr



## Male homosexuality

## Female homosexuality

Klæs" "Tribadism; Lesbianism"

### Active

Klæs "Butch/Dyke/  
Bull Dyke"

### Passive

Klæs "Femme"-

\* SODOMY / BUGGERY / ANAL INTERCOURSE  $\Rightarrow$  "Greek Love"

### ACTIVE

- Preferred children

Klæs "Pedetrant/Pedophile"

### PASSIVE

$\Rightarrow$  child  $\Rightarrow$  Klæs "Catamite"

{ Act is  
"PEDOPHILIA"

\* SIN OF GOMORRAH (BUCCAL CIRUS)  $\Rightarrow$  Fellatio  $\Rightarrow$  Oral stimulation of Penis;  
Cumming  $\Rightarrow$  Oral stimulation of female genitalia

\* Feature of Habitual Passive agent ↴

① Lateral buttock traction test  $\Rightarrow$   $\oplus$

↳ In knee/elbow position; anal sphincter is completely Relaxed  $\Rightarrow$   $\oplus$

② Tyre's sign  $\Rightarrow$   $\oplus$

↳ Bluish discolouration seen around Anal Margin & dilation of vessels

③ Skin tags are present;

④ Funnel shaped Anus;

⑤ Skin will be shaved.



9654691327  
9811982449  
Details In Medical Book & Notes

Sexual gratification. ~~out~~ out of intercourse

SADISM ⇒ Pain → Partner;

MASOCHISM ⇒ Pain → Self

↳ Seen in "Autoerotic Asphyxia"

Co-existing together ⇒ "BONDAGE"

FETICISM ⇒ Object of desire

↳ PARTIALISM ⇒ Desire for part of body.

Klismaphilia ⇒ Pleasure by use of enema.

Urophilia / Urinationism ⇒ Pleasure by sight / urine / making a person urinate on self.

Coprophilia / Scotophilia ⇒ Pleasure by obscene language.

Masturbation / Ibitation / Onanism ⇒ Punishable act; if done in public; otherwise Not.

Punishable sexual perversion

Exhibitionism ⇒ display of private part in public

↳ Under 294 I.P.C

Frotteurism ⇒ Rubbing against private part of unsuspecting individual in public

↳ Under 354 / 354(A) / 290 I.P.C

Necrophilia / Necrophagia ⇒ 297 I.P.C ⇒ Showing disrespect to a dead body

Love

Eat

↳ 1yr + fine

people intercourse or by watching under

Under 354(c) I.P.C

1<sup>st</sup> offence  $\Rightarrow$  1-3 yr (cognizable bailable)

2<sup>nd</sup> offence  $\Rightarrow$  3-7 yr (cognizable Non-bailable)

TRANSVESTISM / EONISM  
II II  
Cross Dressing



- Individual identity himself as opposite gender
- Not perversion - Gender Misidentity disorder

Mc in ♂.

Sec. 497 : Adultery (i.e. voluntary sexual intercourse b/w a Married Person &  
Sec 498(A) : cruelty after marriage ; Manted or Not ; other than his/her spouse).  
L Not on ♂.

Q: ♀  $\rightarrow$  4 yrs under marriage  $\rightarrow$  ♀ Autopsy ?

① 304 B I.P.C

③ 174 M.P.C

② 302 I.P.C

④ 176 M.P.C



Q: Power to Recall a witness ?  
Under Cr.P.C (321)

Q: Evidence Recorded in Lower court ; is applicable in higher court ?  
Under I.E.A. (33)



Juvenile; child; Minor  $\Rightarrow$   $< 18$  yr.

Juvenile in crime  $\Rightarrow$

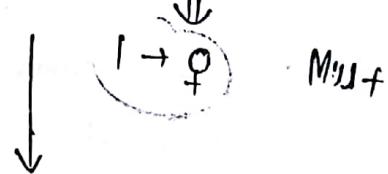
Juvenile - In-conflict w/Law (JCL)

That Means any Juvenile offender  
juvenile delinquent. He is called  
"JCL" & is never sentenced to  
death/imprisonment.



Juvenile Justice Board

- ① 1st class judicial Magistrate  $\Rightarrow$  Principle Magistrate (♂ or ♀)
- ② 2 NGO Member



Reformatory / BORSTAL

Age upto 21 yrs Maxm

Maxm Punishment  $\rightarrow$  3 yrs.

- Amended 2015:  $\Rightarrow$  Maxm Punishment  $\Rightarrow$  Death Sentence

Age of Juvenile depends upon crime committed,  
depends upon

Age	Crime
$< 18$ yrs	① Petty
$< 18$ yrs	② Serious
$< 16$ yrs	③ Heinous

Petty Crime Punishment  $\Rightarrow$   $\leq 3$  yr - e.g. 3 yrs

Severe  $\Rightarrow$  3 yr - 7 yr - e.g. 3 yrs, 4 yrs

Heinous  $\Rightarrow$   $\geq 7$  yr



Brain Stem death

• Definition ⇒ Section 2(9) :

• Criteria ⇒ Minnesota

Team of DOCTORS ↗

Hospital in charge (HIC) :

(2) Specialist appointed by  
HIC :

(3) Independent Neurologist / Neurosurgeon

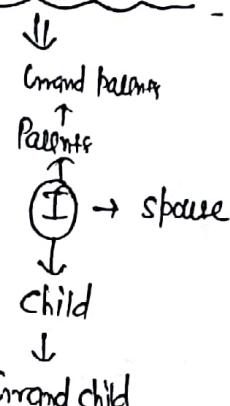
(4) Treating Doctor

All are Not part of operating  
Team

Live individual

↓  
Donate diff Money Mainly.

NEXT OF KIN

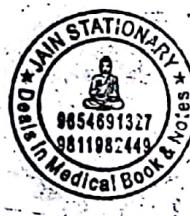
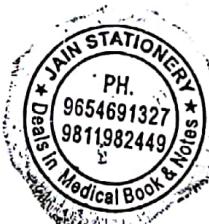


Punishment ⇒ to Doctor

10 yr + 20 Lac to 1 crore

MCI can Remove for 3 yr → 1st offence

Permanent → 2nd offence



### INDIAN LUNACY ACT, 1912

- Replaced by Mental Health Act 1987

- Replaced by Mental Health Care Act, 2017

- (1) ECT → pre-treated ≡ Muscle Relaxant.

ECT in child → Permission from Medical Review Board (MRB)

- (2) Advance directions are allowed for a future Medical illness

↓  
override ⇒ MRB

## Medical Review Board

People in MRB

⇒ ① District Judge

② Representative of District Collector,

③ 2 Doctor      Psychiatrist

Any Registered Practitioner

④ 2 People from NGO

If Doctor violated this Law

↳ Punishment ⇒ 6 month ± 10,000 - 1st offence

2 yr ± 50,000 - 5 lac - 2nd offence

## Consumer Protection Act, 1987

can file the case at

① District forum;

② State commission;

③ National commission;

National commission

5 Member

## District Forum

3 Member

Jurisdiction

Care value upto < 20 lakh

## State Commission

3 Member

20 lakh - 1 crore

> 1 crore

Not happy



State Not happy



National Not happy

↓  
Go to Supreme Court

- case decided in 90 days.
- ~~Ex:~~ After decision appeal in 30 days.



CORPUS DELICTI — Body of offense / essence of crime

### IDENTIFICATION

(I) DETERMINE SPECIES → Precipitin test  
↳ Species identification test.

(II) DETERMINE RACE → (A) SKULL :

CEPHALIC INDEX →

Maximum Breadth of Skull

X100

Maximum Length of skull

short-headed

Long-headed  
DOLICOCEPHALIC

MESATICEPHALIC

Brachycephalic

Cephalic index → 70 - 79 %.

75 - 80 %

80 - 85 %

e.g. ⇒ Pure Aryans;  
Negro

Indian

Mongoid

(B) DEFINITION ⇒ Mongoid ⇒ i) Gano dentism (Bull tooth);  
ii) shovel shape incisor  
iii) Absent 3rd Molar  
iv) Enamel pearls



ii) Carabelli's cusp

↳ extra cusp on Maxillary 1<sup>st</sup> Molar

- Negro → i) Large teeth  
ii) Multiple cusp.



(III) DETERMINE GENDER → Best from Pelvis

Pelvis → 95% (Best)

Skull → 90%.

Long bones → 80%.

Pelvis + skull → 98%.

All bones → 100%.

Sternum

i) ASHLEY'S RULE ⇒



Manubrium + Body

$\geq 149 \text{ mm}$

♂

$\leq 136 \text{ mm}$

♀

ii) Sternal index ⇒

Manubrium  
Body

♀

$0.54$

♂

$0.46$

(IV)

DETERMINE STATURE ⇒ Stature ⇒ Bony Length of Individual.

Length of bone is Measured by ⇒ "Hobson's Osteometric Board"

Length of bone × M.F ⇒ Stature



FEMUR  $\Rightarrow$  3.6

This Multiplication factor

TIBIA  $\Rightarrow$  4.4

is known as "KARL PEARSON COEFFICIENT".

FIBULA  $\Rightarrow$  4.4 \* Bone

1. of Height

HUMERUS  $\Rightarrow$  5.3 \* Humerus

$\Rightarrow$  20

ULNA  $\Rightarrow$  6 \* Tibia

$\Rightarrow$  22

RADIUS  $\Rightarrow$  6.4 \* Femur

$\Rightarrow$  27

\* Spine

$\Rightarrow$  35

→ 2nd Method to determine status  $\Rightarrow$  "Trotter & Glaser Method"

Discovered by  $\Rightarrow$  Sir William Herschel / Sir Francis Galton

DNA Fingerprinting Discovered by  $\Rightarrow$  Sir Alec Jeffreys

(I)

Finger printing

Dactylography

Dermatoglyphy

(N) Routine F/P  $\Rightarrow$  Better than digital F/P

↳ even different in identical twins

↓

Guenther's Rule

Loops

Whorls

Arches

Composite

↓

↓

↓

↓

67%

25%

6-7%

1-2%

M/C

• 2 sets of F/P Need to identify.

• 8 points should Match in India; varies w.r.t. country

↳ No Matter complete / Partial F/P.

• Little finger print - Both - ~~Not taken~~

• Dermis - depth - 0.6mm



Irradiation &  
electrical injury.

- CALLIGRAPHY → Study of Hand writing,
- POROSCOPY → Study of pores on epidermal Ridges
- Primarily used in partial finger print
- Developed by "LO CARD EXCHANGE PRINCIPLE"

• PALATOPRINT → Taken from Ant. 1/3rd of Palate

↳ Rugoscopy

• CHEILOSCOPY → Lip prints

• Tsuchi hashi classification

↳ 6 types

• ANTHROMETRY → By "BERTILLON SYSTEM"  
↳ II  
II

Body Measurement,

↳ Mostly axial / L+ side except → one from R+ ear

• Only in Adults (Not for child)

• No biological specimen Required

• earliest criminal identification system.

• SUPERIMPOSITION TECHNIQUE → Skull bone

↳ Re-test is said better in this technique

• IDENTIFICATION BY AGE → ① By secondary sexual character

② By dentition

③ By ossification centre



## 2<sup>o</sup> sexual character

- Tanner's sexual Maturity Rating

↓

Gn Pediatrics

## Ossification centre

By definition

- 18+ to ossify

↳ clavicle (5<sup>th</sup> week gvl)

- 2<sup>nd</sup> Mandible  $\Rightarrow$  6<sup>th</sup> week gvl

- Calcaneum - 5<sup>th</sup> week of gvl

- Talus - 7<sup>th</sup> week of gvl

- Lower end of Femur - 9<sup>th</sup> week of gvl / just before birth

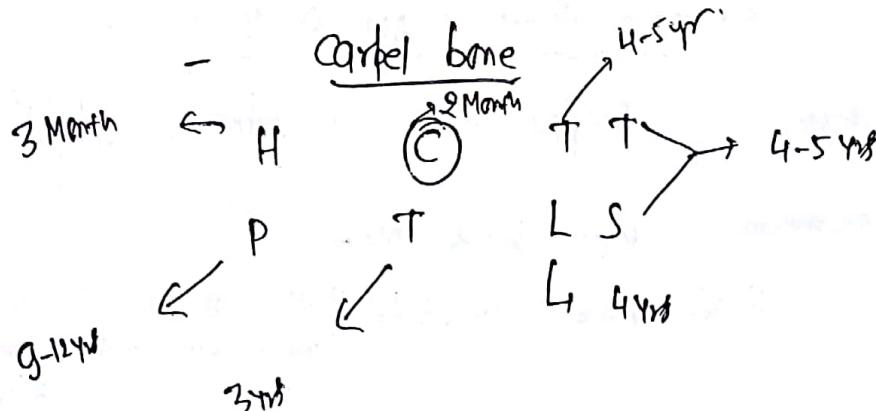
## Ossification centre @ birth

- Cuboid
- 4<sup>th</sup> part of body of sternum
- Upper end of tibia

## Ossification centre @ 1yr

- Head of humerus / Femur

- Lower end tibia / Fibula
- Capitulum





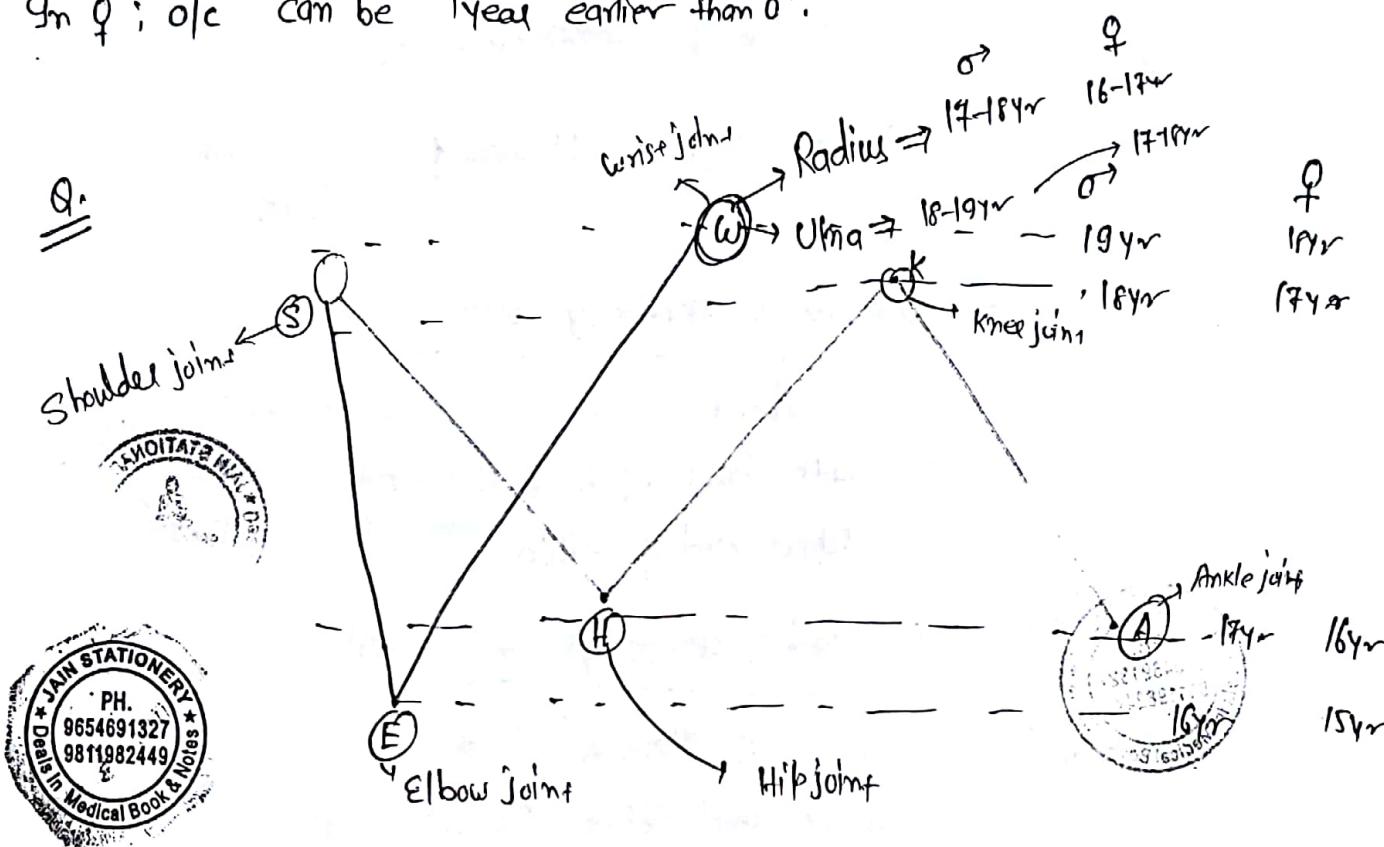
♂  
ILIAC CREST  $\Rightarrow$  (A)  $\Rightarrow$  14 yr  
(F)  $\Rightarrow$  18-20 yr

♀  
13 yr  
17-19 yr

ISCHEAL TUBEROSITY  $\Rightarrow$  (A)  $\Rightarrow$  16 yr  
(F)  $\Rightarrow$  20-21 yr

15 yr  
19-20 yr

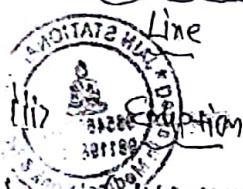
In ♀ : o/c can be 1 year earlier than ♂.



### DETERMINATION OF AGE BY DENTITION

i) Sturz's Method  $\Rightarrow$  Cut/Half tooth  $\Rightarrow$  9 months (Age of infants can be known from height & weight of erupting teeth)

ii) Boyd's incremental  $\Rightarrow$  Kla "Boyd's Method".



↳ Body's enamel: In children there is a line @ birth on enamel of tooth; with age more lines are added.

iv) Rutherford's Method  $\Rightarrow$  Determined age  $>$  21 yrs.

Temporary → I C PM  
2 1 0 2 = 20

Permanent → 2 1 2 3 = 32 total

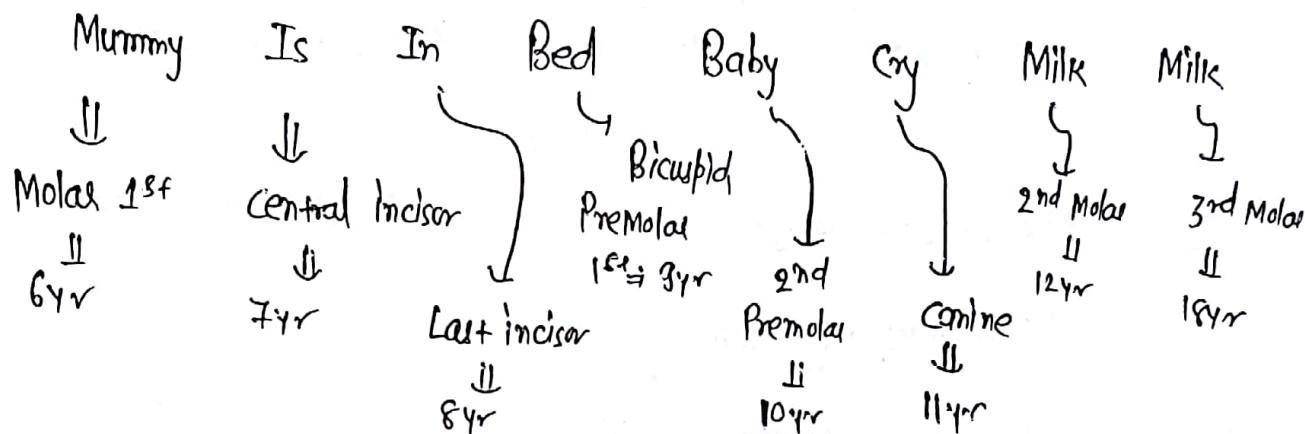
1<sup>st</sup> temporary tooth to appear - Lower central Incisor

Last temporary tooth to appear = 2nd Molar.

1<sup>st</sup> Permanent tooth to appear - Molar  
4 6 yr



Permanent dentition ⇒



Mixed Dentition (6-12 yr) ⇒ Both Temporary + Permanent

30 months ( $2\frac{1}{2}$  yr) ⇒ teeth = 20 in No.

(@) 6 yrs + 4 ⇒ teeth = 24 in No.

(1<sup>st</sup> Molar)  
(@) 12 yr + 4 ⇒ teeth = 28 in No.

(2<sup>nd</sup> Molar)  
(@) 18 yr + 4 ⇒ teeth = 32 in No.

(3<sup>rd</sup> Molar)

\* No. of Permanent teeth ⇒  $(Age - 5) \times 4$  1<sup>st</sup> apply

If any. Not comes from this; then apply  
 $(Age - 6) \times 4$  2<sup>nd</sup> apply



\* GIUSTAFSON METHOD  $\Rightarrow$  Used in  $> 25$  yr age

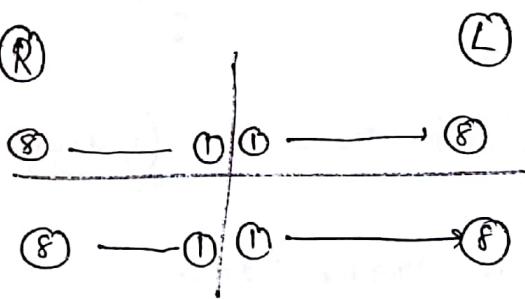
- i) Attrition : Top part (Grinding part)
  - ii) Parodontosis : Recession of gingiva;
  - iii) GO Dentine : 2nd Most Reliable parameter ; Full Cavity Material
  - iv) Cementum opposition : Root part
  - v) Root Resorption : Least Reliable Parameter
  - vi) Root Transparency : Most Reliable Parameter
- Anterior teeth  $\gg$  Posterior teeth for determination  
( I/Lc  $\gg$  P/M ).

### DENTAL NOTATION METHOD

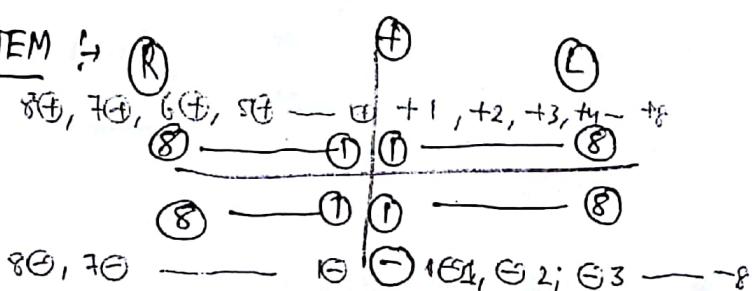
#### I. UNIVERSAL SYSTEM

#### II. DIAGRAMMATIC SYSTEM

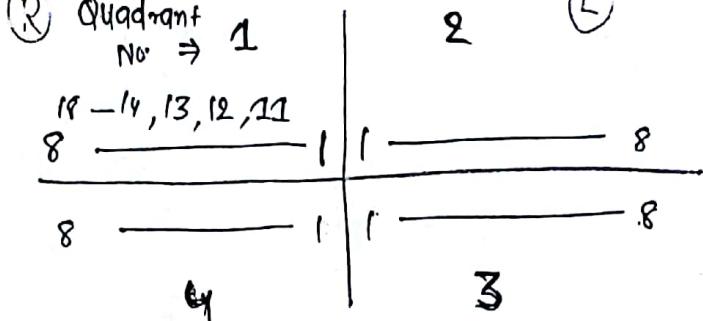
#### III. PALMER'S SYSTEM $\Rightarrow$ R L



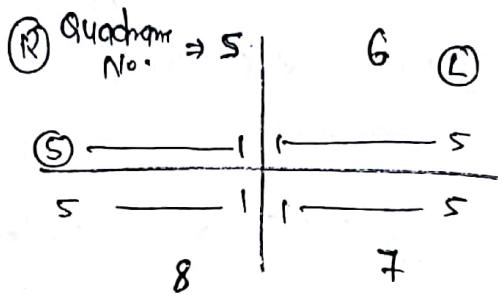
#### IV. HADERNUP SYSTEM $\Rightarrow$ R L



#### V. FDI SYSTEM (Federation Dentale International) $\Rightarrow$ 2 digit Notation



Used for Permanent Dentition

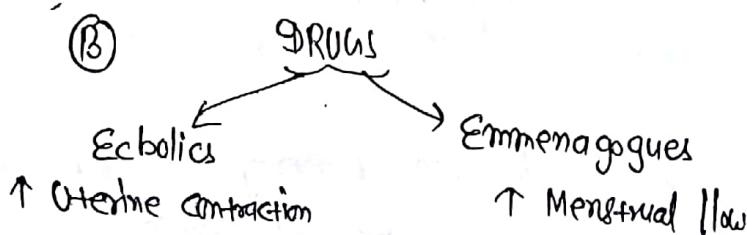


Temporary dentition

- \* Miles Method  $\Rightarrow$  Age can be known by change of Root transparency.
- \* METHOD OF CRIMINAL ABORTION  $\Rightarrow$

(A) Abortion Stick  $\Rightarrow$  Gnitant plant calotropis  
 $\Downarrow$

Reflux Uterine contraction



(C) M/c complication of Criminal Abortion  $\Rightarrow$  Hemorrhage

M/c immediate cause of death  $\Rightarrow$  Shock

M/c delayed cause of death  $\Rightarrow$  sepsis

416 Cr.P.C  $\Rightarrow$  Commutation of death Sentence of ♀ Lady.

\* If a ♀ Lady; she can't be hanged during/ after delivery.

III

Death sentence will automatically change to Life Imprisonment for that offence

- ♀
- Wide outlet
  - Shallow cavity
  - wide outlet
    - ↳ Sub-pubic Angle obturator
    - ↳ Ischial tuberosity are elevated
  - Chilotic Line
    - ↳ Pelvic component > Sciatic component
  - Coccyx  $\Rightarrow$  More Movable
  - Preauricular  $\Rightarrow$  More; frequent, broad Sulcus
    - & deep
- Chilotic Line
- Heart shaped outlet
  - Deep cavity
  - Narrow outlet
    - ↳ Anteverted Imverted.
  - Sciatic component > Pelvic component.
  - Less Movable
  - Not frequent; Narrow; shallow
- Attachment of Anterior Sacroiliac Ligament.
- gleno-humeral  $\Rightarrow$  Rounded & Smooth Line
    - well Marked & Rough

\* Stature (Body Length) is More in  $\Rightarrow$  ① Lying;

$\Downarrow$

Relaxation of Large joints;



② After death & / or Loss of Muscle tone;

\* Stature is less in  $\Rightarrow$  ① Afternoon & evening & / or elasticity of intervertebral disc & longitudinal vertebral Muscle;

② Both Malnutrition & Advancing age

\* 1st ever finger print Bureau in the world  $\Rightarrow$  Calcutta

\* Types of Fingerprinting :
 

- 1. Latent  $\Rightarrow$  which can't be seen by Naked eye;

2. Visible  $\Rightarrow$  Can be seen by Naked eye;

3. Plastic  $\Rightarrow$  type of visible finger print which is seen in plastic substance (like wax etc.)

4. Chance  $\Rightarrow$  Not a type of finger print; used for crime investigation.

\* In child: Foot print is taken  $\Rightarrow$  develops by 12-16 wk of GUI.

Commonly used dyes  $\Rightarrow$

Indian ink; Ursin blue; Vermilion;  
carbon; Indigo; cobalt.

- Tattoo Mark is permanent

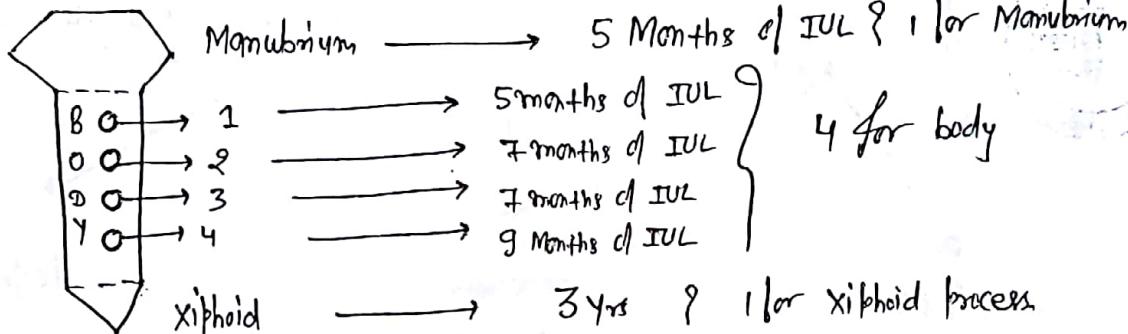
↳ When dyes penetrate the dermis.

AI+II Infrared photo-graphy makes old tattoo readily visible

(NEET'16) A faded tattoo mark become visible by use of ultraviolet lamp;

(AI'91) Marks are recognized even in the decomposed bodies; when the epidermis is removed

#### \* Sternum ossification centre



\* Manubrium fusion  $\cong$  Body : 60-70 yrs.

\* Xiphoid fusion  $\cong$  Body : 40 yrs

\* 14 yr  $\rightarrow$  25 yr.  $\Rightarrow$  Lower to upper body fusion  
(Started) (complete)

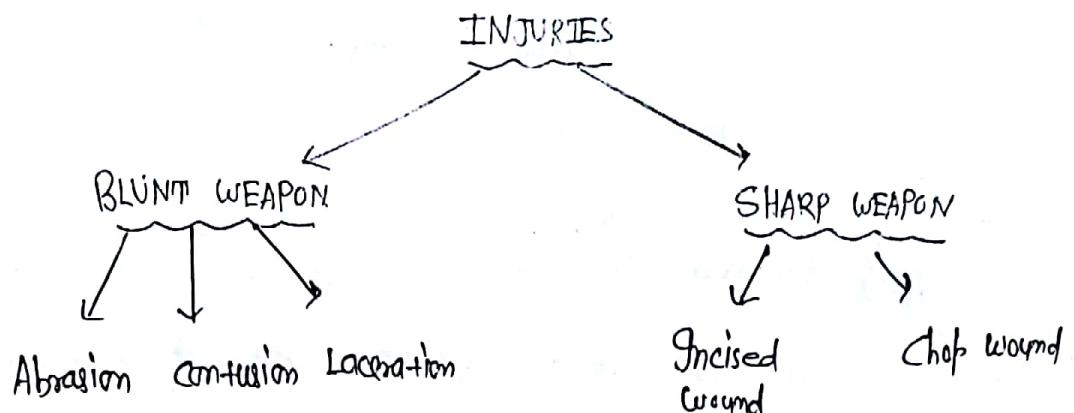


* Temporary tooth Eruption		12-14M	20-30M
7-9M	7-9M		
I	I	C	M
I	I	C	M
6-7m	10-12m	17-20m	19-24M

\* "Super added permanent teeth"  $\Rightarrow$  6 permanent molars; which erupt extra in each jaw clout replacing any teeth.

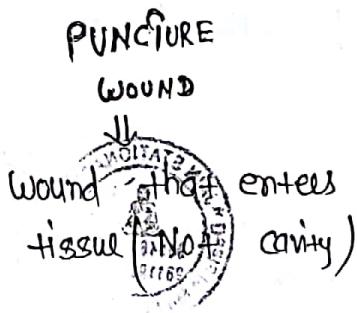
\* Successional permanent teeth  $\Rightarrow$  All other permanent teeth except superadded permanent teeth.

\* In both, deciduous & permanent teeth, dentition occurs earlier in the lower jaw except  $\Rightarrow$



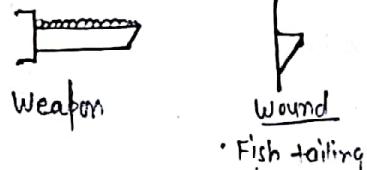
Stab wound  $\Rightarrow$  Depth  $>$  length or breadth of wound

- ↳ An imm. injection should be stab wound
- ↳ but if it enters tissue Not<sub>m</sub> cavity  $\Rightarrow$  so "Puncture wound"



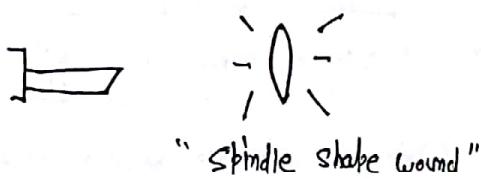
Single edge wound  $\Rightarrow$  causes "Fish tailing" wound

- one edge blunt
- one edge sharp.



Double edge wound  $\Rightarrow$  causes "spindle shaped wound"

- Both edges are sharp



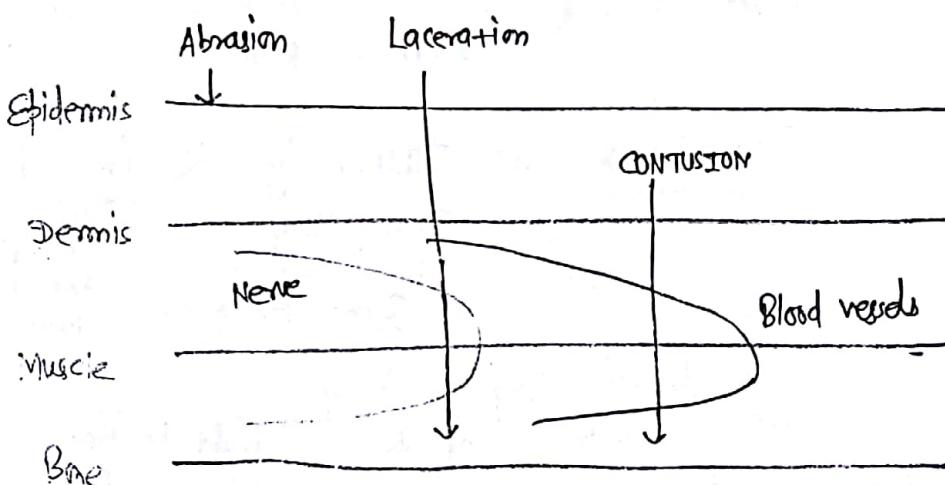
- Length → Depth of the wound  
width → Length of the wound  
Thickness → Breadth of the wound

### HARA KIRI

- Japanese Method of Suicide
- Honourable death
- Transverse cut over abdomen
- Cause of death ⇒ Shock & Hemorrhage



### INJURIES - By Blunt Weapon



A11B

Shape of stab wound depends upon

- (a) Edge of weapon;
- (b) Shape of weapon;
- (c) Width of weapon.

#### • ABRASION

epidermis alone damaged.

#### • LACERATION

epidermis along with all underlying tissues damaged.

#### • CONTUSION

epidermis intact; but only deeper

Blood vessels → Not damaged → No bleeding

Lymph → Scab

↓  
Age of Abrasion

1-3 days → Reddish Brown

1 week → Heals



Anywhere in body Newer Crudeous Hurt; except → corner  
↳ b/c it heals by itself.

TYPE OF ABRASION ⇒ 1. SCRATCH / LINEAR ABRASION :

2. GRAZE ABRASION : Multiple Lineal Mark



↳ Resulting in friction burn / Brush burn.

↳ Not getting separate Lineal Mark  
Seen in RTA



PRESSURE ABRASION :

Caused by Sustained pressure

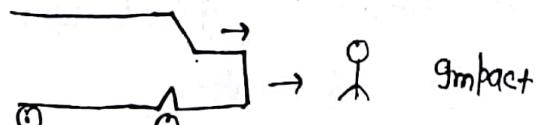
Eg ⇒ Hanging. ↳ if type of car for 1 min.

4. IMPACT / IMPRINT ABRASION : Seen in RTA then it cause sustained pressure.

↳ Something in Motion ;  
component of velocity should be there.

Pattern of object is seen ⇒ "Pattered Abrasion"

- Speeding car



Impact

- Speeding car breaks & stops on leg



Pressure

• gl. Mark is present;  
like "Tyre Mark"  
↓  
"Pattered abrasion"

- Ant bite mark
- Excreta
- Pressure sore.

Caused by trauma d/t Blunt object  
 (Fist; Lathi; Stick; Whip  
 boot etc)

CONTUSION / BRUISE

- Extravasation of blood in surrounding tissue  $\subset$  intact epithelium
- ECTOPIC BRUISE  $\Rightarrow$  Seen away from impact.



Racoon's sign



#  $\Rightarrow$  Anterior cranial fossa

contusion  $\Rightarrow$  Periorbital Region

Battle's sign



#  $\Rightarrow$  Middle cranial fossa

contusion  $\Rightarrow$  Mastoid

- Patterned Bruise  $\Rightarrow$  Pattern of the object as



TRAMLINE Bruise  $\Rightarrow$  Two pale line

SIX PENNY Bruise  $\Rightarrow$  contusion Resembling the finger tips of the Mulderer.

e.g.  $\Rightarrow$  Throttling.

Tyre Mark  $\Rightarrow$  can cause Patterned Bruise



Ans  $\Rightarrow$  Scalp.

### Age of Bruise

- 1-2 hrs  $\Rightarrow$  Red  $\Rightarrow$  dI + OxyHb
- 3 hr. - 3 days  $\Rightarrow$  Blue  $\Rightarrow$  dI + Deoxy Hb
- 4<sup>th</sup> day  $\Rightarrow$  Bluish black  $\Rightarrow$  dI + Hemosiderin
- 5-6 days  $\Rightarrow$  Greenish  $\Rightarrow$  dI + Hemoroidin
- 7-12 days  $\Rightarrow$  Yellow  $\Rightarrow$  dI + bilirubin
- 2 wks  $\Rightarrow$  Normal

"Eye" (Subconjunctival Hemorrhage) doesn't show colour change



b'coz dI + Sufficient O<sub>2</sub>; OxyHb never converts into DeoxyHb

### LACERATION

Blunt weapon

Margins Irregular



Hemorrhage

### GNCISED WOUND

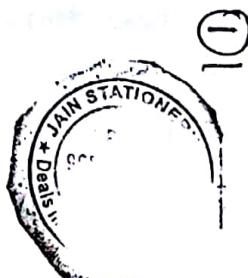
Sharp weapon

Margins Regular



Tissue Bridge  $\Rightarrow$   $\oplus$

$\hookrightarrow$  Gm+act fibres & Neaves



Appeal incised; but actually Lacerated,

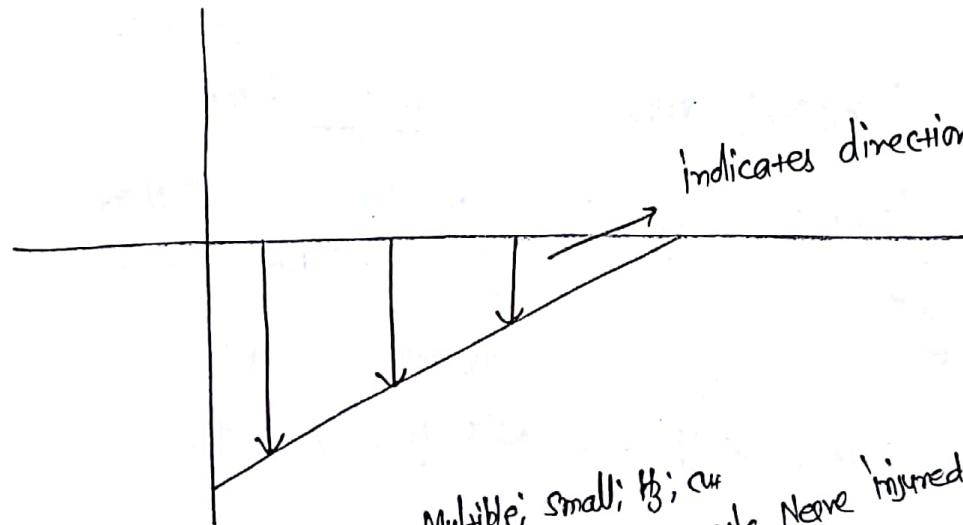
(eg: Jaw | tibia | etc ..)

- LACERATED LOOKING INCISED WOUND  $\Rightarrow$  At Scrotum; Axilla

Appeal Lacerated; but actually Incised

- In Lacerated wound  $\Rightarrow$  Swallow tails (Y)

- TAILING OF INCISED WOUND  $\Rightarrow$



Indicates direction of wound

- Hesitation | Tentative cuts  $\Rightarrow$  Suicide | Rt. handed  $\rightarrow$  Left sided cuts

Multiple; small; Hg; cut  
M/C Nerve injured  $\Rightarrow$  Medium N.

- Defence wounds  $\Rightarrow$  Indicate Homicide

Opposite to dominant side

- FLAYING | Homicidal in Nature  
Seen in "extensor surface of forearm on Ulnar side"  
Avulsion Laceration  $\Rightarrow$  Complete Separation of skin

II  
Skin goes  $\infty$  Type of case

Type of Avulsion (Shearing Laceration); In which shearing & grinding force by weight produces.

- ② helps to know the time since injury,
- ③ indicates the amount of force applied,
- ④ direction can't be assessed.

NEET'16

Q.\* In Penetrating Abdominal trauma d/t stab wound; the M/c injured organ →

① Liver;	② Small Bowel;	③ Diaphragm;	④ Colon
↓ 40%	↓ 30%	↓ 20%	↓ 15%



### SKULL #

Frontal & Parietal bone  $\Rightarrow$  6-10mm  
Occipital bone  $\Rightarrow$  15mm

Temporal bone - Thinnest bone

Contact Scalp  $\Rightarrow$   $400 - \frac{600}{4} \text{ psi} \Rightarrow 65 \text{ N/m}$   
 $\text{or}$  Panel square inch

Force

Requires  
#

Clout Scalp  $\Rightarrow$  25 psi

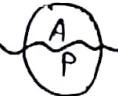
### Types of Skull #

1. Linear or Fissure # | Polar #  $\Rightarrow$  M/c type of # (skull)
2. Depressed # | Signature #  $\Rightarrow$  2nd M/c type of # (skull)
3. Pond's # | Indented #  $\Rightarrow$  Seen in gunshots.  
↳ Looks like "Ping-pong ball"  $\Rightarrow$  so known as "Ping-pong #".
4. Gutter # | Bullet injuries

6. Diaستatic sutural # ⇒ Common in Young Adult

↳ M/c suture to separate ⇒ Sagittal Suture

7. Motorcyclist # / Hinge # ⇒ Involves Base of skull



8. Ring # ⇒ Seen in Fall from height  
↳ # along foramen magnum

9. Bursting # ⇒ Occurs some distance away from site of impact

V.V.G.  
Skull # Heals clout visible callus.

### Extradural hemorrhage

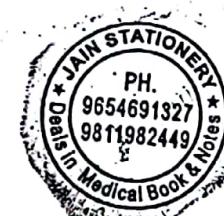
- Always traumatic
- In lucid interval; the person can:
  - (a) Make a valid will;
  - (b) can give valid evidence;
  - (c) is legally responsible for Act done (civil or criminal).
- Middle Meningeal Artery
- 100 ml of loss is fatal

- Lucid interval. can be present

↳ Period of Normal b/w two Insane

- Direct hemorrhage seen in EDH
- M/c site ⇒ Parieto-occipital Region
- M/c cause of death ⇒ Respiratory Failure

↳ also seen in ⇒ (a) Insanity; (b) Subacute / chronic epidural hemorrhage (EDH).

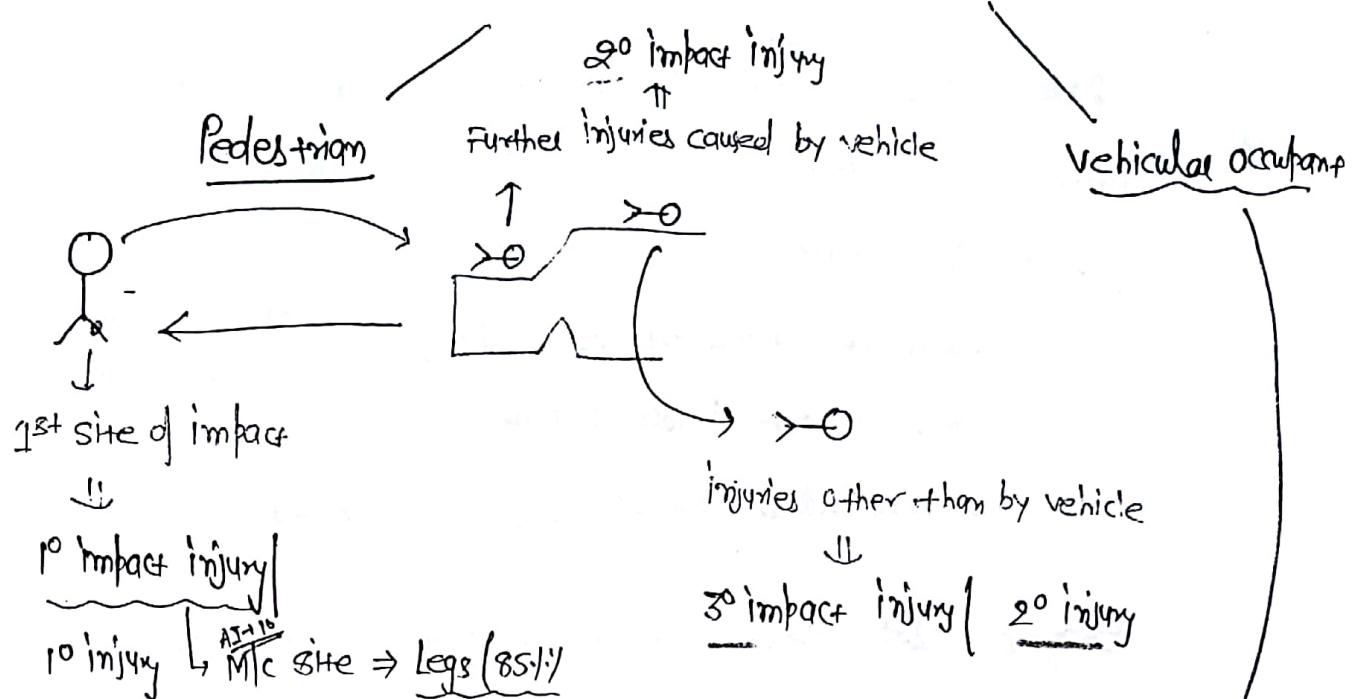




## SUBDURAL HEMORRHAGE

- Traumatic / Spontaneous
- M/c cause - Damage to Bridging vein  
↳ Running from cerebral cortex to sphenoid sinuses
- seen in Boxer; called as "Punch drunk hemorrhage"
  - ↳ but different from "Boxer hemorrhage"
  - ↳ Pontine Hemorrhage
- Kernighan's Notch  $\Rightarrow$  U/L grooving of cerebral peduncle
- Dure's Hemorrhage  $\Rightarrow$  Hemorrhage in Mid brain & pons.
- Plaques jaune  $\Rightarrow$  old cortical contusion after head.
- Coup injury  $\Rightarrow$  Injury @ the site of impact.
  - Counter coup injury  $\Rightarrow$  away from the site of impact  
↳ Uncommon in occipital Region
- Stationary head causes only Coup injury; but Mobile head can cause both

- Death claim 30 days of Accident is attributed to RTA.



Whiplash injury  $\Rightarrow$  Hyperflexion b/b Hyperextension

Hyperextension ||| Hyperflexion. (M/c)

↳ More dangerous

↳ Stationary car hits by behind Moving car

- No damage to vertebral bodies.
- Spinal cord damaged  $\in$  Anterior Longitudinal Ligament damage.

Windshield glass injury  $\Rightarrow$  "Snowball effect Appearance"

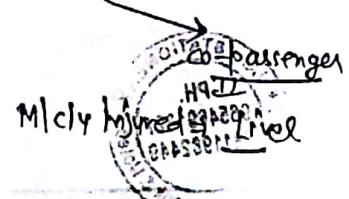
↳ causing Multiple Laceration on face d/t impact of face  
 $\in$  glass & piece of glass

Seat belt Syndrome  $\Rightarrow$  M/c involved organ  $\Rightarrow$  Mesentery



On Driver  
 $\Rightarrow$  M/cy injured  $\Rightarrow$  Spleen

If Not in option



## Impact into heavy vehicle

Q. RTA - 2 bodies found outside vehicle. From which of the following finding we can't differentiate b/w a driver & a co-passenger?

1. Whiplash injuries

2. Sparrow leg appearance  $\Rightarrow$  Passenger

3. Lineal abrasion of left shoulder  $\Rightarrow$  co-passenger

4. Steering wheel impact injury  $\Rightarrow$  Driver

Q. Enzyme 1st elevated in tissue injury  $\Rightarrow$  Cathepsin

Q. Laddered tear seen in usually  $\Rightarrow$  Driver.

Q. Rolling injuries mainly by  $\Rightarrow$  hit by a vehicle of low chassis.

Q. Diffuse axonal injuries may show  $\Rightarrow$  Retraction bands;

Retrograde Amnesia;

Immediate loss of consciousness

Q. A pedestrian is hit by a car resulting in fracture of tibia. The Autopsy surgeon says that he is able to determine the direction of impact by the apex of fracture. The apex of fracture of tibia is?

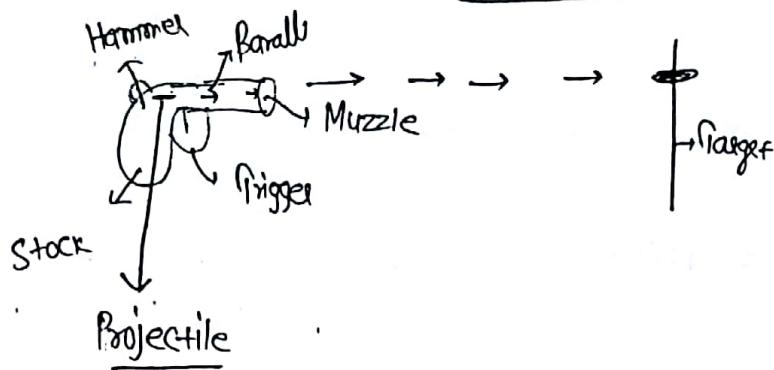
a. Opposite of direction of impact;

b. Along the direction of impact;

c. Perpendicular to the direction of impact;

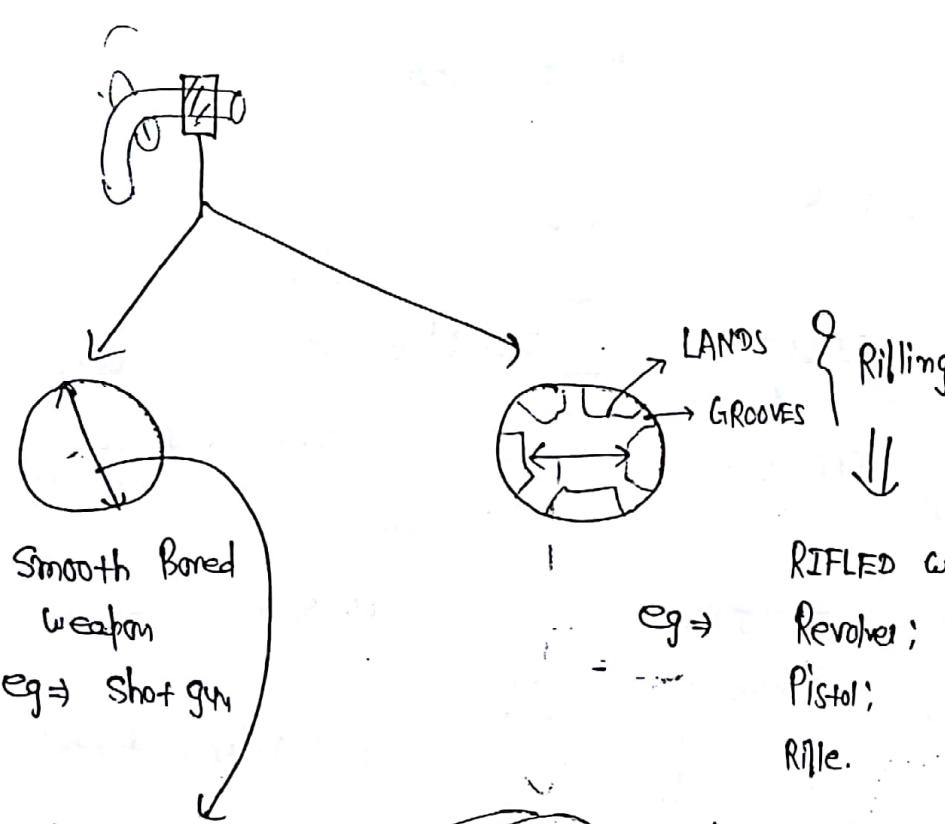
d. Not related to direction of impact.





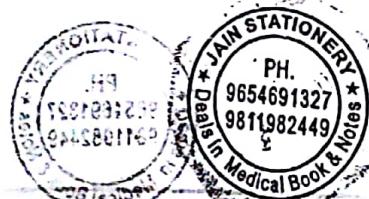
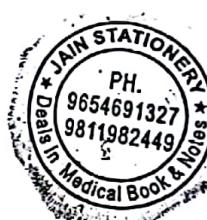
When it is in  
the Barrell

Internal Ballistics      External Ballistics /  
Intermediate Ballistics      Terminal /  
Wound Ballistics



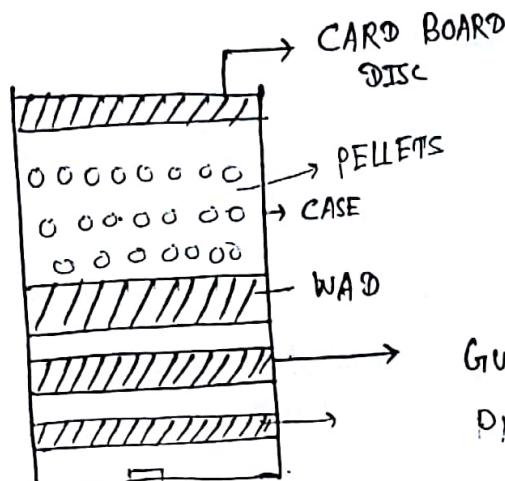
GAUGE  
||  
Internal Measure of  
a shotgun

CALIBRE  $\Rightarrow$  Distance b/w 2 Lands  
Internal Measure of a Riffled weapon.  
Measured by "Heliometer"



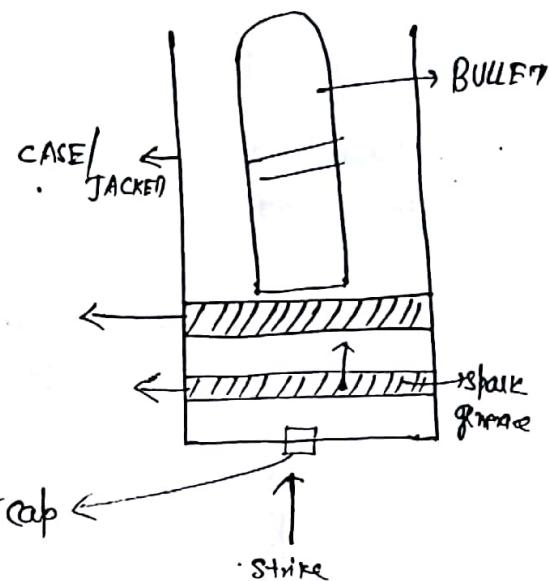
Shot gun

CARTRIDGE



Rifled weapon

BULLET



Gun powder

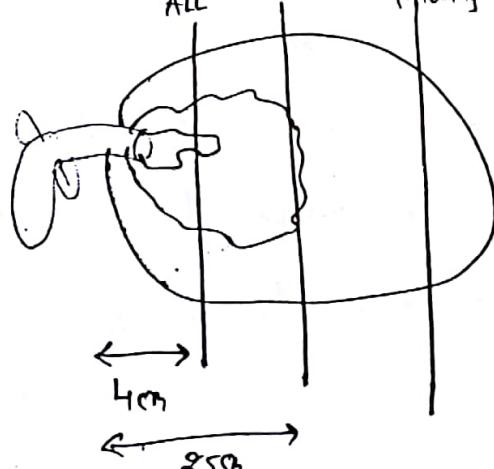
FLAME

SINGEING

SMOKE

BLACKENING

UNBURNED PARTICLES  
OF GUN POWDER



Shot gun

Seam Up to 15 cm

Rifled weapon

8 cm

30cm

60-90 cm

Nothing  
can be seen

S/B/T helps to determine →

① Dist. of pellet from Muzzle;

② Entry wound (Never seen @)  
Exit wound

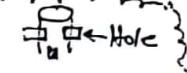


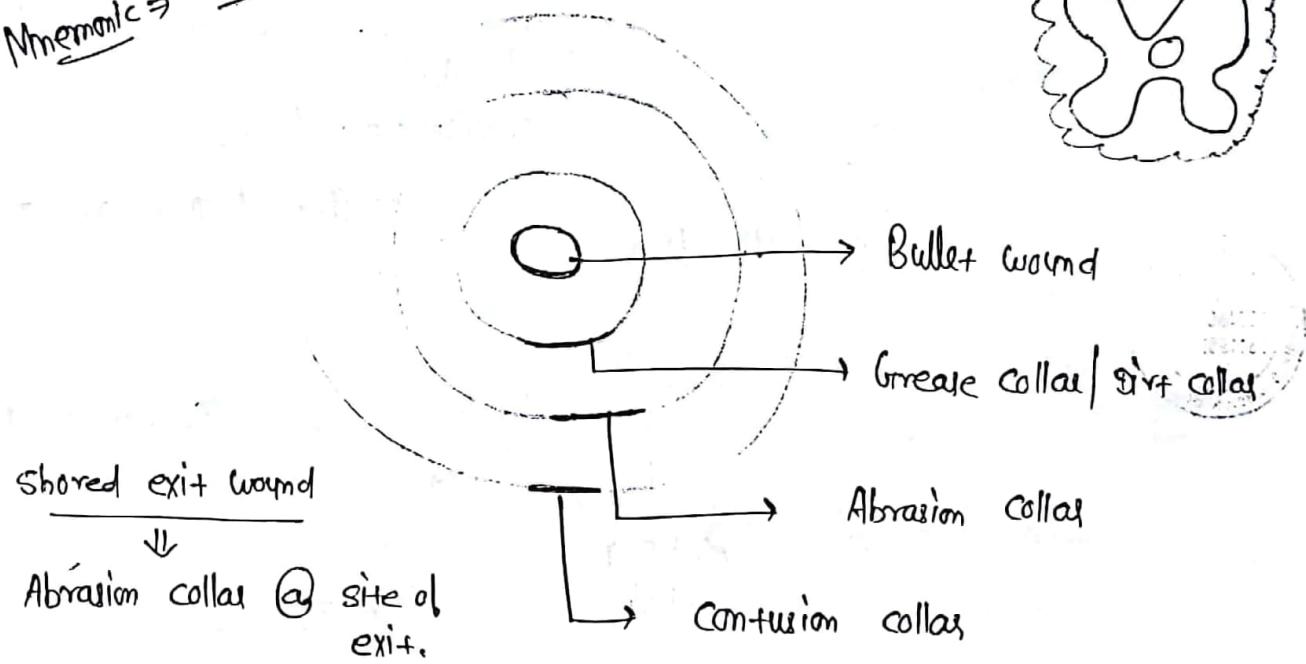
- ① S/B/T  $\Rightarrow$   $\oplus$   
 ② Cherry Red colour of tissue (dlt + Carboxy Hb)

→ dlt Gun Powder (so seen in both Riffled weapon & shotgun)

### Entry wound in RIFLED WEAPON

Mnemonic  $\Rightarrow$  CAGE

\* Military weapon  $\Rightarrow$  



### Entry wound dlt shotgun

#### Shape of wound

CONTACT SHOT  $\rightarrow$  cruciate / stellate shape 

CLOSE SHOT ( $< 30\text{cm}$ )  $\rightarrow$  oval shape 

NEAR SHOT ( $30\text{cm} - 1\text{m}$ )  $\rightarrow$  Rat hole shape 

$< 2\text{m}$   $\rightarrow$  wad

$< 4\text{m}$   $\rightarrow$  Satellite wound 

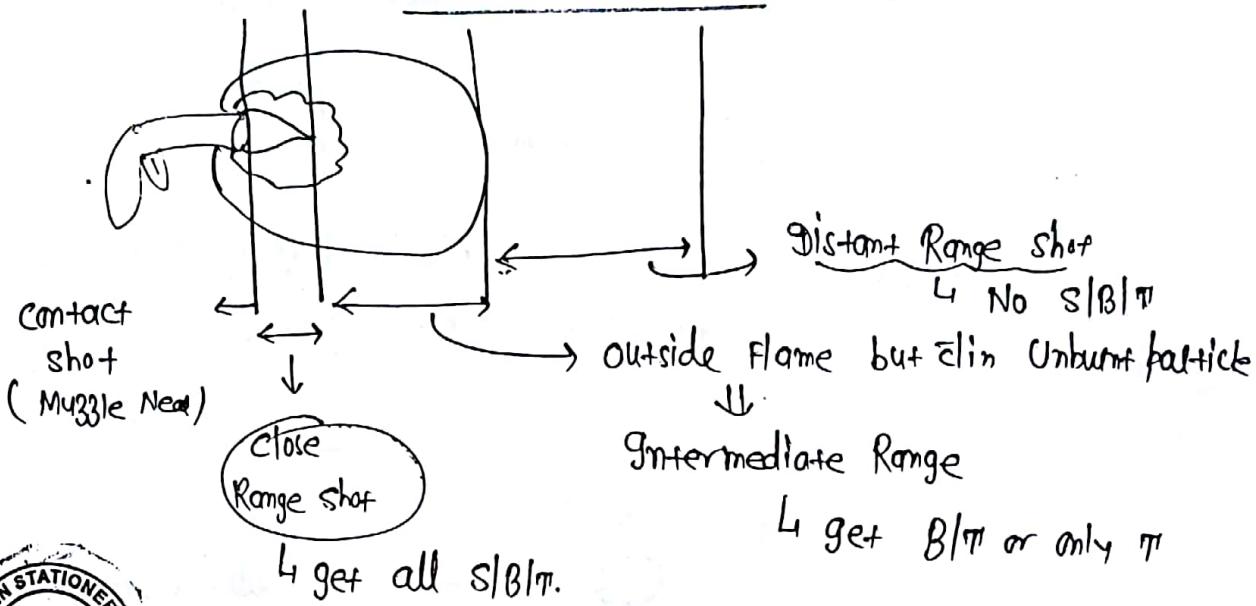
$> 4\text{m}$   $\rightarrow$  Individual bullet wound



BLACK SHOTTER

- ↳ Gases re-enter the Muzzle of weapon.
- \* S/B/T can also seen in contact shot (Loose contact shot)
  - ↳ Gases have space to come out.

### RANGE OF FIREARM



### PRIMER

⇒ Mnemonic ⇒ BAL

Barium

Nitrate

Antimony

Sulfide

Lead

Styphnate

### GUN POWDER

#### BLACK POWDER

$KNO_3 \Rightarrow 75\%$  (Supply  $O_2$  for burning)

C  $\Rightarrow 10\%$  (Density compound)

charcoal  $\Rightarrow 15\%$  (Fuel)

#### SMOKELESS POWDER

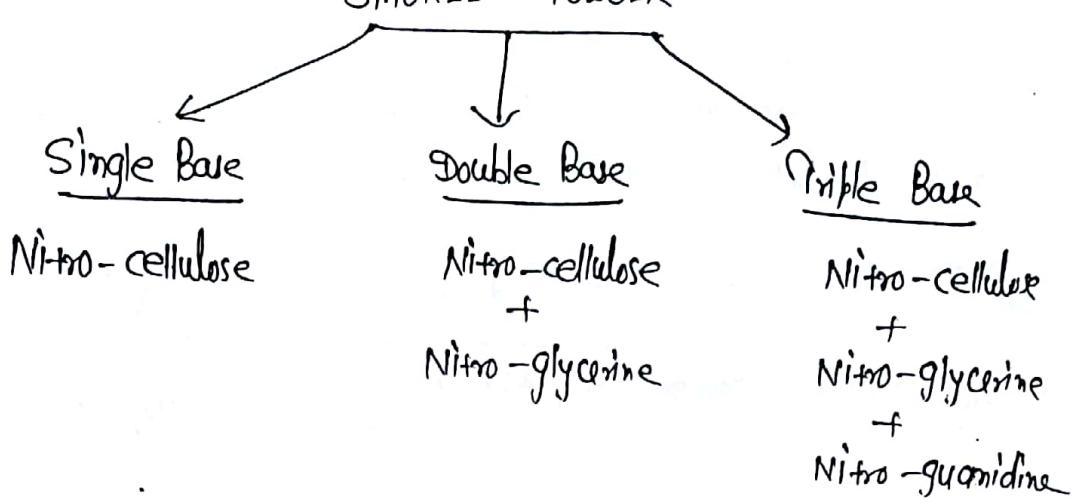
- Designated as Fg ; FFg ; FFFg etc



F<sub>T</sub>  
granules

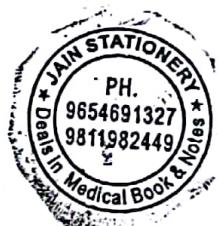
↳ Less No. of Unburnt  
particle ; Min<sup>n</sup> fuming ; Max<sup>m</sup> gas production

- Unm cc of each granule.



- produce 12000 - 13000 cc/gm
- it doesn't mean No gas / smoke; Amount of Blackening is less

Test - detect Recently fired FA



① Dermal Nitrate test / Paraffin wax test

↳ Useful for determining the Nitro group base

② Harrison & Gilroy test

↳ (BAL) Primer detection

③ Neutron Activation Analysis

?

↳ Any Metal detection

④ Atomic Absorption Spectroscopy (AAS);

⑤ Flameless AAS;

⑥ Scanning Electron Microscopy - Energy Dispersive X-ray  
(Best for)

↳ Not in option; Move upward from below



## LEAD (Made of)

May Combine Antimony to make it hard.

$$K.E. = \frac{1}{2}mv^2 \text{ (less velocity is preferable)}$$

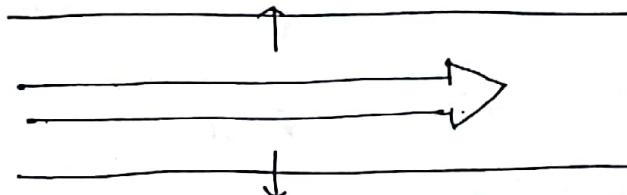
## Cavitation $\Leftrightarrow$

Lateral displacement of tissues by projectile

Seen in Rifle

passes into the tissue

$\rightarrow$  HVP  $\Rightarrow$  High Velocity Projectile



b/c the more the velocity  
More chance of cavitation.

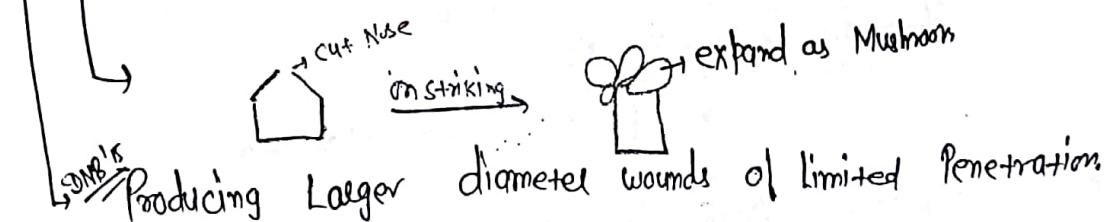


## TYPES OF BULLETS

### DUM-DUM BULLET $\Rightarrow$ expands on striking

cut @ Nose

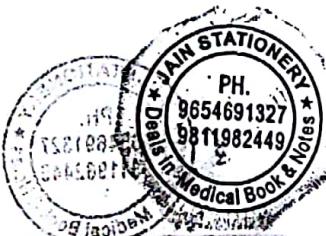
Banned b/c of Max<sup>m</sup> damage



### SOUVENIER BULLET $\Rightarrow$ left in body for Long time

Causes complication  $\Rightarrow$  Pb Poisoning

Also "Retained bullet"



(5) Tandem / Piggyback bullet  $\Rightarrow$  one behind other

4 Single entry by both  
Distant shot May cause two entry wounds.

(4) Incendiary Bullet  $\Rightarrow$  contain "Phosphorus"

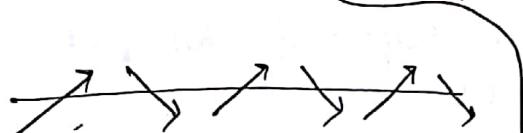
(5) Explosive Bullet  $\Rightarrow$  contain "Lead azide"

(6) Ricochet / Deflected Bullet  $\Rightarrow$

Bullet who stumbles (मुश्किल)  
along his axis



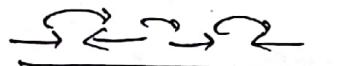
"Yawning Bullet"



Rotate around the axis



"Tumbling bullet"



Key hole entry

\* By Single bullet we can't tell about weapon correctly.





Manufacturer's Marking | class markings;

Individual Gun character /  
Specific Marking.

2<sup>o</sup> Markings are more specific about the weapon from which fire.

- Recovery of Bullet should always done by HANDS  
Never  $\infty$  blunt object

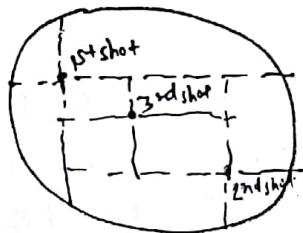
→ These markings are not seen in shot gun as it doesn't have Lugs & groove

## BULLET INJURIES TO SKULL

1. GUTTER'S #;

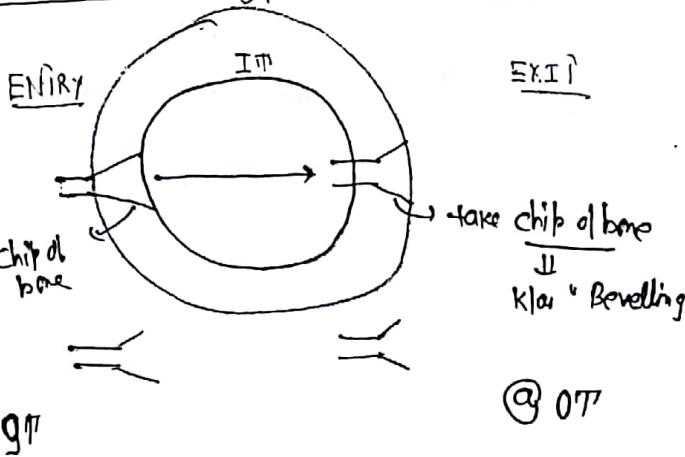
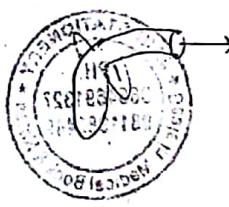
- ## 2. PUPPE'S RULE

↳ useful to know sequence of shots fired.



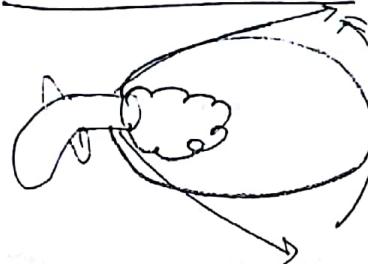
$\Rightarrow$  Newly formed # Lines never crossed previously  
# Lines,

3. BEVELLING OF SKULL  $\Rightarrow$  Chipping of skull.



7. KENNEDYS PHENOMENON  $\Rightarrow$  surgical artifacts that prevents distinguishing b/w Entry & Exit wound.
- $\hookrightarrow$  direction of line is assessed after knowing about Entry & Exit wound.

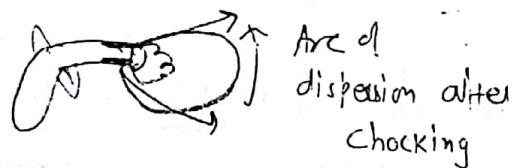
5. CHOKING OF SHOTGUN  $\Rightarrow$  Constriction of Muzzle End



Arc of dispersion

\* Choking Reduce the Dispersion. In Unchocked shotgun there is full dispersion of pellets.

Full choke  $\Rightarrow$  constriction of 1 mm



Arc of dispersion after choking

Half choke  $\Rightarrow$  constriction of 0.5 mm

Cylinder Bore  $\Rightarrow$  0 mm weapon

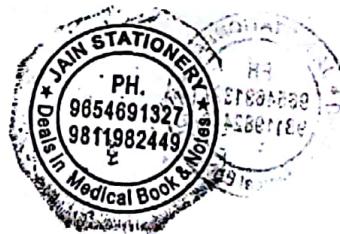
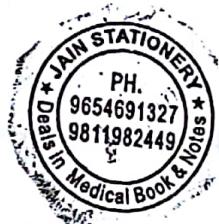
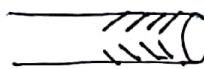
$$\text{Spread} = \text{Range} \times \frac{3}{2} \quad (\text{for cylinder bore weapon})$$

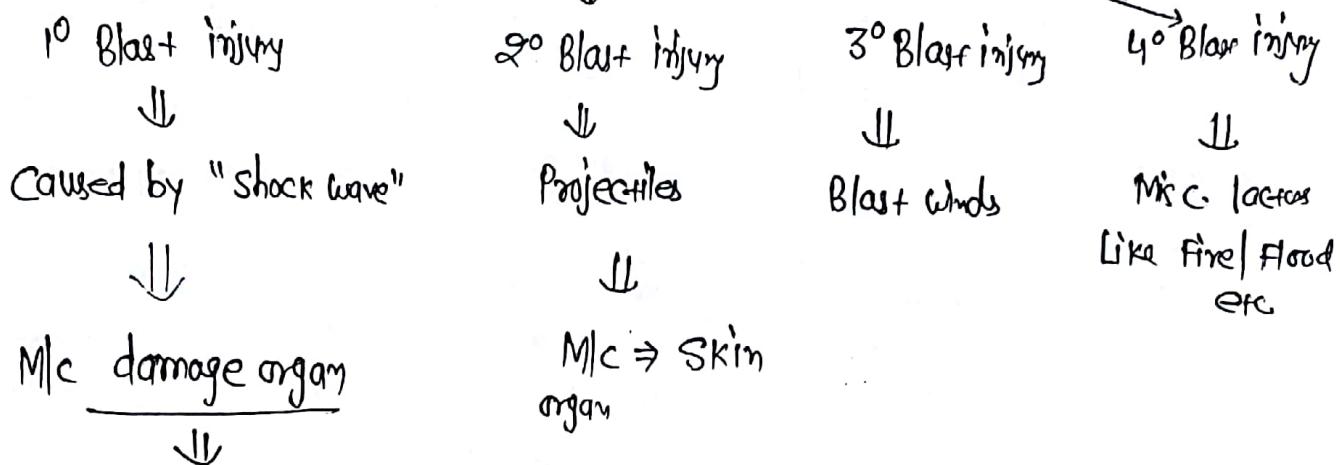
$$\text{Range} \times \frac{3}{3} \quad (\text{for half choke weapon})$$

$$\text{Range} \times \frac{3}{4} \quad (\text{for full choke weapon})$$

6. PARADOX GUN  $\Rightarrow$  Smooth Bore weapon  $\cong$  rifling @ the end.

- $\hookrightarrow$  combination gun that can fire both pellets like a shotgun & paradox bullets like a rifle.





- ① Ear / Tympanic Membrane
- ② Lungs

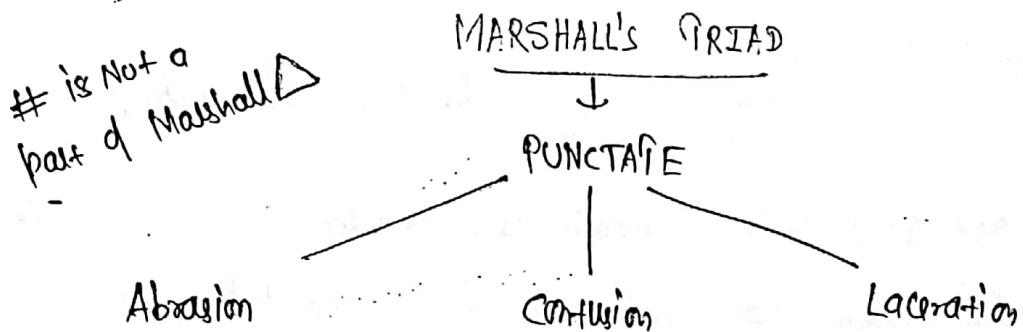
\* Homogeneous solid organs like Liver & Muscle are usually not affected

Mic in Underwater Blast

- ① GIT

\* Shock wave + Projectile → Return by Negative pressure suction.

Mic Head Immersed ⇒ Ear



MOLTOV'S COCKTAIL

- Home Made Bomb

- Incendiary Bomb

- Petrol Bomb we; Not Kerosene



Q. A tyre passes over the leg of a person resulting in Tyre Mark. What is the injury?

- a) Pressure abrasion
- b) Imprint abrasion
- c) Patterned abrasion
- d) Bruise

a) Pressure Abrasion

b) Imprint "

c) Patterned Bruise

d) Bruise

Q. Ladder tears are usually seen in → (a) Driver;

(b) Front Seat + Passenger;

(c) Pedestrian;

(d) Rear seat Passenger.

Q. Agonal Artifact → Perimortem Artifact.

Q. Which of the following is Not a Manifestation of shaken baby syndrome?

- a) Burns;
- b) Retinal hemorrhage;
- c) Rib #;
- d) SDH

Q. Not a feature of Post Mortem clot?

- a) Yellow chicken fat appearance;
- b) Adherence to wall;
- c) Red currant jelly appearance
- d) Friable

Q. Pragallot test is used to differentiate → Air embolism from putrefactive gas.

Q. Pink teeth in decomposed bodies is seen in death due to

- a) Asphyxia;
- b) CO Poisoning;
- c) CN Poisoning
- d) None of the above

Q. In water; Putrefactive changes are 1st seen in →

- a) Face;
- b) Chest;
- c) Upper Limbs;
- d) Abdomen

Q. After tooth injury; in how much time the socket is completely filled by organic clot? a) 1-2 days; b) 1wk; c) 2-3 mth; d) 6 mth

Q. Affiliation cases Refer to:

- a) Legitimation;
- b) Atavism;
- c) Supposition child;
- d) Status for Adoption

Q. In Advanced decomposition which one of the following can be detected?

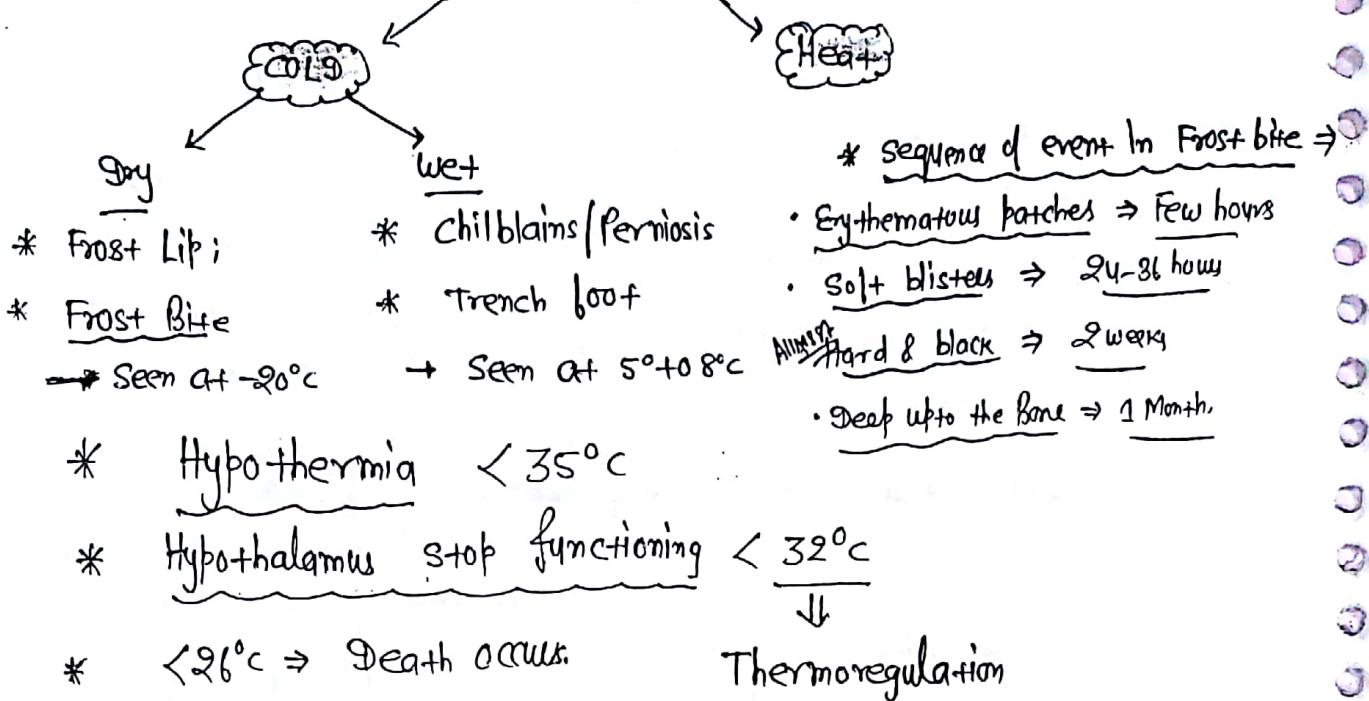
a) Valvular lesion of heart;

b) Thrombus in coronary vessels;

c) Ligature mark of hanging;

d) Loosening of brain





Thermoregulation  
Stops working

"Vasodilation Peripheral"

Person feels hot & Removes cloth; so;

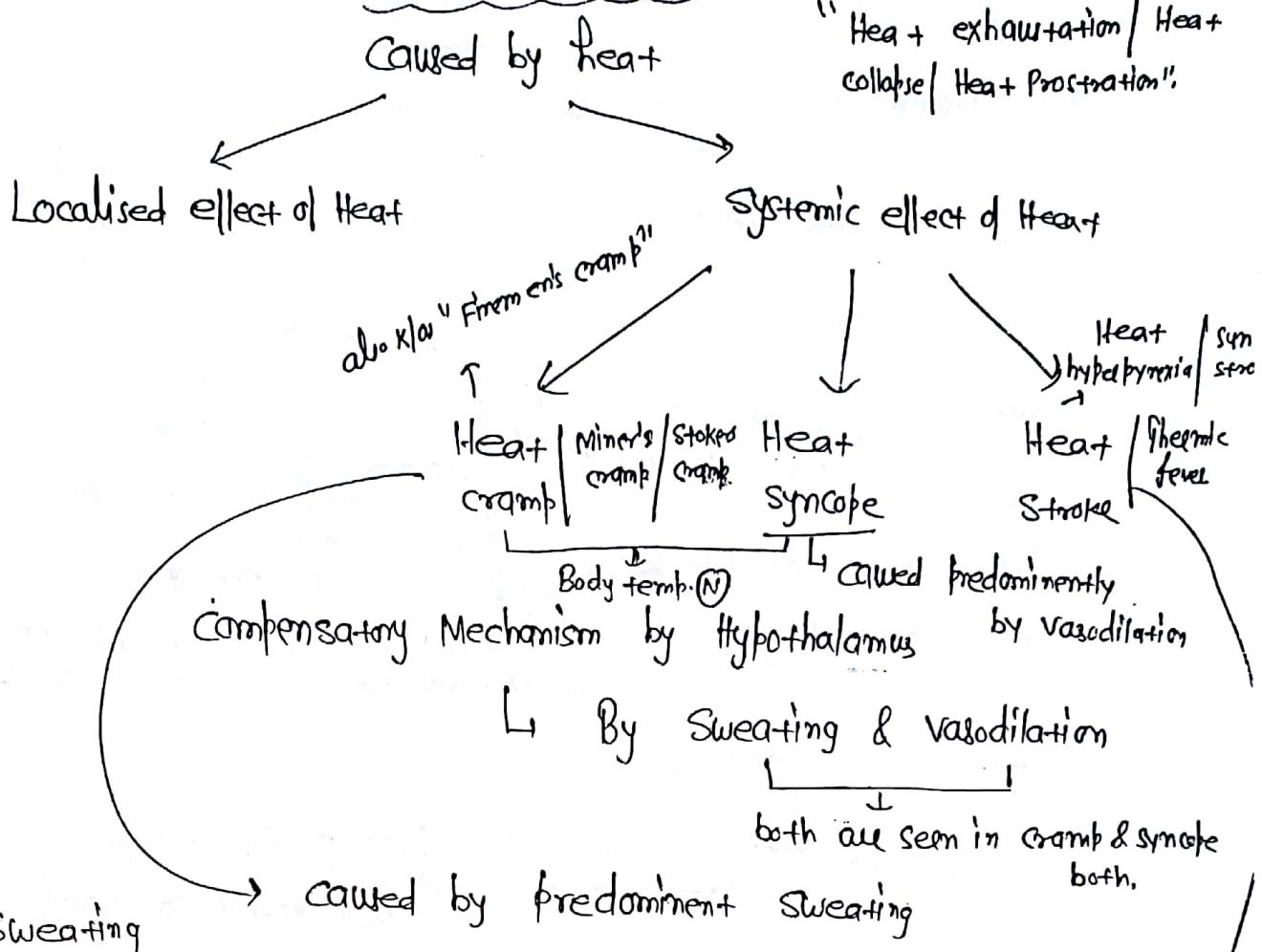
Subsequently Hide behind  
Chair, Sofa

Mental confusion

Found dead over there ⇒

Hide & die syndrome alw hypothermia





① Sweating

↓  
Loss of H<sub>2</sub>O, electrolyte

Temperature  $\Rightarrow$  Normal

↓  
Dehydration; hyponatremia

↓  
Heat cramps

Seen when body temp.  $> 41.5^{\circ}\text{C} / 106^{\circ}\text{F}$

② Vasodilatation

↓  
Predominant

↓  
Peripheral pulsing

↓  
Venuo Return

↓

cerebral hypoxia

↓

Syncope (Heat Syncope)

Hypothalamus stop functioning

Elevated  $\rightarrow$  Rise Temp.

No sweating

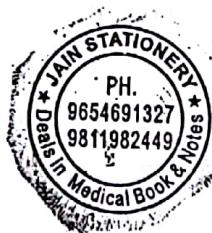
Pin-point pupil seen ( $< 1\text{ mm size}$ )

also seen in  $\Rightarrow$

Pontine Hemorrhage,

Morphine Poisoning

OP Poisoning



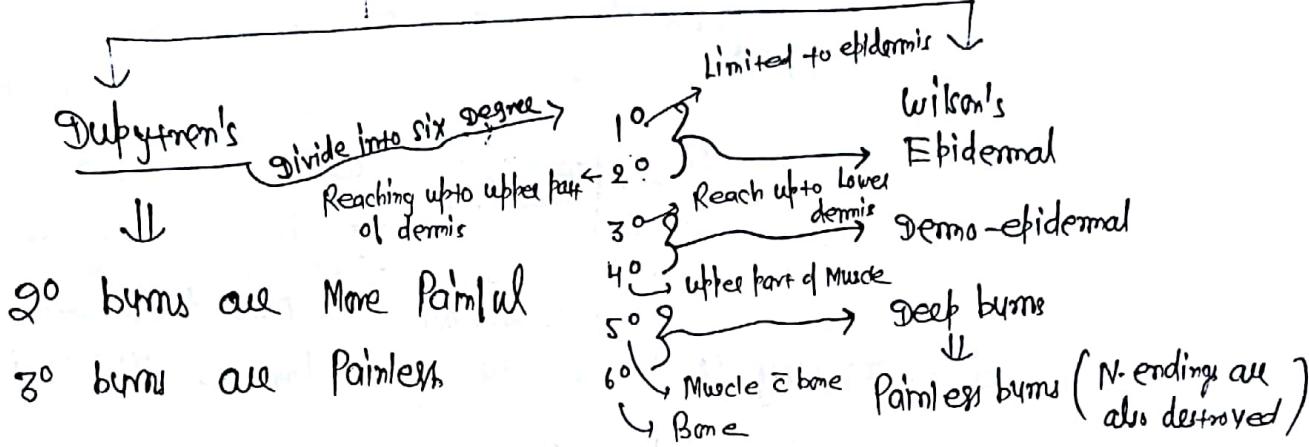
Causes of Burns

1. Burns - Minn temp.  $\Rightarrow 44^{\circ}\text{C}$  for  $\rightarrow 6\text{ hr.}$

$45-51^{\circ}\text{C} \rightarrow \text{time less by } \frac{1}{2} \text{ on } 1^{\circ}\text{C less}$

$65^{\circ}\text{C} \rightarrow 2\text{ sec.}$

Classification



### Calculation of Burnt area

(A) Lund & Browder chart  $\rightarrow$  Used in Age  $< 15\text{yr.}$

Best Method to calculating Burnt area

$$\text{Genitalia} = 1 + \text{Total body surface area}$$

Face  $\approx 7\%$

Neck  $\approx 2\%$

Head  $\approx 10\%$

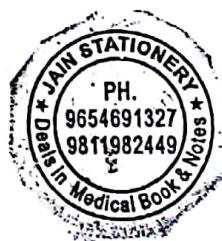
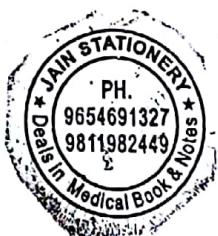
Front & Back of Trunk  $\approx 13\%$  Each

Each Upper Limb  $\approx 10\%$

Buttock  $\approx 2.5$  & each

Lower Limb  $\approx 24$  & each

Area of Body	In children (Lund & Browder chart)	In Adults (Wallace's formula)
Head & Neck	19	15
Trunk (Front)	16	16
Trunk (Back)	16	16
Upper Limbs	19	19
Lower Limbs	30	34
Genitalia	0	1



(b) Wallaces Rule of Nine → Used in age > 15 yr  
Genitalia = 1 + TBSA

③ Palmer's Rule  $\Rightarrow$  Patchy burns  
Palm = 1 + TBSA.

### ANTEMORTEM BURNS

- Presence of soot in trachea
- Measure Level of COHb  $> 5\%$  in Non-smokers  
 $> 10\%$  in smokers
- Test cyanide (Nylon burn  $\rightarrow$  cyanide)
- Cow feet appearance
- Signs of healing (Yellow coloured contusion)
- Vital Reaction  $\xrightarrow{\text{II}}$  sign of healing

### POST MORTEM BURNS

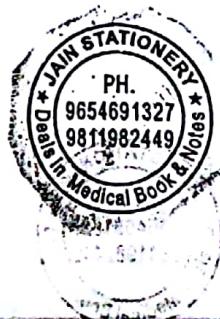
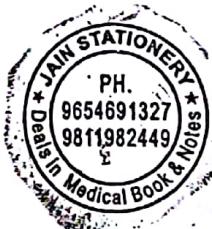
Heat  
Hematoma



Honey Comb appearance

Light Chocolate colour

Resembles ESDH



## Rupture



- Resembles Laceration  
(irregular Margin)
- No Bleeding seen
- Blood vessels intact

## Heat Fracture

Crosses over Suture line

### Cause of death ↳

M/c immediately CO ⇒ Neurogenic shock

CO poisoning

< 48 hr ⇒ Shock (Hypovolemic shock)

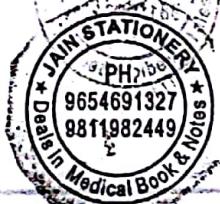
> 48 hr ⇒ septic (Septicemic shock)

Q. Minm v. of Cotto Reg. to give cherry Red colour  
→ 20%.

2. SCALDS ↳ Caused by moist heat  
temp.  $> 60^{\circ}\text{C}$

3. CHEMICAL BURNS ↳ Part in → Trickle  
Splashing

Never seen → Singeing of Hair  
Blisters



## 1. ELECTROCUSSION $\Rightarrow$ Joule burn seen

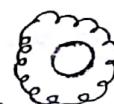
Endogenous burn

Normal burn is exogenous burn

Central depressed Area



Elevated peripheral Margin.



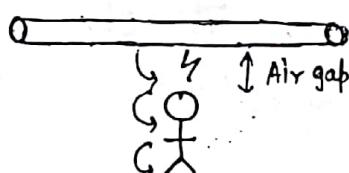
HPE  $\Rightarrow$  Streaming of Nuclei.

Most Resistant part to electric current  $\rightarrow$

Dry Skin  $>>$  Bone  $>>$  Moist skin

COD  $\Rightarrow$  Ventricular fibrillation (M/c)  $\Rightarrow$  if path is through heart  
follow Route of electric current. Medullary paralysis  $\Rightarrow$  if path is through Brain

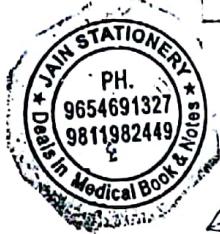
5. FLASH / SPARK BURN  $\Rightarrow$  Arching of current



Result in crocodile skin appearance

\* Most Dangerous path of electric current  $\Rightarrow$  From Left hand to Right foot.

\* Judicial electrocution carried out  $\Rightarrow$  In U.S. (United States)



M/c site  $\Rightarrow$  Shoulder / Flanks.

# Inverted fir tree appearance  
Mechanism of Injury

Direct strike

Indirect strike

Compressed Air pushed below the current

Expanded Air Repelled in front of the current

$\Rightarrow$  Lightning bolt can cause injury Resembles to Blunt trauma.

- Q. Which of the following is Not suggestive of Inhalational Burn injury?
- a) Yellow sputum;
  - b) Singeing of hair;
  - c) Facial Burns;
  - d) Hoarsened voice.

### STARVATION

• Feeling of intense hunger lasts for  $\Rightarrow 30-48\text{ hr}$

• Gall bladder distended, alt accumulation of bile from Lack of stimulation.

• Food & water stopped  $\rightarrow$  death - 10 days

• Food stopped - death - 60 days.

• Urinary Ketones - Time of Intervention

$\hookrightarrow$  to forcefully feed the person

\* Hunger Pangs  $\Rightarrow$  when hunger contractions start to occur in the stomach;

they are informally referred to as "hunger pangs".  
- they usually don't begin until 12 to 24 hours after last ingestion of food.

- ↳ i.e. Pulselessness  
SMOTHERING  $\Rightarrow$  Lips; Gums; Tongue; inner side of Nose May show bruising or Laceration  
GAGGING  $\Rightarrow$  External compression of Nose & Mouth  
CHOKING  $\Rightarrow$  Obstruction of oro-Nasopharynx by Any imprevious  
 object.  
 i.e. filling piece of cloth in mouth  
POSTURAL ASPHYXIA  $\Rightarrow$  Internal obstruction of the Upper Respiratory tract  
 ↳ wt. of self compresses the chest  
 seen in "JACK-KNIFE" Position

TRAUMATIC ASPHYXIA  $\Rightarrow$  Wt. of other compresses the chest  
 ↳ characteristic finding  $\Rightarrow$  Mosque ecchymosis (DNB + 15)

BURKING  $\Rightarrow$  Homicidal Smothering & Traumatic asphyxia

\* Smothering Resembles endotracheal intubation injury.  
 ↳ if Not in option; Throttling tick

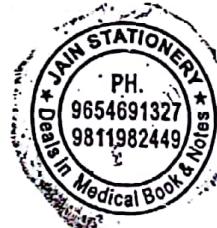
HANGING  $\Rightarrow$  Constricting Force  $\Rightarrow$  Wt. of body

Knot  $\rightarrow$  Typical occiput (@ Nape of Neck)  $\rightarrow$  Atypical  
 Knot  $\rightarrow$  Anywhere else

Judicial hanging  $\Rightarrow$  Left Angle of Mandible  
 (C<sub>2</sub>-G) #  
 ↳ Hangman's #

Tallentor's #  $\Rightarrow$  C<sub>1</sub> #

Undertaker's #  $\Rightarrow$  C<sub>6</sub>-C<sub>7</sub> #





complete

Incomplete / Partial  
Some parts of body touches the ground  
constricting force  $\Rightarrow$  weight of the head (5-6 kg).

Most characteristic sign of Hanging



Ligature Mark  $\Rightarrow$   $> 80\%$  above thyroid cartilage

Most characteristic sign of Ante-mortem Hanging



1. Gribbling of Saliva
2. La facies sympathetic



compression of cervical sympathetic chain

Some side

Eyelid open

Pupil dilates

Pressure of

2 kg  $\Rightarrow$

compresses

Fugital vein

COD

$\rightarrow$  M/c damage  $\rightarrow$  venous congestion

5 kg  $\Rightarrow$

carotid artery

$\rightarrow$  cerebral Anemia

Amussat's sign

15 kg  $\Rightarrow$

Trachea

$\rightarrow$  Asphyxia (M/c COD)

Tear in intima  
of carotid Artery

20 kg  $\Rightarrow$

vertebral artery



CONSTRICTING FORCE  $\Rightarrow$  Other than cut of Body.

Ligature  $\Rightarrow$  Ligature strangulation

Manually  $\Rightarrow$  Manual strangulation / Throbbing

Bamboo sticks  $\Rightarrow$  Bandola

Elbow  $\Rightarrow$  Mugging

Judicial strangulation  $\Rightarrow$  Garrotting

"Spanish windlass technique"

↳ Practice in Spain.



# Hyoid                  # Thyroid                  # Cricoid

Hanging  $\rightarrow$  15-20%

--

--

Strangulation  $\rightarrow$  30-40%

+

Rare

Throbbing  $\rightarrow$  40-50%

+

+

① Adduction / inward compression # of Hyoid

Junction of inner 2/3rd & outer 1/3rd of greater cornu

Highly suggestive  
of Throbbing

② # cricoid cartilage



Homicidal Hanging by MoB.



& following large dose of

tranquillizers.

1

Graig Reddick suffered

## Cardiac Arrest

V

Asphyxia →

Choking

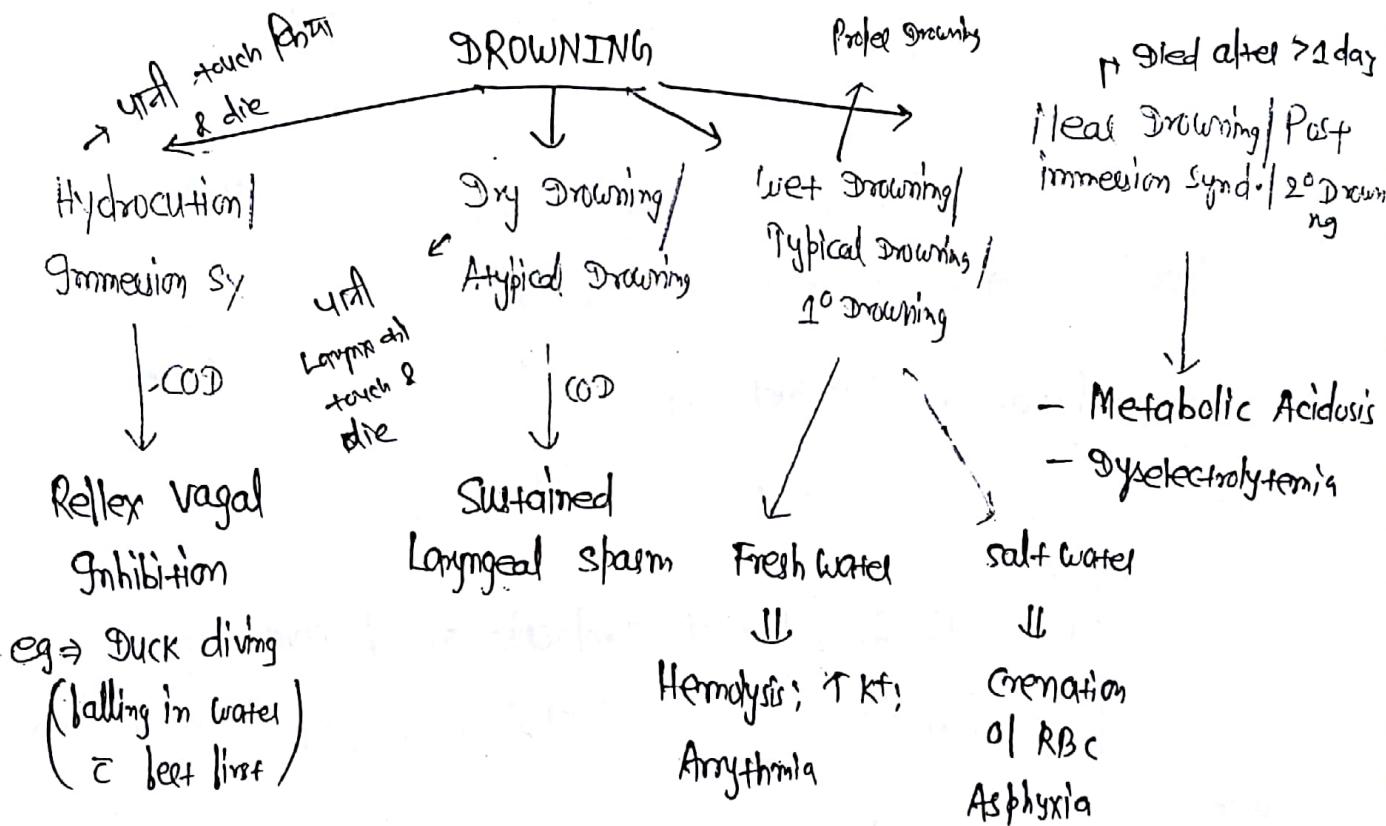
Rx  $\Rightarrow$  Heimlich Manoeuvre

M/c by "chicken food"

## Modified Heimlich Manoeuvre for Infants

↳ Klaus "Choking Rescue Procedure"

It is external choking by bolus of Food obstructing Larynx.



⇒ Footh ⇒ ⊖

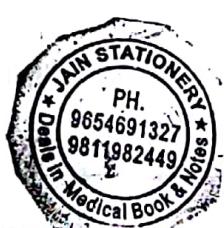
一

十

1

b/c Pele  
e

4 Person die before water enters lung



passage

(Mucus + Air + Sputum)

Pathology of Drowning  $\Rightarrow$

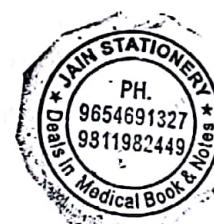
Fresh water drowning  $\Rightarrow$  Hypotonic  $\rightarrow$  Cells loose H<sub>2</sub>O  $\rightarrow$  Hemolysis & +  
Swelling & Bursting

Salt water drowning  $\Rightarrow$  Hypertonic  $\rightarrow$  Plasma conc'↑  $\rightarrow$  R.B.C. Loses Water  
 $\downarrow$   
Crenation of R.B.C.  
 $\downarrow$   
Asphyxia  $\leftarrow$  Can't take O<sub>2</sub>

Dangerous?

Fresh water: Dies in 3-4 min

Salt water: Dies in 8-12 min.



PM appearance of Drowning  $\Rightarrow$

Grass & Weeds  
in hands



Cadaveric  
spasm



Seen in AM

Washwoman's  
hands & feet



> 24 hr (Body in water)



Seen in both

AM/PM

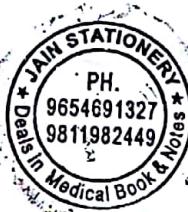
Cut's Anselma/  
Goose flesh



AM/PM

$\frac{1}{2}$  d/f Rigor Mortis

PM appearance of lung  $\Rightarrow$  Alive & conscious (in AM Drowning)



Found only in wet drowning

Not in dry drowning

Emphysema acuminatum (water logged; heavy voluminous lungs)

Lungs become bulky

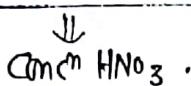
Palpable hemorrhage — Subpleural hemorrhage  
Emphysema

↳ Shell Made of Silica  $\Rightarrow$  Frustule

- Diatoms of <60 microm enter Pulmonary circulation
- $\oplus$  of diatoms in systemic circulation  $\Rightarrow$  Confirms AM drowning
- Max<sup>m</sup> diatoms are seen in  $\Rightarrow$  BM of Femur  
but for preservation used "Sternum"

Best organ to detect Diatom  $\Rightarrow$  Kidney

Test  $\Rightarrow$  Acid Digestion test



- Most characteristic signs of AM Drowning  $\Rightarrow$

Graiss & Weidu  
in Hand  $\rightarrow$  Emphysema  
acquosum  $\rightarrow$  Palatoul's Hemorrhage  $\rightarrow$  Diatoms  
in systemic  
circulation  $\rightarrow$  Frustule

\* Strontium Rise  $\Rightarrow$  suggestive of AM drowning

\* Intimal damage to Carotid Artery  $\Rightarrow$  Hanging  $\in$  a Corp.

GETTLER'S TEST : Used to determine Salt/ Fresh water death.

If the difference  $\oplus$  of Cl<sup>-</sup> b/w two Atria  $\geq 25\%$   $\Rightarrow$   $\oplus$

e.g.  $\Rightarrow$

1 Unit	$\leftarrow$	RA	LA	10 min

\* Normally the chloride content  
is equal in the R+ & L+ chambers  
of heart (60 mg/100 ml).

\* If Cl<sup>-</sup> ↑ in LA  $\Rightarrow$  Salt water drowning;

\* If Cl<sup>-</sup> ↓ in LA compared to RA  $\Rightarrow$  Freshwater drowning;

Exception  $\Rightarrow$  a) In ASO

b) Decomposed body

c) Brackish water (Gastric H<sub>2</sub>O)

} Gettler's test is Not useful

Ability to perform

Intel course



↳ ground for divorce

Ability to beget  
children



No ground for divorce

Frigidity ⇒ Female impotence



Vaginismus

vagina is abt.

AntiRape Muscle ⇒ Gracilis (Adductor of thigh).

spasm of Adductor of thigh.

\* M/c cause of

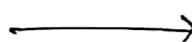
Impotence ⇒ Vasculogenic

Temporary impotence ⇒ Psychogenic

\* EXCUD HANC - Selective impotence

### CONSENT OF SPOUSE

MTP



X

sterilization

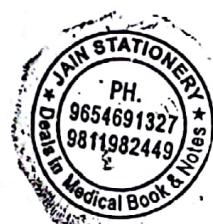


X

Artificial Insemination



✓

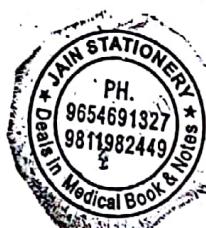


### SURROGACY REGULATION BILL, 2016

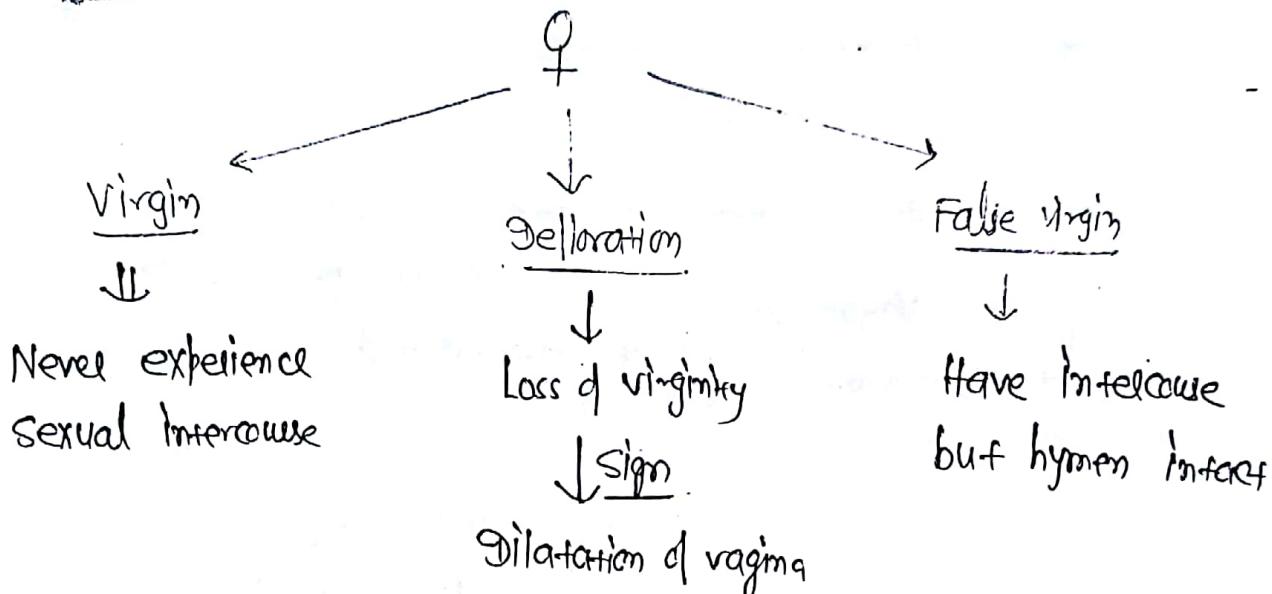
No Law Regulating Surrogacy in India

Commercial surrogacy - Not allowed

- only the patients who are infertile (after 5 yr of unprotected intercourse)



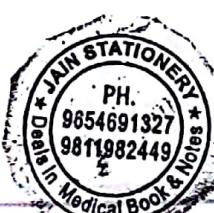
- should have one child of his own
  - only once (excluding failed attempts)



In children - deep seated; sc;  
Not ruptured.

- is Ruptured in Sexual Intercourse
- Masturbation
- Sanitary tampons
- Praying
- Sola bith

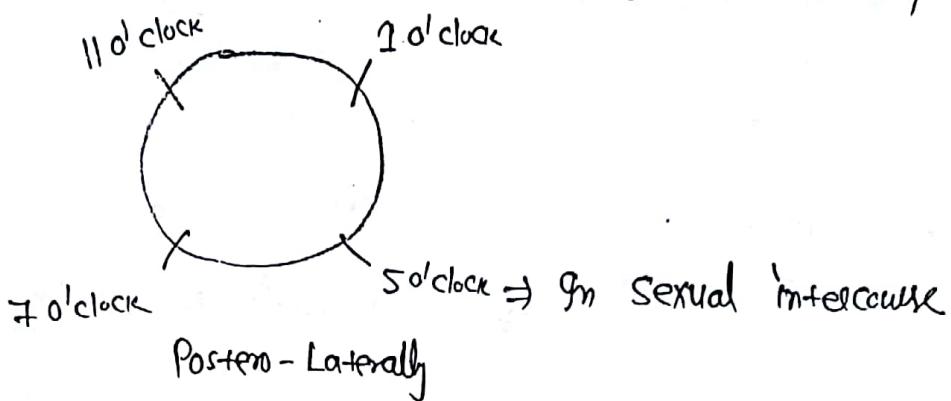
for sexual intercourse



Site of rupture

Anterolaterally

→ In Masturbation/Fingering



Glaistel Keene Rod →



↳ Instrument used to inspect hymen.

Type of hymen → crescentic hymen (Mc).

↳ "Kla" semilunar hymen

↳ Fimbriated hymen Resembles torn hymens.



cornuciae Myrtiformes → Remnants of hymen seen after child birth.

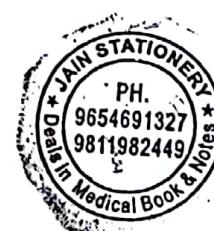
Nulliparous uterus

Cavity → Wall convex from inside



Concave

External os → Circular



Slit like

True Virgin

Intactness → Hymen intact & inelastic

False Virgin

Hymen intact but elastic

Hymen opening → Barely admit tip of little finger

Admits two fingers easily

Edges → Distinct

Undulated.

A.I. HUSBAND (A.I.H)  
↓  
1st Best

A.I. HUSBAND DONAR  
(A.I.H.D)  
↓  
2nd Best

A.I. DONAR  
(A.I.D)  
↓  
3rd Best.

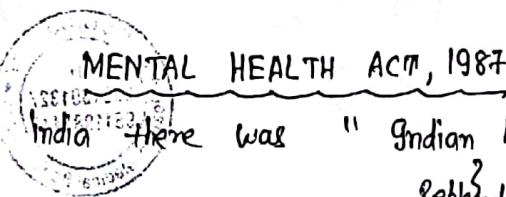
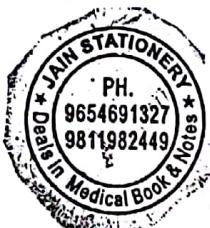
- \* APTAE VIRIS ⇒ Making a female fit for sexual act/intercourse
- \* NON APTAE VIRIS ⇒ A female Not fit for sexual intercourse

### BATTERED BABY SYNDROME

→ Klaus " Caffey's syndrome"  
— Non-accidental injury of childhood

- Features —
- a) Repeatedly come for Rx ;  
↳ But come late
  - b) Inconsistent history & examination;
  - c) Different aged injury are found.

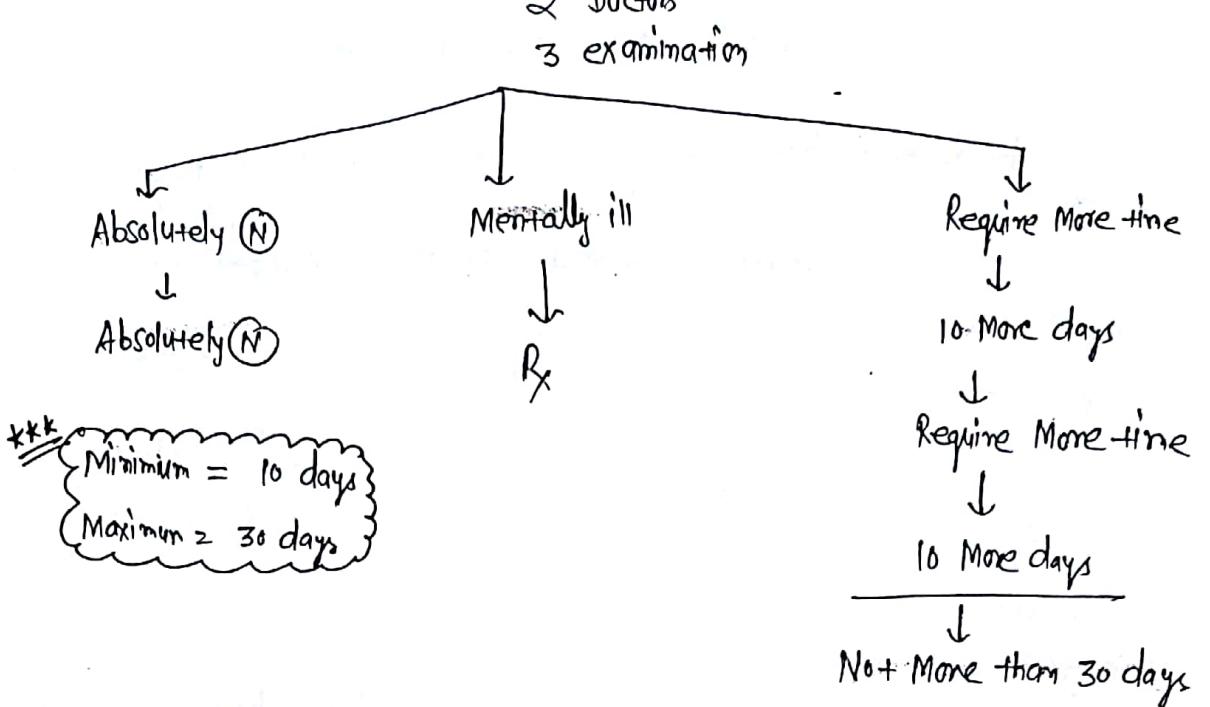
- Most imp. clinical features —
- a) Oblique # | spiral # ↳ Shaken Baby syndrome
  - b) SDH can be seen ↳ Infantile whiplash Sx
  - c) String of pearls appearance : seen on chest
  - d) Six perry bruises



- Before this: In India there was " Indian Lunacy Act 1912"  
↳ Replaced by

Mental Health Care Act, 2017 ↳ Replaced by Mental health act, 1987

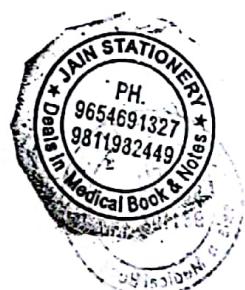
- \* "Mentally ill Person" is to be addressed (Pt.) ↳ Should produce → Magistrate passes → Reception  
↳ Admitted to Mental Hospital ↳ In front of



\* MTP Act, 1971  
Last Amended  $\Rightarrow$  2003

Based on Declaration of OSLO: (Therapeutic Abortion)

- Humanitarian - Rape
- Eugenic ground - Chromosomal Anomalies
- Social ground - Failure of contraception  
Poor socio-economic cond<sup>n</sup> of Patients
- Therapeutic ground - { Mother's Life is Endangered
- \* <12 wks : 1 Doctor
- 12-20 wks : 2 Doctors
- >20 wks : Under therapeutic grounds only { irrespective No. of doctors ; irrespective of experience ; irrespective of knowledge
- \* Consent of Husband is Not Required;
- \* Consent of only women is Required (if she is over 18 yrs & sane) & Consent of Parents / guardian is Required if she is below 18 yrs or above 18 yrs but insane



MTP (Amendment) Bill, 2014 (Not Act)

- \* Should be increased till  $\leq 24$  wks
- \* Not only Allopathic; but also Elite doctors should be allowed (RHM / Ayurvedic / Unani)

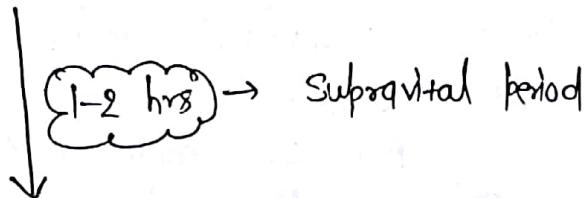
— Study of death in all aspects

- Bichat | Bishop ⇒ Tribod of Life Modes of death / Atria Mortis
- Brain Stop functioning → Coma
  - Heart → Syncope
  - Lung → Asphyxia



Not Mention in Death certificate

Somatic | clinical death ⇒ Some cells are died; Some are alive



cellular | molecular death

After death (0.5-1 hr) → Topically instill 1% Atropine in eye



?? Pupil

↳ Irregular dilation of Pupil

b/c only live cells are

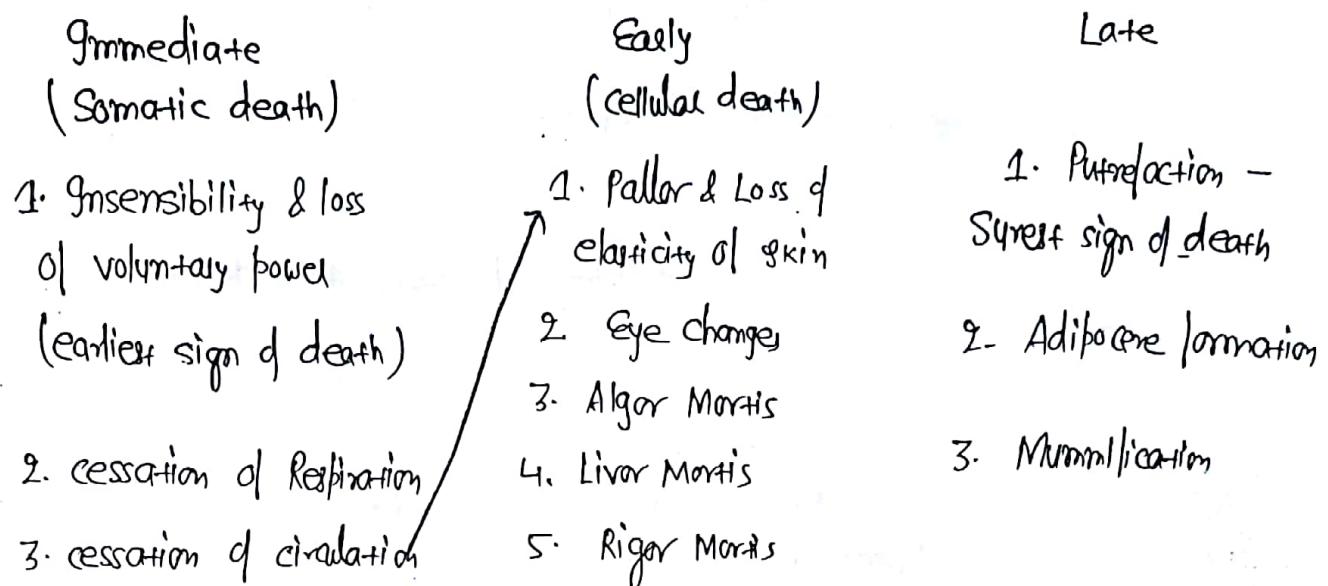
Responding; dead cells are also ↗

Tsako's Phenomenon

→ About 1 hr of death

— Kneel jerk (elicit)

↓  
contraction of quadriceps.



### Eye changes

- ↓ in IOT  $\Rightarrow$  Earliest 1/2 @ death  
Zero in 2 hrs.
- Rise of Potassium in vitreous humor (MIDEA's FORMULA  
STURNER's Equation)
- Cornea  $\Rightarrow$  Hazy in 2 hrs.
- Kevorkian sign / cattle trucking  $\Rightarrow$  Trucking of blood in blood vessels
  - ↳ Seen in Minutes ; by ophthalmoscope



Trucking of blood due to cessation of circulation

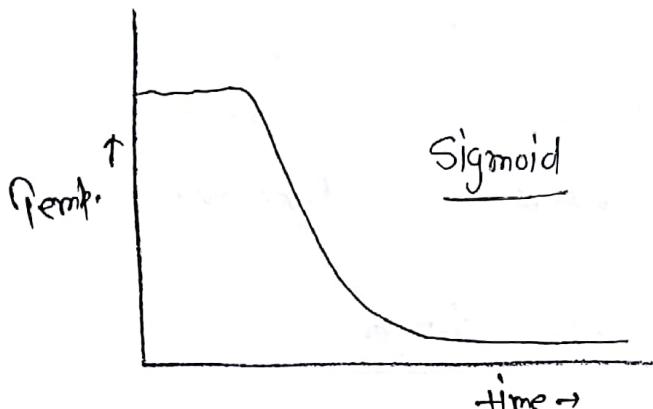


Sign seen max upto 2 hrs. (till cornea become hazy).



Tache Norm  $\Rightarrow$  Accumulation of toxins in body  
 $\Rightarrow$  eyelids - open after death  
 $\Rightarrow$  About 3 hrs.  
 Resembles to Pterygium.

ALGOR MORTIS  $\rightarrow$  Cooling of body After death



- temp. doesn't fall till 30-60 min. after death.
- Recording body temp.  $\Rightarrow$  ① Rectum  
 $\Downarrow$  but in sodomy  
 $\Downarrow$  inferior surface of Liver
- by "Thermometer"  
 $\Downarrow$
- Length  $\Rightarrow$  25 cm
- ② Synthetic Membrane
- ③ Intranasal = cribriform plate

- Rate of cooling  $\Rightarrow$   $0.5 - 1.5^{\circ}\text{C}/\text{hr}$ . OR  $1.5^{\circ}/\text{hr}$   
 $\downarrow$  Summer       $\downarrow$  Winter

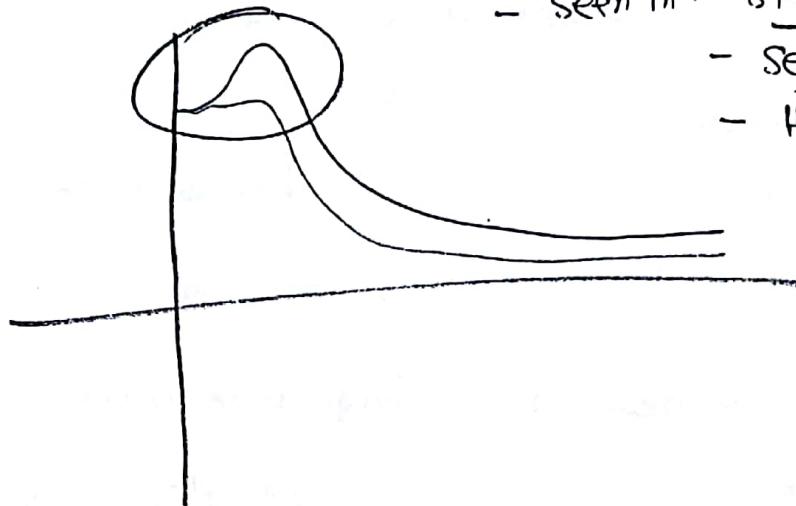
Q.\* On 25<sup>th</sup> June 7 am;  $R/T = 31^{\circ}\text{C}$ . Time since death?

1. 23/6, 7 PM
2. 24/6, 7 AM
3. 24/6, 7 PM
4. 25/6, 7 PM



Rise of Body temp. 1-2 hr of death.

- Seen in - Strychnine Poisoning
- Septicemia
- Heat stroke

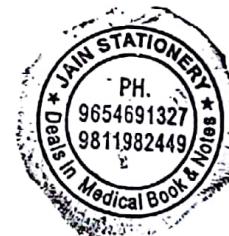


Hypostasis | Liver Mortis | PM staining | Cadaveric Lividity | Suggillation |  
ribicus | Darkening of death.

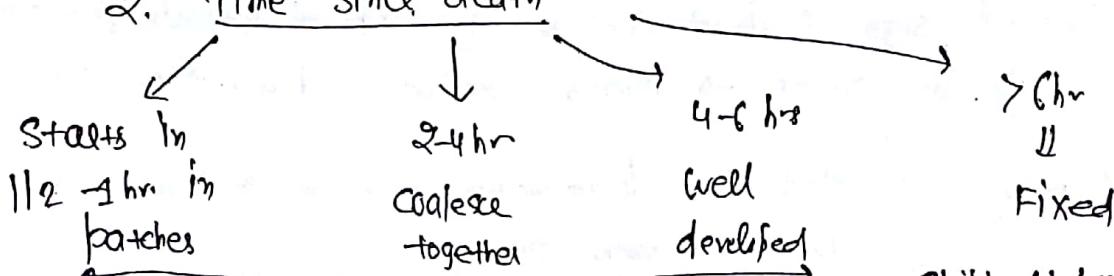
- Gravitation of blood in dependent parts
- Area of Surface flattening | contact flattening
- Uses - 1. Posture of body

1st Seen over Neck - supine position

Glove & stocking position of hypostasis  $\Rightarrow$  Hanging  
if body is continuously floating in water  $\Rightarrow$  No Hypostasis



## 2. Time since death



See in forensic Medicine  
Simplified  
on 16 page

- b) Indices for determining gender;
- c) different declarations;
- d) Posture;
- e) smell in different poisoning



(N) colour after death  $\Rightarrow$  Bluish-purple colour.

### Poisoning

		<u>colour</u>
i>	CO	Cherry Red
ii>	CN	Bright/ Brick Red
iii>	Nitrate/ K <sub>3</sub> chlorate	Reddish Brown
iv>	Aniline	Reddish Brown > Blue
v>	Phosphorus	Dark Brown
vi>	Hydrogen Sulphide (H <sub>2</sub> S)	Bluish green
vii>	KCN	Deep blue
viii>	Opium	Black
ix>	Hypothermia	Pink

### DIFFERENT DECLARATIONS

ATMs OS, 17  
 ① Declaration of Tokyo  $\Rightarrow$  Says about "Torture & Medicine"  
 (1975) says A doctor can't use his Medical knowledge for torture.  
 It pertains to offences committed to board Aircraft (GNBIS)

② Istanbul Protocol  $\Rightarrow$  deals w/ documentation of torture in torture victim.  
 How to document TORTURE.

- ④ Declaration of Oslo  $\Rightarrow$  Deals w/ Therapeutic Abortion;
- ⑤ Declaration of Geneva  $\Rightarrow$  Modernization of Hippocratic Oath;
- ⑥ Declaration of Helsinki  $\Rightarrow$  Deals w/ Human experimentation & clinical trials;
- ⑦ Declaration of Lisbon  $\Rightarrow$  Deals w/ Patient Rights;
- ⑧ Declaration of Sydney  $\Rightarrow$  Deals w/ Brain death,
- ⑨ Declaration of Malta  $\Rightarrow$  Deals w/ Role of doctor in Hunger strike

- Can't interfere to one's hunger strike
- Forceful feeding is Not allowed,

$\Downarrow$   
but if any govt. officer (e.g. Narendra Modi) told to break the strike

$\hookrightarrow$  then by Article 21 we can force people on hunger strike to eat,

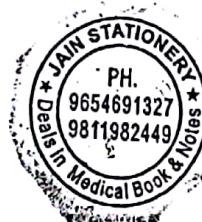
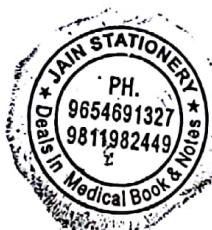
⑩ Declaration of Hamburg  $\Rightarrow$  Support for doctors refusing to participate in or other form of cruel; inhuman or degrading treatment

⑪ Declaration of Munich  $\Rightarrow$  Racial; Political discrimination in Medicine.

⑫ Declaration of Venice  $\Rightarrow$  Terminal illness

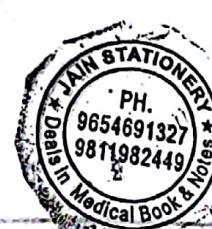
⑬ Declaration of Seoul  $\Rightarrow$  Deals w/ Professional Autonomy & clinical independence

⑭ Declaration of Madrid  $\Rightarrow$  Deals w/ Professional Autonomy & self Regulation.



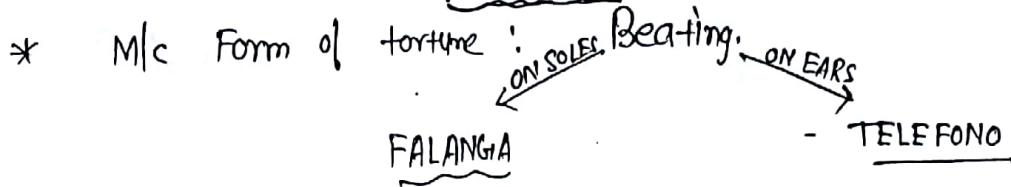
Gnades

1. Ischiopubic Index (Washburn's Index)	$\frac{\text{Pubic Length}}{\text{Schiad Length}} \times 100$	♀	91 to 115	σ 73-94
2. Pubic Ramus Ratio		♂:1 or greater		1:1
3. Sternal Index	$\frac{\text{Length of Manubrium}}{\text{Length of Body}} \times 100$		54.3	46.2
4. Corpo-basal Index	$\frac{\text{Breadth of 1st + sacral vertebra}}{\text{Breadth of base of Sacrum}} \times 100$		40.5	45
5. Sciatic-Notch Index	$\frac{\text{Width of Sciatic Notch}}{\text{Depth of Sciatic Notch}} \times 100$	⇒	5 to 6	4 to 5
6. Sacral Index	$\frac{\text{Transverse Diameter or Breadth of base of Sacrum}}{\text{Length of Sacrum}} \times 100$	⇒	116	112
7. Crural Index	$\frac{\text{Length of Tibia}}{\text{Length of Femur}} \times 100$	⇒	83.3	86.2
8. Brachial Index	$\frac{\text{Length of Radius}}{\text{Length of Humerus}} \times 100$	⇒	74.5	78.5

Gnades to determine RaceEuropeansNegroes

$$\left( \frac{\text{Length of Humerus} + \text{Radius}}{\text{Length of Femur} + \text{Tibia}} \times 100 \right)$$

## TORTURE



\* Dry Submarine  $\Rightarrow$  Tying a plastic bag over the head Until Suffocation.

↳ Can we tell A.M. or P.M. death ? Yes

\* Wet Submarine (Latina)  $\Rightarrow$  Forced immersion of head in water contaminated  $\approx$  Urine or feces.

\* Picana  $\Rightarrow$  Electric torture.

\* LA PARILLA  $\Rightarrow$  Tie a person to electrometallic grill.

\* PLANTON  $\Rightarrow$  Torture by prolong Standing;

\* STRAPPEDO  $\Rightarrow$  Tie hand behind person & Suspend ~~at~~  $\approx$  La Bandera

\* PARROT's PEARCH :

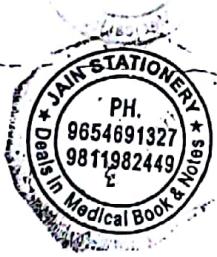
\* CATTLE PROD : Electric shock over genitals,

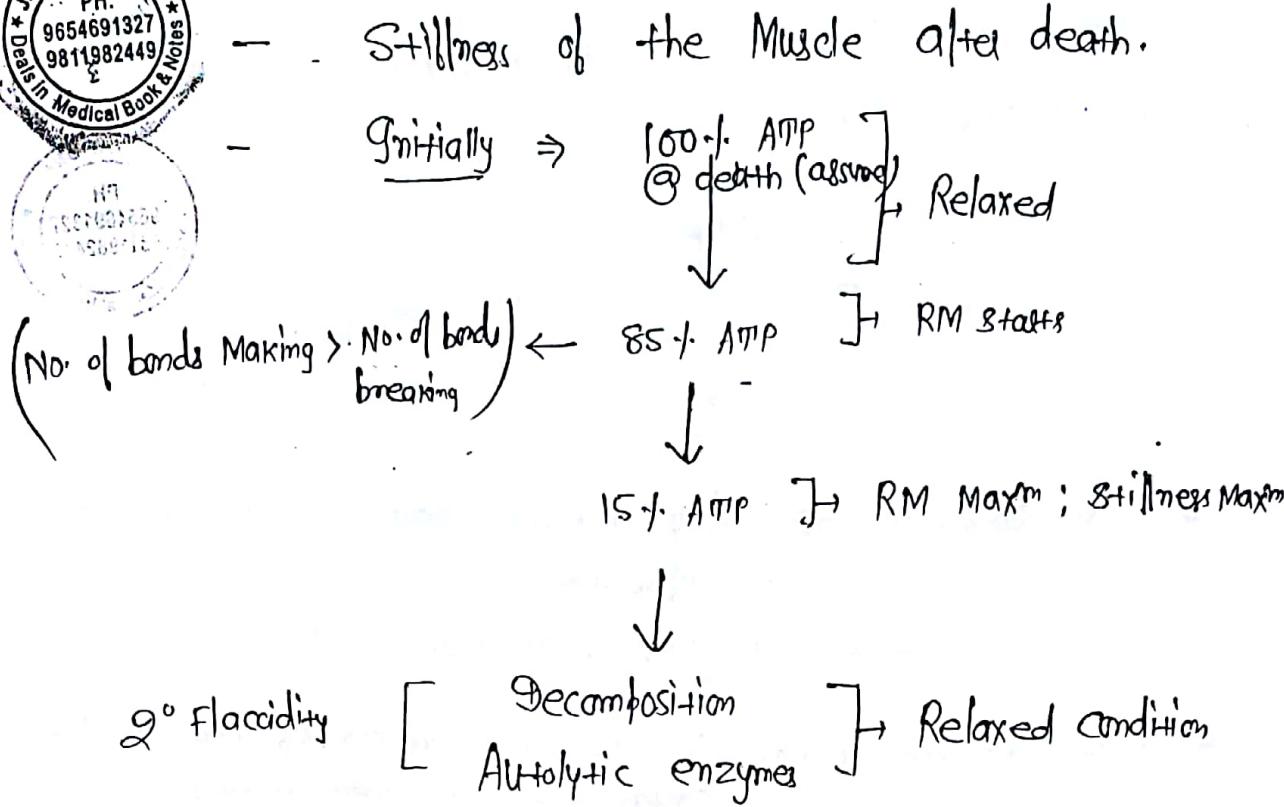
\* CHAPUWA :

\* GHOTNA :

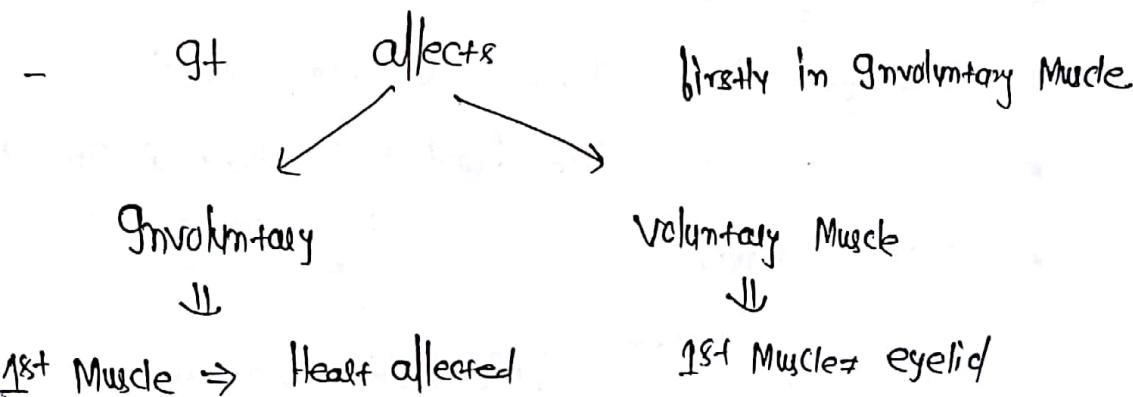
\* DUNKING : Victim immersed into water, taken out after some time and given chance to confess.

\* SHAM EXECUTION : आंख बंद करके शीद पर गाड़ी के सम्में ढीड़ देना।



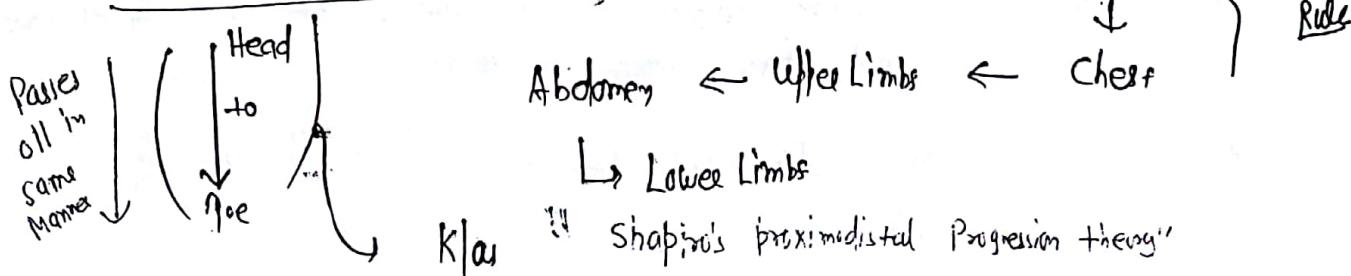


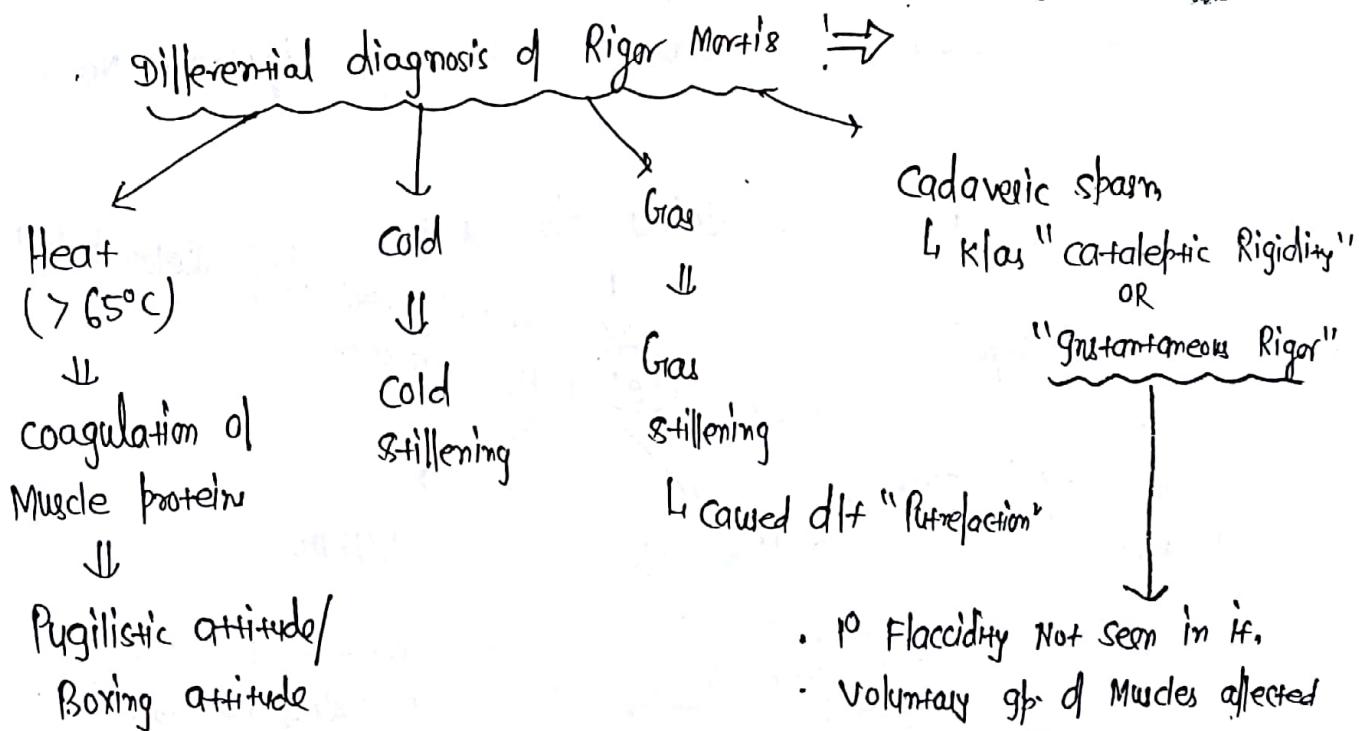
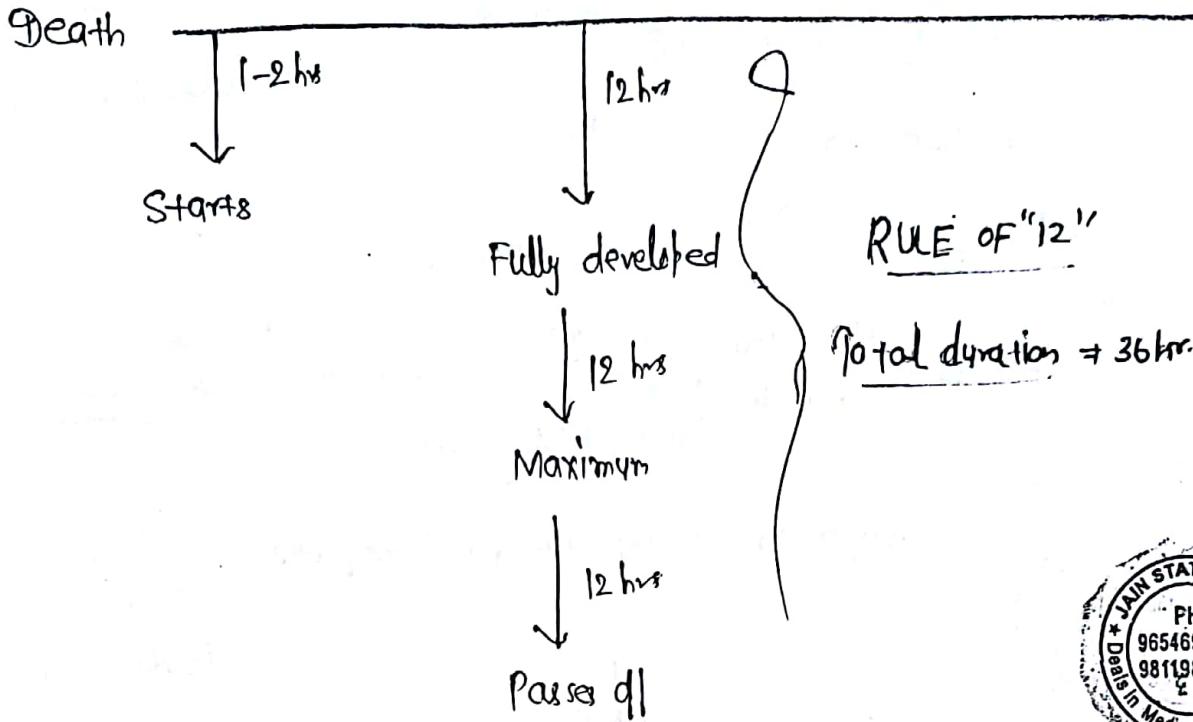
- Relaxation immediately after death  $\Rightarrow$  1° Flaccidity.



RM not seen in  $\Rightarrow$  fetus of less than 7 months

PM changes in RM  $\Rightarrow$  Heart  $\rightarrow$  Eyelid  $\rightarrow$  Face  $\rightarrow$  Neck  $\rightarrow$  Lower Jaw  $\downarrow$  Nysten's Rule





(N) Death  $\rightarrow 1^{\circ}\text{F}$  ————— R.M. —————  $2^{\circ}\text{F}$

Cadaveric spasm  $\rightarrow 1^{\circ}\text{F}$  ————— R.M. —————  $2^{\circ}\text{F}$   
↳  $1^{\circ}\text{F}$  abt. in cadaveric spasm



## Cadaveric Spasm

Cellular death  $\Rightarrow \otimes$

In subnecrotic period

Electrical stimulus  $\Rightarrow$

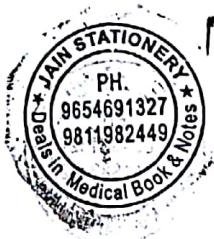


Medico legal importance

Indicates circumstances & Mode of death.

## PUTREFACTION

\*



M/c organism Responsible for Putrefaction  $\Rightarrow$  *cl. welchii*



produce "Leathimase"

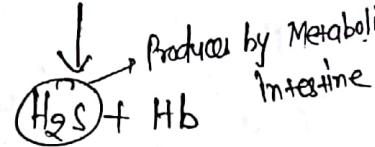
Colour changes

Graves

Liquifactive Nemosis

## Colour changes

1<sup>st</sup> internal sign



Produced by Metabolism of substance produced in intestine

Reddish discolouration  
of Aortic Intima

Sulph Meth Hb

Sulph Hb

2<sup>nd</sup> internal sign  
Greenish discolouration  
on inferior sur. of Liver

1<sup>st</sup> external sign

Greenish discolouration  
of walls of Blood vessels  $\Rightarrow$  KION MARBLING

seen in  
36-48 hr after death

Greenish discolouration  
of R + iliac fossa

• Caecum  $\approx$  12-15 hr

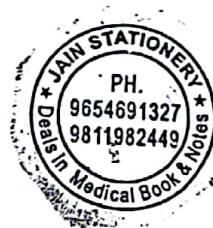
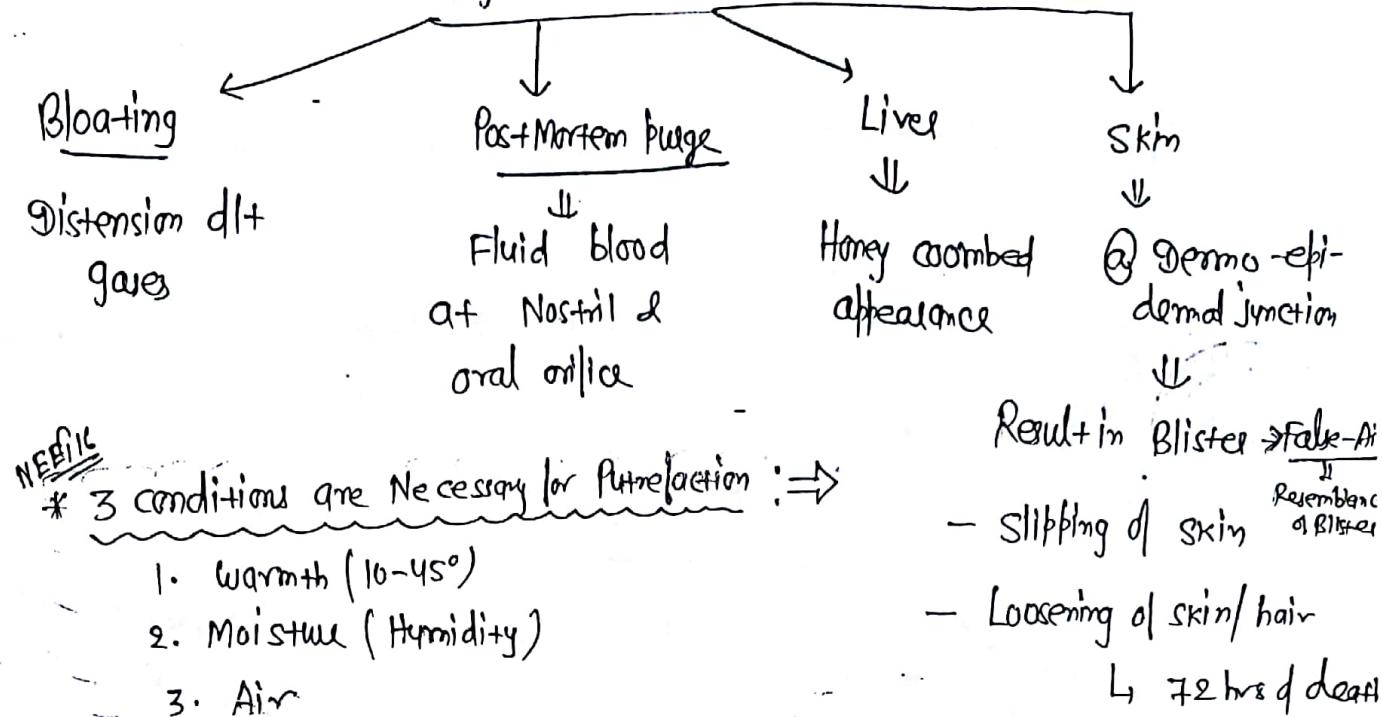


## Rigor Mortis

cellular death  $\Rightarrow \checkmark$

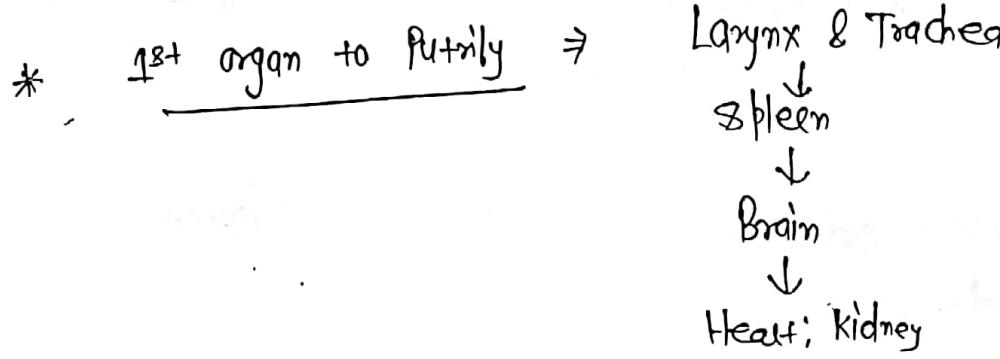


Indicates time since death



### Liquefactive Necrosis

Seen in 5 to 10 days



Temp. optimal for Putrefaction -

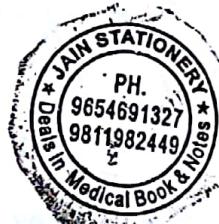
$21^\circ\text{C} - 38^\circ\text{C}$

Last organ to Putrefy ⇒

Bone  
Tendon  
Skin

Prostate

Non-gravid uterus



death).

d1+ Photobacterium

d1+ Armillaria

Casper dictum  $\rightarrow$  Fast in Air; then water & then after soil.

- Rate of decomposition

↓

Air : Water : Earth  
1 : 2 : 8

On Absence of Air  
Colour = Greyish white  
OR  
Rotten (NEEMIC)

ADIPOCERE

On Absence of Moisture  
Colour = Rusty Brown to Black

MUMMIFICATION

- Saponification of Fats

- Desiccation / Drying of tissues

- M/c  $\Rightarrow$  Palmitic acid

↳ Produce Glycerine; who  
Creates Calonilicaria:  
Sweat mix  
Atm. Remove  
Glycerine

- Dry & hot atmosphere

- Ammoniacal odour

- Odourless

- Cheesy

- Sweet

- takes about 3 months - 6 months

- takes about 1 yr. to develop

- On India  $\rightarrow$  3 days

- Chronic As & Antimony Poisoning

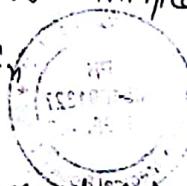
↳  
Favours Mummification

- Useful in

COD

Time since death

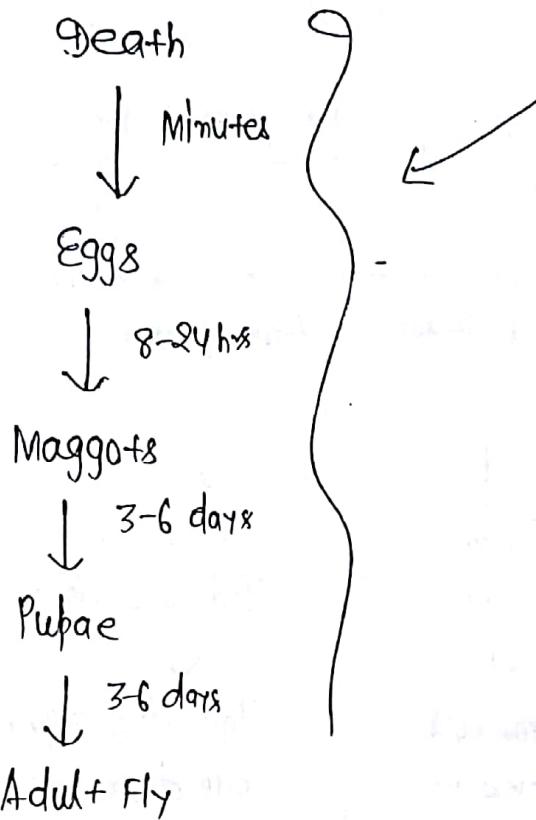
Useful in



Identification (Facial features are preserved only in early stages)



## Study of Insects



\* Pink teeth in decomposed bodies is seen in death due to leakage of Hb in dental tubules.

~~NEFIC~~ 1st organ to be involved in Mummification  $\Rightarrow$  Skin of exposed body parts like Lips; Nose tips; Hands (Fingers) & Feet (toes)

Q. Which of the following is Not suggestive of Inhalational burn injury?  
② Yellow sputum; ⑥ Singeing of hair; ③ Facial burns; ④ Hoarseness of voice

Q The causative electrode of electric injury can be identified by :-

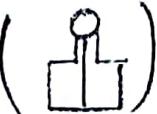
- (A) Acid Rxn;
- (B) Current Pearl;
- (C) Bone Pearl;
- (D) wax dripping



## Incision !

"I" SHAPED

⇒ (M/C) Start from chin goes in Midline upto Pubic symphysis



"Y" SHAPED

⇒ Start from Mastoid; goes to Midsternal Notch → Pubic symphysis



"MODIFIED Y" SHAPED

⇒ Start from Substernal Notch.



\* In case of Suspected torture the skin incision used ⇒ "X" SHAPED.  
From Tip of shoulder → Angle of Lewis → Pubic symphysis

Techniques to examine Internal organ

Rokitansky

In Situ



Organs cut &

Lift Inside  
body

Gibon

En Bloc



organs are  
removed in  
Blocks

Virchow

Individual organ



Individual organ  
are dissected

Letuelle's

En Masse



All or everything  
at once from  
tongue till Rectum

Cavity opened first

Head



Head injury

Poisoning → Head (Smell of Poison)

Abdomen



Inhalicide

Thorax



Air Embolism

Asthenia  
No COD Mentioned

Lastly opened

Neck

Viscera preserved in Routine Autopsy

1. Stomach :  $\frac{1}{2}$  all contents;

2. Intestine : 30 cm of proximal intestine;

3. Blood : 30 ml of blood (taken from Femoral vein;  $\frac{1}{2}$  Min 10 ml should be preserved)

4. Liver : 1/2 kg of Liver ; should be preserved;

5. Kidney : 1/2 of each kidney should be preserved;

+ Spleen ! Full spleen should be preserved

- Gmflow outflow technique
- $(RA \rightarrow RV \rightarrow LA \rightarrow LV)$   $\Rightarrow$  sequence of chamber opened

### Spinal cord

Posterior

Bشت

Anterior

M/c



### Poisoning

During Post mortem we preserve viscera ; blc of some poison have specific character

Digoxin  $\Rightarrow$  Heart is preserved

strychnine  $\Rightarrow$  Brain | spinal cord

Alcohol  $\Rightarrow$  CSF | vitreous | blood | urine | stomach | Liver

Anesthetic volatile agent poisoning  $\Rightarrow$  a) Lungs in Nylon bag

b) Mesenteric fat  $\hookrightarrow$  Non-absorbable

$\hookrightarrow$  also in OPC poisoning

I.m. injection  $\Rightarrow$  Site of injection preserved

Bile | gall bladder  $\Rightarrow$  Morphine | Barbiturates

Cocaine poisoning  $\Rightarrow$  Nasal swab

Best Preservative  $\Rightarrow$

Rectified spirit (90% alcohol)

Not used  
Rectified spirit;  
use NaCl

Phosphorus  
Alcohol  
Phenol  
Paraldehyde  
Acetone

Best preservative  $\Rightarrow$

NaP  
100mg / 10ml Enzyme  
also in M.R.N. corona thrombin

Inhibiting glyc

Hyp  
enolate

Enzyme

100mg / 10ml

Enzyme

Enzyme

Enzyme



↓  
Not used in

- Corrosive
- Acmite
- Corrosive sublimate

\* Urine = Toluene > Thymol

\* Bitten fruit @ ⇒ Na Meta bisulfite  
Crime scene

\* Uric acid crystal ⇒ Alcohol

\* Virological examn ⇒ 80% glycerol

\* DNA ⇒ Nucleated

Blood → EDTA vials

Hair → Plucked

Spleen

Muscle

Formalin

↓  
Used as preservative  
in HPE.

Blood for culture

↓

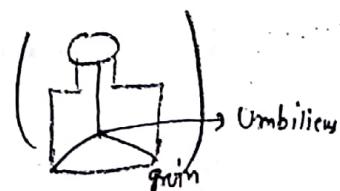
SPS

(Sodium Polyanethole  
Sulfonate)

### FETAL AUTOPSY

Gnision ⇒ Mc ⇒ "I" shaped

Preferred ⇒ Inverted "Y" shaped



technique for operating fetal skull ⇒

Beneke's technique ⇒ 2 Flaps

Baars technique ⇒ 4 Flaps



Haase's Rule

Up to 5 months

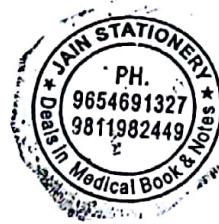
CHL = 25 cm  
Crown Heel Length

$$\text{Age (Mths)} = \sqrt{\text{Length (cm)}}$$

Morison's Rule

6-10 months

$$\text{Age} = \frac{\text{Length}}{5}$$

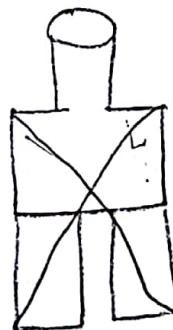


$$\text{Crown Rump Length} = \frac{2}{3} \text{ Crown heel Length}$$

\*

X-Shaped Incision  $\rightarrow$  done in Torture

- kept the body in prone position



Q: Pseudocyesis is usually observed in ?

- (A) Childless wife Needing Menopause;  
(B) Males who are infatuated to a particular woman;  
(C) Unmarried woman in whom contraceptive has failed;  
(D) Young Married woman  $\in$  illicit sexual Relation  $\in$  colleague

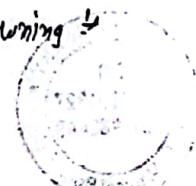
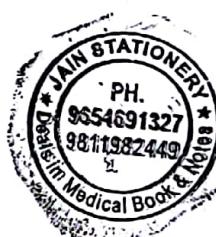
Q: Initial damage to carotid A. is a/w death of ?  $\rightarrow$

- (A) Hanging  $\in$  a drop; (B) Ligature strangulation; (C) Manual strangulation;  
(D) Traumatic asphyxia

Q: Following are the characteristics of Ligature Mark of fixed Noose in hanging except that they: (A) Are oblique; (B) are continuous; (C) are high up on the Neck;  
(D) Show parchmentization

Q: 7e in what is suggestive of Antemortem drowning  $\rightarrow$

- (A) Sputum; (B) Mg; (C) K; (D) ca



1) Position of diaphragm  $\rightarrow$  3-4<sup>th</sup> Rib  $\quad \quad \quad$  6-7<sup>th</sup> Rib  
(That's why we open abdomen 1<sup>st</sup> in antacid)

1) Fodere's test / static test  $\rightarrow$  30-40 gm  $\quad \quad \quad$  60-70 gm  
(Weight of Lungs)  
why? b/c of blood

1) Plouquet's test  $\rightarrow$  1:70  $\quad \quad \quad$  1:35  
Ratio of wt of Lungs : wt of body

1) Breslau's 2<sup>nd</sup> Life test  $\rightarrow$   $\ominus$   $\quad \quad \quad$   $\oplus$   
(Air in stomach)  $\quad \quad \quad$  (Not present)  
(Air is present)

1) Werbin's test  $\rightarrow$   $\ominus$   $\quad \quad \quad$   $\oplus$   
Air in Middle ear

Hydrostatic Flotation test  $\quad \quad \quad$   $\ominus$   $\quad \quad \quad$   $\oplus$

Q) Raygar's test

"irev" as CONTROL

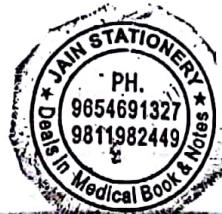
+ for Residual Air

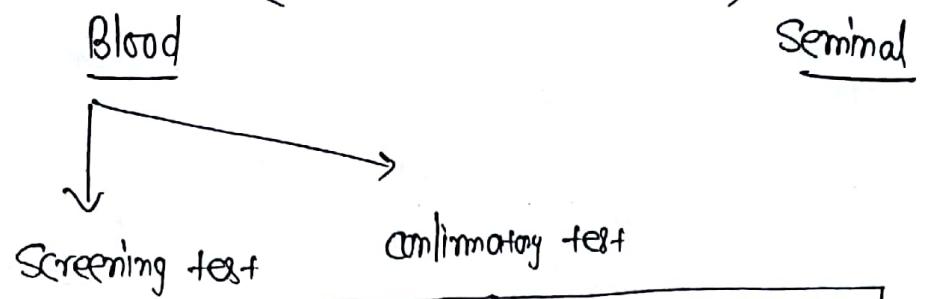
SIB False  $\oplus$  Raygar's test

- Artificial ventilation
- Decomposition

LIB False  $\ominus$  Raygar's test

- Feeble Respiration
- Alveolar Membrane (prevented Air entry into alveoli)
- ARDS
- Atelectasis.





### Benzidine (Alder's test)

- give deep blue colour
- Most : sensitive
- Not used now a days

4 blc of carcinogenic Nature

### Bladder cancer

- old blood stains (used for)

### CONFIRMATORY TEST

#### Microchemical test

##### Hemin / Feichman

Brown Rhombic crystal

(Glacial Acetic Acid)  
+  
NaCl  
ie Glacial acetic Acid

#### Spectroscopy

Best & Most sensitive test

##### Hemochromogen / Takayama

Pink leather crystals



a) In UV Light  $\Rightarrow$  Blue/ white coloured Fluorescence

$\rightarrow$  diff choline in serum

b) Chemical test

Florence



Brown Rhombic  
crystal of choline  
beta Iodide

Balberio's



Needle state Rhombic crystal  
of skermine  
biprate

Acid Phosphatase  
 $\downarrow$   
Besi + test

c)

Microscopy (Besi)

Confirmatory test

↳ b/c even a single chromatoga can be seen.

christmas tree stain

d)

LDH isoenzyme assay

- gnd Besi

e)

$\beta$ 20 | PSA

f)

MHS-5

g)

CPK - old seminal stains - up to 6 months old

Vagitus vaginalis  $\Rightarrow$  cry of Unborn child in Vagina

↳ Not say child is live birth; b/c child not coming out.

\* Under which section Infanticide Punish  $\Rightarrow$  Sec. 302; Sec. 315

Vagitus uterinus  $\Rightarrow$  cry of child in Uterus.



• examination of Hair can tell  $\Rightarrow$  is Identification  $\Rightarrow$  of individual (accused; victim);

ii) Source of origin  $\Rightarrow$  whether is of Human OR Animal

Human Hair

• Fine & thin

• Medullary Index  $< 1/3$

$$\left( \frac{\text{Width of Medulla}}{\text{Width of cortex}} \right)$$



Animal Hair

• Coarse & thick

$> 1/2$



• Evenly distributed pigment

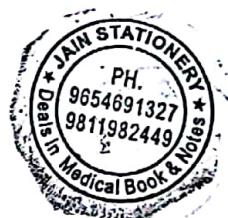
•  $\oplus$  Near the Medulla

iii) Sexual offences:

iv) Crime:

v) Hit & Run case:

vi) Identification of Race by hair:



INDIAN

• Straight; black;  
Long & fine

CHINESE & JAPANESE

• Straight; black,  
Long & thick

EUROPEANS

• Straight;  
Light Brown;  
Raddish grey  
& short

NEGRITES

• Wooly;  
curly;  
black;  
short & thick

### LEGITIMACY

(A) Superfecundation  $\Rightarrow$  Two ova Released in same cycle; Fertilized; either during same act of coitus or during the separate acts.

• Possibility of twin having two fathers

(B) Supertetation  $\Rightarrow$  During the continuation of development of fetus; Another ova Released in subsequent cycle get fertilized & starts developing as a second fetus,

Can Result in  $\Rightarrow$  Twin having two fathers;  
Two children being born together in different stages of development;  
Female may deliver twice in 1-3 Months

(C) Supposition child  $\Rightarrow$  Fictional claim of child

(D) Posthumous child  $\Rightarrow$  child born after the death of his biological father

— Drugs & cosmetics Act, 1940 (Main aim is to control quality, purity & strength of drug).



Drugs & cosmetics Rule ; 1945 Father of Modern toxicology



### Schedules

C

Biological agents

E.

Poisonous Substance

F

Vaccines & sera

H

Prescription drugs

JIPMER

S

Standard of cosmetics

Mathieu orfila.

Best Emetics to vomit the ingested Poisons



Syb. of Ipecac  $\Rightarrow$  30ml

Best Purgative  $\Rightarrow$  Sorbitol

↳ Loosen stools & res bowel Movements.

— Best Diaphoretic  $\Rightarrow$  Pilocarpine

↳ for sweating & eliminated poison by sweat

### Antidotes

#### Physical / Mechanical

1. Bulky food

↳ for Glass Metal

2. Demulcent

↳ Acids

3. Activated charcoal

↳ MoA  $\Rightarrow$  Adsorption

#### Chemical

1. KMnO<sub>4</sub>  $\Rightarrow$  Opium;

Phosphorus:

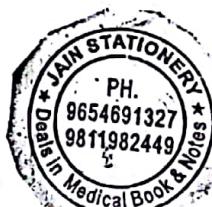
#### Physiological

1. Receptor

Datura  $\Rightarrow$  Physostigmine

Opium  $\Rightarrow$  Naloxone

Chelating agent



Activated charcoal

Tannic acid

MgO  
Acids:

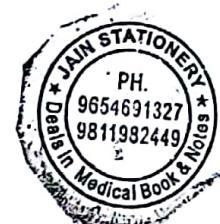
bpt. alkaloids

2 : 1 : 1

Activated charcoal formed after passing steam over charcoal by which  
penetrates & Adsorption to

C/I  $\Rightarrow$  Corrosive, Alcohol, Heavy Metals  $\Rightarrow$  except Hg

### Gastric Lavage



Tube

Children

Ryle's tube

MLC  
Ewald | Boas | Edlich

Adults

Bell

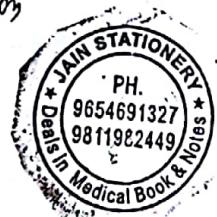
Lavage tube

Best Position to do Gastric Lavage  $\Rightarrow$  Left Lateral

Best Fluid to start Gastric Lavage  $\Rightarrow$  Plain water

MLC Fluid used in Gastric Lavage  $\Rightarrow$  Normal saline

KMnO<sub>4</sub> used in 1:5,000 dilution  
in alkali Poisoning



Golden Period for doing Gastric Lavage  $\Rightarrow$  < 3 hrs

$\rightarrow$  C/I  $\Rightarrow$  Corrosive  $\Rightarrow$  cause perforation  $\Rightarrow$  except  $\Rightarrow$  Phenol /

Carbolic acid

Leathery / thickened



Convulsant | Anticonvulsant

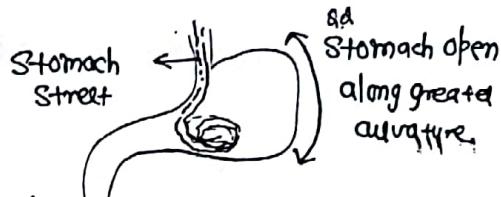
Coma

Hypothermia

Lower esophageal varices

Magenstrasse  $\Rightarrow$  Stomach Street

↳ Path taken by poison in the Stomach.



### As Poisoning

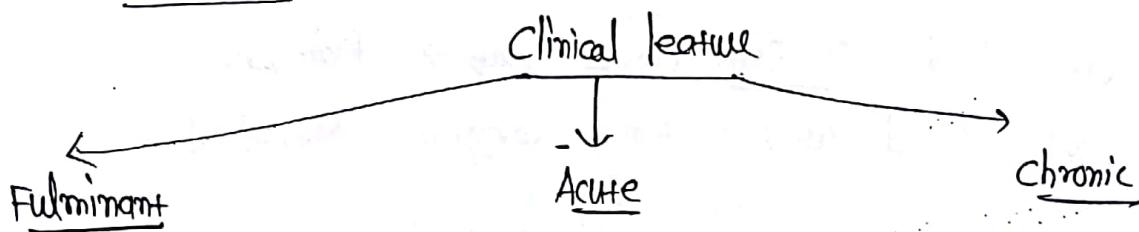
$\text{As}_2\text{O}_3$  — White As; Sankhya

King of Poisons  $\rightarrow$  Fatal dose — 0.1–0.2 gm

Fatal Period  $\rightarrow$  1–2 days

Poison of King  $\rightarrow$  Napoleon died due to As Poisoning

Arsenophagists  $\Rightarrow$  tolerate As upto — 0.3 gm



3-5 gm As consume

Death within 3 hrs

Gastroenteric form

Cholera

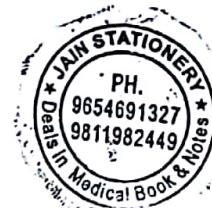
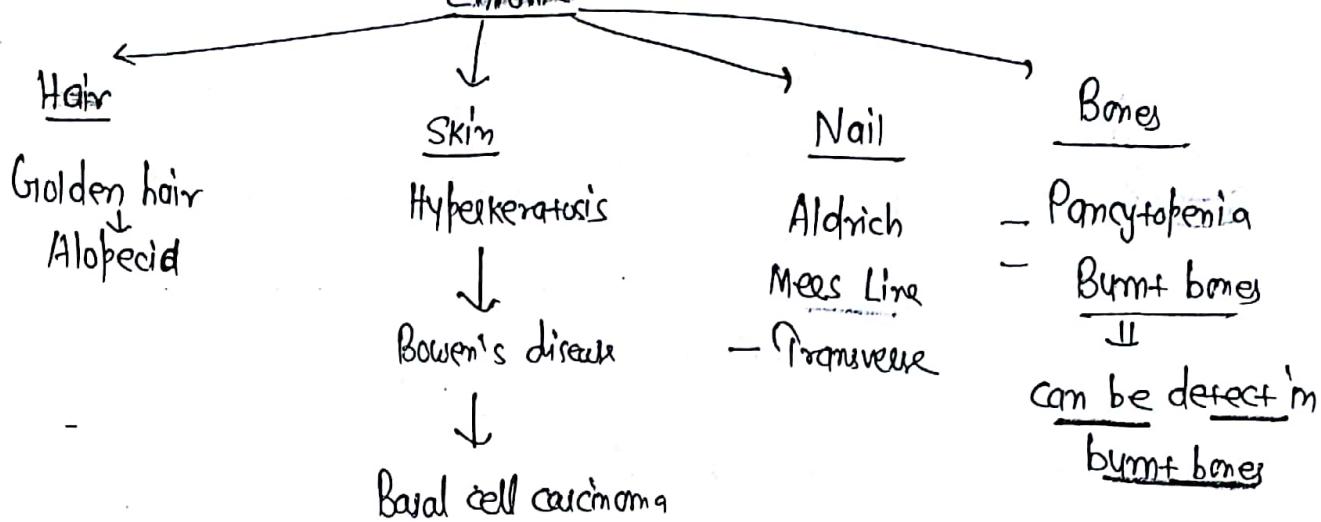
Sequence of symptom  $\rightarrow$

As  
Throat Pain  
vomiting  
purging  
 $\uparrow$   
Cholera

convulsion; coma

Liver  $\Rightarrow$  M/c organ has As (Metabolism)

Kidney  $\uparrow$   
Brain  $\downarrow$   
\* Brain has least amount of As.  
L.I.  $\downarrow$  death rate  $\uparrow$



- also causes Fatty Liver ; Symmetric peripheral sensorimotor Neuropathy ;
- Catarrhal sign  $\oplus$  (Resembles Common cold i.e conjunctivitis ; Running Noses & eyes ; coughing etc)
- Black foot disease  $\Rightarrow$  As Poisoning
- Viscera preserve in As Poisoning  $\Rightarrow$  Hair, skin; nail; bone + Roentgen
- Test  $\Rightarrow$  Reinsch  $>$  - Marsh  $>$  Grutzef
- Rx  $\Rightarrow$  Gastric lavage by Freshly prepared hydrated Ferric oxide  $\xrightarrow{\text{POC}}$   $\xrightarrow{\text{BAL}} \text{Dimer control}$   $\xrightarrow{\text{blc cause fat embolism}}$ 
  - $\hookrightarrow$  Deep i.m. (Not I.v.)
  - $\hookrightarrow$  C/I in  $\Rightarrow$  Fe, cd; selenium
- PM appearance  $\Rightarrow$  Stomach - Red Velvetty;  
Heart - Subendocardial Hemorrhage
  - $\hookrightarrow$  also in Aluminum phosphide poisoning,



## Thallium

↳ Resembles "Gullion - Barre Syndrome"

Peripheral Neuropathy

Alopecia

Skin Rash

M/c Homicidal Poison  $\Rightarrow$  As

ideal Suicidal Poison  $\Rightarrow$  (CN) Painless death;

M/c Suicidal Poison  $\Rightarrow$  OPC

M/c Method of Suicide  $\Rightarrow$  Hanging

Para-suicide  $\Rightarrow$  M/c  $\Rightarrow$  Drug ingestion

↳ मरना चाही, फिर सर्वांग

## MERCURY

### Organic Mercury

• Methyl Mercury

↳ Most poison

↳ Minimata disease

### In-organic Mercury

$HgCl_2$  - 1-4 gm

↳ Fatal dose

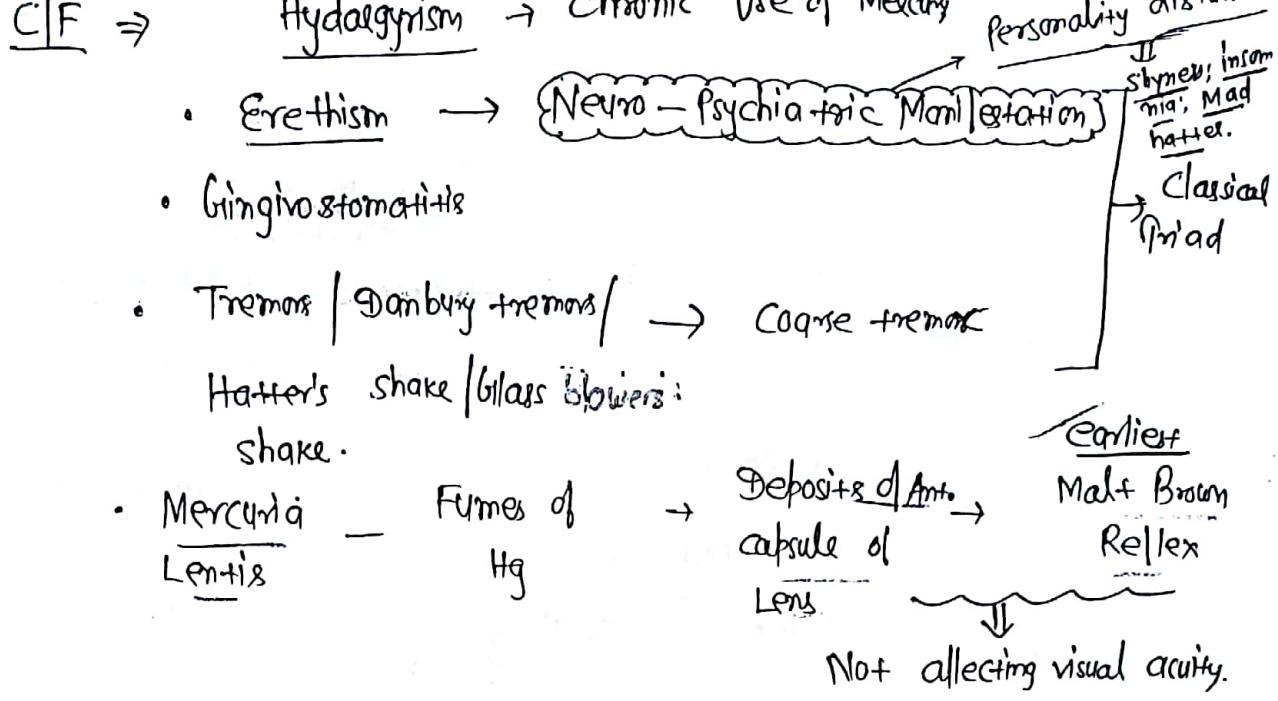
Mercurialism  $\rightarrow$  i.v. mercury inf.

Thrombophlebitis

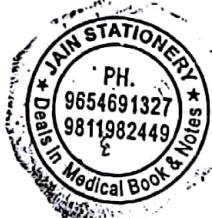
Ganguloma

Pulmonary emboli





- Strawberry tongue
- Diphtheria like coatis
- Acrodynia | Pink ds <sup>ca</sup> (Idiosyncratic HSN Rx<sup>n</sup>)
- causes Proximal convulated tubules
  - ↳ other drugs ⇒ Phenol
  - CCl<sub>4</sub>
  - Oxalic acid
  - Cadmium
  - ↳ also cause Bone Pain & Muscular Pain
  - ↳ cause "Ouch-Ouch ds"
  - Golden Yellow staining of teeth
  - Rx ⇒ N-acetyl penicillamine



Viscera Preserve → R/V + Hair  
 Routine viscera  
 Rx ⇒ G/L ⇒ sodium formaldehyde sulphoxylate  
 Agent of choice ≠ BAL

LEAD  $\Rightarrow$  No heavy Metal is Poisonous in Native form  
except  $\Rightarrow$  Lead

- Lead acetate (sugar of Lead)  $\Rightarrow$  Fatal dose  $\Rightarrow$  20 gm
- Lead carbonate  $\Rightarrow$  Fatal dose  $\Rightarrow$  40 gm
- C/F  $\Rightarrow$ 
  - Anemia
  - Eosinophilia
  - Basophilic stippling
- Lead lines in Metaphyseal plate  $\Rightarrow$  Recurrent Gouty Arthritis

(. Chronic poisoning  $\Rightarrow$  Plumbism / saturnism )

- Brownish Lines  $\Rightarrow$  Blue Lines @ teeth & gum junction
  - ↳ Seen also in  $\Rightarrow$  Hg; Bi; Ag; Fe; Cu
  - ↳ Kfus "Clapton Lines"

- Cabot's Ring  
ie Abdominal Pain
- Colic & constipation seen; very rarely diarrhoea.  
 $\hookrightarrow$  dry belly ache
- Encephalopathy  $\Rightarrow$  M/c in children
  - ↳ Mainly dl + Tetraethyl Lead

- Pure Motor Neuropathy  $\Rightarrow$  Least complication of Lead Poisoning
- Sterility  $\Rightarrow$  In both sex
- Wrist & foot drop  $\Rightarrow$  Lead Palsy
  - ↳ dl + peripheral Neuropathy
  - only in 10% of cases



Diagnosis  $\Rightarrow$  By Measure

Blood Lead level  $> 10 \text{ mg/dl}$

- Urine test  $\Rightarrow$  Test Coprotoporphyrin (CPU) Levels; of 0.25 mg/L of Lead

Rx  $\rightarrow$  1. Succimer / DMSA

is diagnostic

Given orally; Least Nephrotoxic; useful in  
G6PD deficiency

2.  $\text{Ca}_2 \text{EDTA} + \text{BAL}$

3.  $\text{Ca}_2 \text{EDTA}$

Gm - Lead Encephalopathy; if it is ABC

Least toxic compound of Lead  $\Rightarrow$  Lead Sulphide

Most toxic compound of Lead  $\Rightarrow$  Lead Acetate



### Zinc (Metal Fume Fever)

- Resembling Malaria chills; No wheezing
- Self-Limiting Influenza-like syndrome

### Mn (Manganese)

- Parkinson's Like disease

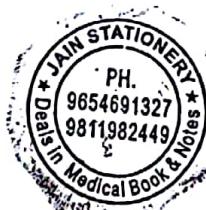
### Iodine

- Painful Parotitis resembling Mumps

Rx  $\Rightarrow$  BAL  $\rightarrow$  Penicillamine Copper  $\Rightarrow$  As a Metal Non-poisonous.

Copper Subacetate  $\Rightarrow$  FD: 15 gm / FP  $\Rightarrow$  1-3 days

Copper sulphate  $\Rightarrow$  FD: 30 gm / Blue-green vomitus; Purple (blue-green) line



Lethal dose  $\Rightarrow$  60-100 mg  $\leftarrow$  PHOSPHORUS  $\Rightarrow$  Protoplasmic poison

Red

- Not toxic
- Used in Match boxes

White/yellow  
— toxic

Spontaneous combustion  
 $(T > 34^\circ\text{C})$

Stored Under  
water

Divali  
Poison  
II

Arson  
II

Burning of chhatri in old  
days.

also Hg

Pharaoh's serpent  $\Rightarrow$  Mercury thiocyanate  
↳ पुत्राचार सोप की नरें गिराये

- Acute Phosphorus poisoning :

C/F  $\Rightarrow$  Luminiscent

vomitus

Smoky

Stool  
syndrome

Acute yellow  
atrophy of Liver

- Chronic Phosphorus poisoning :

C/F  $\Rightarrow$  Phossy jaw | Glassy jaw

Osteonecrosis of jaw

↳ M/c  $\neq$  Mandible involved

Fumes of phosphorus  $\Rightarrow$  White phosphorus

Rx : No specific Antidote

KMnO<sub>4</sub>,  
vit. K



## Abrus precatorius (Ratti)

Seeds - wt  $\Rightarrow$  108 mg  $\hookrightarrow$  Kau "Gunchi"; crab eye; Rosey tea".

Active principle  $\Rightarrow$  Abrin  $\Rightarrow$  it is Toxalbumin & Ricin; Crotin

$\hookrightarrow$  Resembles Viper venom

$\hookrightarrow$  Vasculotoxic

Medico-legal importance  $\Rightarrow$  Making "Suis"

$\hookrightarrow$  used to look like viper bite (..)

Artificial Bruise  $\Rightarrow$  used to cheat falsely

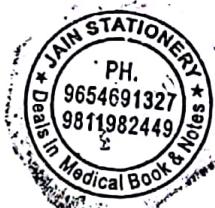
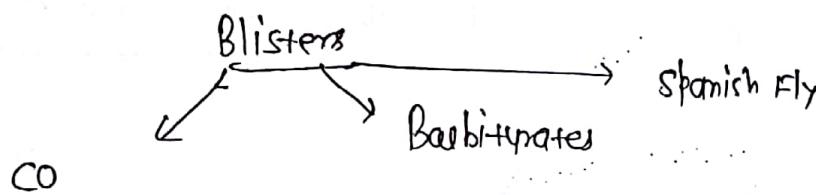
(A) Semicarpous Anacardium ; (B) calotropis; (C) plumbago; (D) Dithriol  
(Mango Nut)  $\hookrightarrow$  Active Principle  $\Rightarrow$  Semecarpol & Bhilawol  $\Rightarrow$  A/P  $\Rightarrow$  Gigantin (NEETI)

Used by washerman to mark clothes.  $\hookrightarrow$  Spanish Fly | Cantharides | Blister beetle

Active Principle  $\Rightarrow$  Cantharidin (Afrodisiac)

$\downarrow$   
↑ Es the sexual desire

- CIE  $\Rightarrow$  Priapism - Persistent ~~painful~~ penile erection  
 $\hookrightarrow$  also seen in Scorpion sting



## Carbon Monoxide (CO)

Anemic Anoxia (b/c it reacts 200 times more tightly w/ Hb than O<sub>2</sub> & causes anemic type of hypoxia). AIY

CIE  $\Rightarrow$  1st (4+) - Headache

\* 40-50% CO - A/C intoxication (symptom rebalance)

\* 80% CO - Death due to Respiratory arrest.



(10% NaOH)

Rx  $\Rightarrow$  Hyperbaric Oxygen.

PM  $\Rightarrow$  Degeneration of Globus Pallidus; Fine both @ Mouth & Nose;  
examination Bright-cherry red discolouration.

\* Upper Limit of safety of CO in Air  $\Rightarrow$  0.01%.

## BARBITURATES

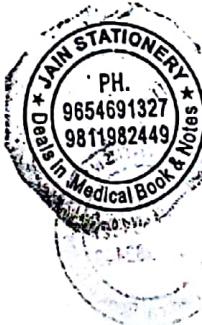
- Hypothermia, Coma; Non Reactive pupil
- ~~fx:~~ Forced Alkaline diuresis ~~as~~
- Automatism  $\Rightarrow$  Accidental self poisoning
- Golden Urine  $\Rightarrow$  Urine is golden in colour

Liquid gold

$\hookrightarrow$  Urine of Ammphetamine Abusers

$\hookrightarrow$  Hot Unchanged base in Urine

        ||          
after selling it; we can earn Money.



## ELAPIDAE

- COBRA (*Naja naja*)
- COMMON KRAIT (*Bungarus caeruleus*)

## VIPERIDAE

- RUSSEL'S VIPER (*Vipera Russellii*)
- SAW SCALED VIPER (*Echis carinatus*)

Rx :-

### Anti-Snake venom

↳ Not used in "Hyphale hyphale"

bited

↳ "Hump Nose Viper"

## COBRA

## COMMON KRAIT

## RUSSEL'S VIPER

## SAW SCALED VIPER

Neuro-toxic

Vaso-toxic

Sea-snakes (Hydrophid) → Myotoxic

## Poisonous Snake

2 fangs & multiple teeth

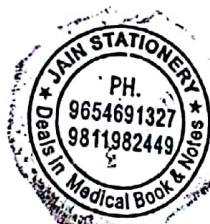
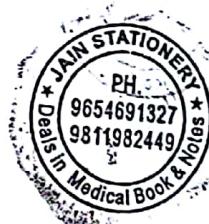
→ Head scales - Small

Nocturnal habits

→ Body scales - Large



Tail → compressed



— AFIM | MADAK | CHANDU

— Umbe fruit of Papaver Somniferum

— Bhuki

↓

Drug obtain from  
"POPPY HUSK"

Lancing

↓



Longitudinal incision on  
fruit for opium

— C/F ⇒ Drowsiness; Resp. disorder; Pin point Pupil; Coma

— withdrawal feature ⇒ Drowsiness; Rhinorrhea; Lachrimation; Goose flesh,  
Mydriasis (dilated pupil); Insomnia; Yawning; Muscle

— Fatal dose ⇒ Opium - 2 gm Cramp & body pain; Rise in BP.  
Morphine - 0.2 gm

— Dx ⇒ Malign's test

— Rx ⇒ G/L - KMnO<sub>4</sub> - 1:500

↳ DOC ⇒ Naloxone (i.v.) || b oral Naltrexone

— Rx of withdrawal ⇒ Methadone (DOC)

↳ for Maintenance therapy.

### HEROIN (M/c abwed opioid).



— SMACK; JUNK; SOPE; BROWN SUGAR



— Diacetyl Morphine

— Designel drugs

— Shooting galaxy ⇒ Authorised place where to administrate the drug  
↓

i.v. ⇒ Mainlined; shot



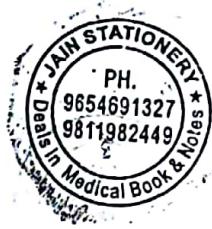
## Chaining of the dragon

Rx → clonidine;

Butyro-morphine;

Pentazocine.

AlP → Levohyoscymine; Hyoscyamine (scopolamine) & Atropine.



### STUPEFYING AGENTS

Datura → earliest symptom  
↓  
Bitter taste in the Mouth.

Roadside Poison

Datura → Thorn Apple  
Solanum

Fatal dose → 100 seeds

Resembles → chilli seeds  
Human's hand

Embryo of Datura → curved outwards  
(2)

Embryo of chilli → curved inwards  
(6)

C/F → Dilated Pupil → Diplopia  
Dry hot skin → Hyperthermia

Delirium → Muttering  
Pill Rolling Movement  
Caphologia

Rx → Physostigmine

Cocaine

Coke, Snow; Cadillac; White lady

Snorting

Cannabis

Smoke

CRACK

↳ Max<sup>n</sup> size of cocaine  
clt smoke

Half-lked cocaine → 1 hr.

Cocaine + Heroin → Speed ball

C/F → Black tongue & teeth

Perforated Nasal septum

Excited delirium

Hallucinations (Visual > tactile)

Magnan's symptoms / cocaine bugs

Formication → Any Hallucination who involve insects  
↳ also seen in

(A) Ergot poisoning → St. Anthony Fingers

(B) As porcine

(C) Atropine like Rx → Resembling sciatica

Active Principle  $\Rightarrow$   $\Delta^9$  - Tetra hydro cannabinol

Smell  $\Rightarrow$  Burnt Rose Smell

Marijuana cigarette | Reeffers | weed | joint  $\Rightarrow$  1-6 hrs



Preparation from cannabis Active Principle

Bhang  $\Rightarrow$  Dried leaves  $\Rightarrow$  15%

Majoon  $\Rightarrow$  Sweet (Bhang)

Ganja  $\Rightarrow$  Flowers (Female)  $\Rightarrow$  25%

Chas  $\Rightarrow$  Resin (stem)  $\Rightarrow$  40%

Hashish

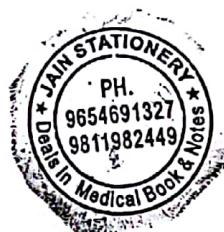
C/F  $\Rightarrow$  i) Run Amok  $\Rightarrow$  Impulse to kill

$\downarrow$  Person is Responsible for crime  
 $\downarrow$  b/c insight  $\oplus$

ii) Amotivational Syndrome  $\Rightarrow$  Apathy; Loss of interest; Reduced drive

\* Least toxic : Flashback phenomenon;  $\Rightarrow$  person experience the feeling of cannabis we didn't actually wing it.  
Bhang : Fatal dose: 10 gm/kg Body wt.

\* Most toxic : Chas : Fatal dose: 2 gm.



1. LSD  $\Rightarrow$  Purple heart; Mind expander; Golden dragon,

$\hookrightarrow$  Pt. hear the colour? - Synesthesia

$\hookrightarrow$  Mixing of sensation

- taking a trip

- Flashback phenomenon

$\hookrightarrow$  also in cannabis.

2. Angel-dust  $\Rightarrow$  PCP / Phencyclidine

3. Rave drugs  $\Rightarrow$  M|c  $\Rightarrow$  Ecstasy (MDMA)



GHB

LSD

Amphetamine

Methcathinone  $\Rightarrow$  cheaper & alternative to ecstasy

$\hookrightarrow$  (Meow - Meow)

Ketamine

4. Predator drugs / Date Rape drugs  $\Rightarrow$  M|c  $\Rightarrow$  Alcohol



Barbiturates



Rohypnol (Flunitrazepam)

Chloral hydrate (Knockout drds.)

Mickey Finn



combination of  
Alcohol & chloral  
hydrate

~~XXX~~ Japanese detergent Suicide  $\Rightarrow$

H<sub>2</sub>S gas

~~JIMER~~ Hair dye Poisoning  $\Rightarrow$

di + β-phenylenediamine

Cause

Allergic rxn; Renal failure

Sewer gas

$\frac{H_2S + CO_2 + CH_4}{II}$

- In all cardiac Manifestation Rate/Rhythm



Rx  $\Rightarrow$  Atropine | symptomatic

- but in Amblyopia



Tobacco  $\Rightarrow$  Smoker's heart

- Respiratory Sympt  $\Rightarrow$  Cyanide  $\xrightarrow[\text{2 enzymes}]{\text{Inhibits}} \text{CO}_2 + \text{O}_2$   $\xrightarrow{\text{Carbonic Anhydrase}}$

↳ Histotoxic Anoxia

Achlorhydric individuals - Gummie

Double salts are Non-toxic

KCN - ED - 0.2-0.3 g.

FP - 2-10 min

"Lee Jones Test"



Used for cyanide poisoning;  
to differentiate from  
Salicylate Poisoning.

Rx  $\Rightarrow$  Inhalational Amyl Nitrite,  
Sodium thiosulfate,  $\xrightarrow{\text{ELI LILY KZT}}$   
Hydroxocobalamin;  
(Di cobalt EDTA)

$\rightarrow$  Gynaecomastia; Trigeminal Neuralgia  $\Rightarrow$  Digitalis Poisoning

Around Periodontal Region

Hippus  $\Rightarrow$  Aconite Poisoning

↳ Ringing sensation

Chest Pain

Hyper salivation

Hypotension



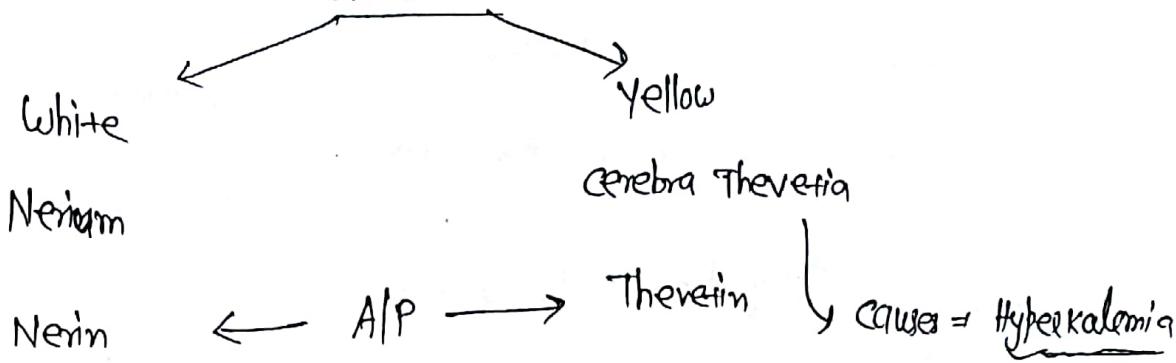
Kla "MONKS HOOD/ Mitta bish (MHO)/  
Blue Rocket".

↳ Roots is most potent b/lb seed.

FP  $\Rightarrow$  2-6 hr QD

↳ death dt+ paralytic of Respiratory center





Q. Asphyxial death  $\equiv$  black colour Mucosa  $\Rightarrow$  Cyanide Poisoning

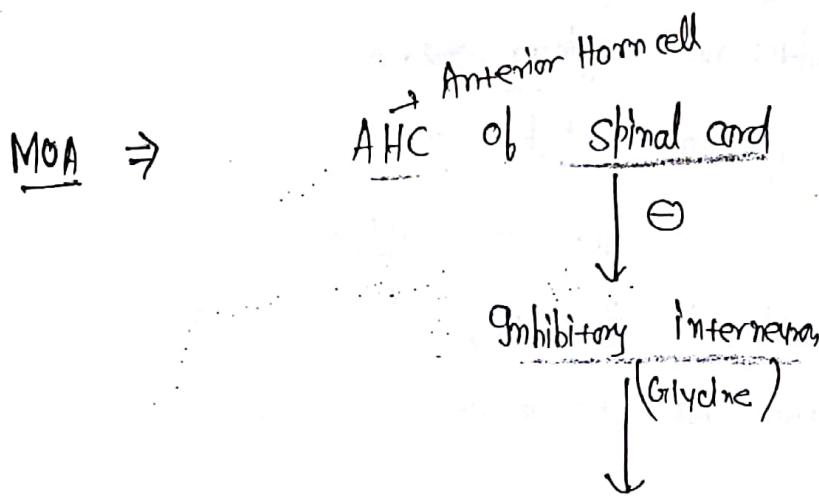


### SPINAL POISONS

Strychnine      Nux vomica | KUCHILA

AlP  $\Rightarrow$  Strychnine ; Brucine

Fatal dose  $\Rightarrow$  1 crushed seed (Unmashed seed is Not digested)



C/F  $\Rightarrow$  All muscles are affected @ same time  
consciousness - clear b/w convulsions (GTC)

Backward Arching of Spine

B. Emphysema

Forward Bending

C. Pleurostethotomy

sideways Bending

R

⇒ Diageform; closed dark Room

Antidote for strichnine Poisoning ⇒ Short Acting Barbiturates  
↓  
Phenobarbitol.

Aluminium Phosphide (Alphos / celphos)

Each tab - wt ⇒ 3 gm (3 gm of Aluminium phosphide liberates 1 gm of phosphine).

↓  
Aluminium phosphide = 56%.

Phosphine gas ⇒ 1 gm FD

- MoA ⇒ Inhibits cyto-c oxidase

- CF ⇒ esophageal stricture; Myocardial Necrosis

- Rx ⇒ Symptomatic hypomagnesemia

- Dx ⇒ Silver Nitrate Paper test

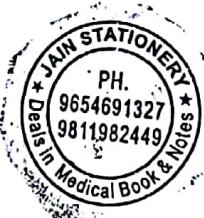
↓ give Black colour

- PM ⇒ Subendocardial hemorrhage

Flame shape hemorrhages

→ Mc cause of death ⇒ Cardiogenic shock

\* Aluminium phosphite & hypophosphite are Non-toxic salts



Acid

? More dangerous

Alkali

coagulative  
Necrosis

Stomach

doesn't cause

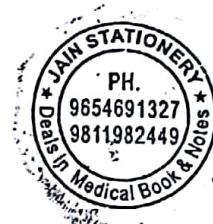
by "HF"

↓ damage by "Liquefactive Necrosis"

Muc damage organ

Liquefactive Necrosis

Esophagus



Vitriolage (Acid Attack)

326(A) IPC



Acid attack

10 yrs + Life imprisonment

326(B) IPC



Attempt to acid attack

5yr to 7yr punishment.



SULPHURIC ACID (oil of vitriol)

Everything black except teeth → chalky white

FD → 5-lone

FP → 12-24 hr

↙ Gastric Perforation - Common wet blotting paper like consistency

Rx ! →

weak alkali; MgO

steroids ↴ b/c we can't neutralize strong acid & strong alkali  
(as it is Exothermic).

↳ Prevents Long term complication like Esophageal stricture

Cos esp. children ⇒ Reflex vocal spasm

### Nitric Acid

- Stains all the GIT & tissue in yellow colour

↓  
"Xanthoproteic Reactions"

- Brown discolouration of Urine.

- Inhalation of fumes ⇒ Lacrimation

Photophobia



### Boric Acid

A/w "Boiled Lobster syndrome":



### Oxalic Acid (salt of same)

- Used to Remove Ink for forgery.

C/F ⇒ PCP damage,

Hypocalcemia,

Oxaluria ⇒ Enveloped shape crystals

Rx ⇒ 10% ca gluconate 10 ml i.v.

C/I ⇒ Large Amount of water



- Miosis
- Lock jaw
- Delayed Putrefactions  
↳ also by Antimony; Zinc

- Carboluria

↳ colourless  $\xrightarrow[\text{standing}]{\text{on}}$  Green

↓ + hydroquinone;  $\xrightarrow{\text{oxidized}}$   
Pyrocatechol in Air

- Occhronosis (Blackish pigmentation of cartilage)

Chronic - Phenol Marasmus

Rx  $\Rightarrow$

Hemodialysis

Also indicated in

B Barbiturate  
L Lithium  
A Alcohol  
S Strychnine  
T Theophylline

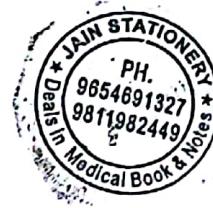
Cl in

K Kerosene  
B Benzodiazepine  
C Copper sulphate

\* Colour of Stomach Mucosa in different Acid poisoning:  $\Rightarrow$

Black	$\rightarrow \text{H}_2\text{SO}_4$
Yellow	$\rightarrow \text{HNO}_3$
White	$\rightarrow \text{HCl}$
Brown/Leathery	$\rightarrow \text{Phenol}$

All these damage caused by  
coagulative Necrosis





- Wood Alcohol

Accumulation of Formic Acid  
↓

- Formic Acid

Lactic Acidosis / High Anion gap Metabolic Acidosis

C/F

- Abd. cramps

optic Neuritis (irreversible)

ED

- 60-200 ml

Hooch tragedy

Rx

• Formetiazole  $\Rightarrow$  4-Methyl Pyrazole

↓

Inhibits alcohol dehydrogenase

if doesn't work

• Ethanol  $\Rightarrow$  given both as i.v. / oral

• Hemodialysis, Blc it competitively inhibits the conversion of Methanol to Formic Acid.

\* Folic Acid or Folinic acid enhances the metabolism of Formic Acid to CO<sub>2</sub>.

\* Methanol concn is high in "Illicit Alcohol". Illicit  $\Rightarrow$  Forbidden by Law; Rule or custom.

ALCOHOL  $\Rightarrow$  Rectified alcohol  $\Rightarrow$  90% Alcohol

• Absolute alcohol  $\Rightarrow$  99.5% alcohol

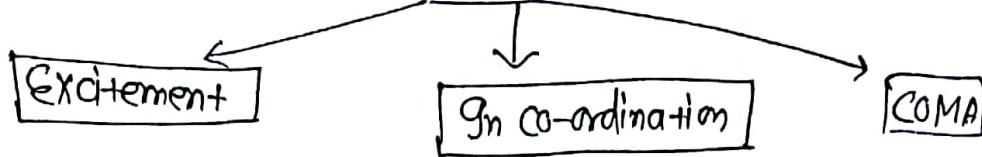
• Maxm alcohol content is prf. In which hard drink  $\Rightarrow$  vodka (60-70%)

• Absorption  $\Rightarrow$  Stomach  $\rightarrow$  20%

Intestine  $\rightarrow$  80%

• Metabolisation  $\Rightarrow$  Liver  $\rightarrow$  90%.





↓ Blood Alcohol Content  
 • BAC < 150 mg-%.

- Alcohol gaze
- Nystagmus
- 40-80 mg-%.

- Under the influence
  - ↳ 80-100 mg-%.

150 - 400 mg-%.

> 400 mg-%

\* 510 I.P.C

↳ Creating Public Nuisance under  
Intoxication is Punishable

↳ 24 hr. jail + 10/- Fine

. Windmark's Formula

$$\{ a = brc \}$$

a = Amount of alcohol in drink

b = body weight

R = constant

c = concn of alcohol in blood

\* In Stage ① & ② : Pupil is dilated

Stage ③ : Pupil is constricted

↳ There is "MacEwans S"

Stimulation of person causes  
pupil to dilate & return to  
constricted pupil.

Q: Where do you expect higher Amoutn / concn of Alcohol?

Blood / Urine (3:4) OR (1:1.33)

• FD = 150 ml of absolute alcohol.

Alcoholic Blackout = 80 - 100 mg-% of BAC

Kozelka & Hine

Cavett's

Test

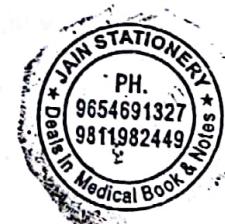
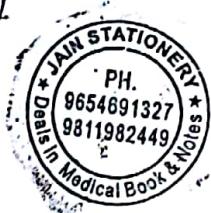
Drunkenometer

Breath Analyser

- Henry's Law (Based on)
- Potassium dichromate

Han chromatogra

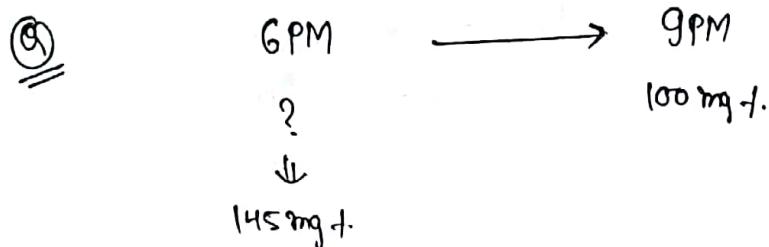
II  
Best.



Limit while driving  $\Rightarrow$   $< 30 \text{ mg/dL}$

Legal age of drinking  $\xrightarrow[45-60 \text{ mL}]{\quad}$  25 yrs.

- Alcohol tends to follow zero order kinetics
- Rate of Metabolism:  $15 \text{ mg/100mL/hr}$



### ORGANOPHOSPHORUS COMPOUNDS

Alkyl phosphatase

- Malathione

- HETP (Hexa ethyl tetra phosphate)

- STEPP (Tetra ethyl pyro phosphate)

Aryl phosphatase

- Parathion (Folliol/Nitroso-mine)

- Paraoxon

- Diazinon (PIK 20)

Irreversible inhibitors of enzyme Cholinesterase by phosphorylating the catalytic site of enzyme. It hydrolyze "Ach".

C/F  $\Rightarrow$  Chromolacryonhea  $\Rightarrow$  Shedding of Red colour tear & + Abnormal porphyrin Metabolism.

Lacrimation: Miosis (pin point pupil); Palmonary edema

Salivation: Muscular fasciculation;

Sweating: Tremor;



Chronic exposure to oil (mineral oil, phosphate)

Additive in Lubricating oil

Delayed Neuropathy  
(1-2 weeks after exposure)

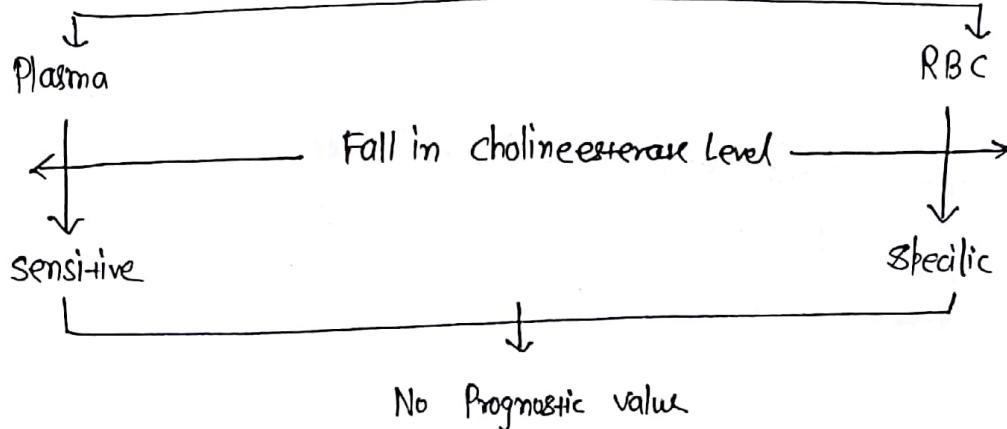
- Alw Demyelination of Axons
- Not caused by cholinesterase inhibition but Rather by Neuropathy Target esterase (NTE) inhibition

Intermediate Syndrome  
(after 1-4 days)

- Muscle weakness
- Caused by cholinesterase inhibition
- doesn't Respond to oximes or Atropines.

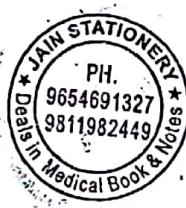
Dx ⇒

Choline esterase Level



Rx ⇒

- ① Activated charcoal;
- ② Mt of choice ⇒ Atropine Sulfate  
↳ causes resp. depression.
- ③ Oximes (Pralidoxime)



- Reversible Inhibitor of Cholinesterase
- Eg ⇒ Physostigmine; Neostigmine; Edrophonium; Carbamyl; Propantheline.

⇒ Rx ⇒ Atropine; Oxime

↳ Not useful



### ORGANOCHLORINES (Chlorinated hydrocarbons)

DDT

Benzene Hexachloride  
(Lindane)

Pyrethrum

Cyclodienes

Eg ⇒ Aldrin;

Dieldrin;

Endrin (Plant Penicillin);

Mirex;

Heptachlor;

Endosulfan;

Chlordane.

Endrin is also known as Plant Penicillin b/c  
of its broad spectrum activity against  
insect pests



- Narcotic Drugs Psycho-trophic Substance Act, 1985.
- It covers only Narcotic & Psycho-tic drugs.
- Nicotine is Not cover under NDPS Act.

NDPS Act : ① Embezzlement of opium is an offence.

↓  
(ज्ञान)

Embezzlement of Any other is Not offence (only opium is an offences).

② This act prefers Rehabilitation of Drug Abusers  
(Not only Punishment; but also)

### DRUG TRAFFICKING

Body Packer @ Body Bag : Person who transport the drug;

Pusher : Person who distributes the drug (distributes to clients)

Stuffer : consume the drug for the fear of being caught.

client/ Abuser : consume the drug for satisfaction.



### COMA COCKTAIL

- Given to pt. who comes  $\infty$  coma  $\infty$  Unknown history.

- Consist of - Dextrose - Hypoglycemia

Naloxone - opioid induced coma

Vit. B<sub>1</sub> / Thiamine - Alcohol induced coma

### DRUGS & COSMETIC ACT, 1940

- Amended by Drugs Act 1964 to "include Ayurvedic & Unani drugs". (AI+U).

AI+U The Label or container of Medicine should display the formula or a list of ingredients contained in the drug.

- CN (cyanide)  $\Rightarrow$  Bitter Almonds  
 Arsenic  $\Rightarrow$  Garlic Like  
 OPC  $\Rightarrow$  Kerosene Like  
 (organophosphates)  
 H<sub>2</sub>S  $\Rightarrow$  Rotten egg  
 ZnP (Zinc Phosphide)  $\Rightarrow$  Fishy  
 Cannabis  $\Rightarrow$  Burnt Rose  
 Nitrobenzene  $\Rightarrow$  Shoe Polish  
Paraldehyde / chloral hydrate  $\Rightarrow$  Acid / Pears  
 ↓  
Klar "DRY WINE"

