



# Infanticide

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# Learning Objectives!

1. Define & Discuss infanticide, feticide & Still birth.
2. Viability of fetus
3. Describe & discuss signs of intrauterine death,
4. Signs of live birth, hydrostatic test
5. Sudden infant death syndrome and Munchausen's syndrome by proxy

# Infanticide



Unlawful destruction of child under the age of 1  
year

# Historical Background



Infant killing was practiced in communities from the origin of humanity .



# Infants killing

- x To reduce population
- x Physically & mentally handicapped children
- x Child sacrifices to please God

# Timeline of Fetus



Fertilization to  
implantation

Pre embryo(14 Days)

Implantation to end of 8<sup>th</sup>  
weeks

Embryo

End of 8<sup>th</sup> week to delivery

Fetus

Birth to 1 year of age

Infant

1<sup>st</sup> 28 days after birth

Neonatal period



## FILICIDE

Killing of child  
older than  
24hours by its  
own parents

## FETICIDE

Killing of fetus at  
any time prior to  
birth

## NEONATICIDE

Killing of infant  
within 24 hours  
of birth



## The English Infanticide Act, Section 1.

“A women by any **wilful act of omission or commision** causes the death of her child, but at the time of act the **balance of her mind was disturbed** by reason of not having fully recovered from the effect of giving birth to the child or by reason of effect of Lactation consequent upon the birth of the child , she shall be guilty of felony of infanticide and will be punished for **manslaughter of child** then.”

In Other circumstances were such that but for this act , the offense would have amounted to murder,

“**Women**”- offence of manslaughter only extends to mother, not father or any other person.

“**cause the death of her child**”- person with separate existence outside the mother’s body.

-child must be under 12 months of age





## Legal Scenario

### IN UK

- X Infanticide Act of England 1938
- X Killing of fetus is not considered as murder .
- X Birth constitute **complete** expulsion of the child from maternal passage

### IN INDIA

- X No Separate law for infanticide
- X Considered as murder punished under **302 IPC**
- X Birth constitute **any part of the living child** coming outs of mothers birth passage



- X Illegitimacy
- X Unmarried girls /widows become pregnant
- X Married women living apart from husband
- X Poverty of parents
- X Occasionally d/t religious superstitions
- X Female feticide/infanticide

*When a case of infanticide comes we have to resolve-*

- x Primary issues
- x Secondary issues

## Primary issues

- X Child was capable of survival after birth
- X Was born alive & had separate existence outside mother's body
- X Death was caused by wilful act or omission. (violence inflicted upon child to be differentiated from accidental injuries related to birth trauma)

## Secondary issues

- X Duration of life of child (degree of maturity)
- X To prove mother has recently delivered. Period of delivery coincides with the probable duration of life of infant.
- X Connection between the identities of the child & the mother required to be traced (ABO grouping & DNA)

# Viability

‘Ability of the child to have separate existence after its separation from its mother’

Age of viability:

**In India = 28 weeks/ 210 days/ 7 months.** Some cases 180 days

In USA = 20 weeks

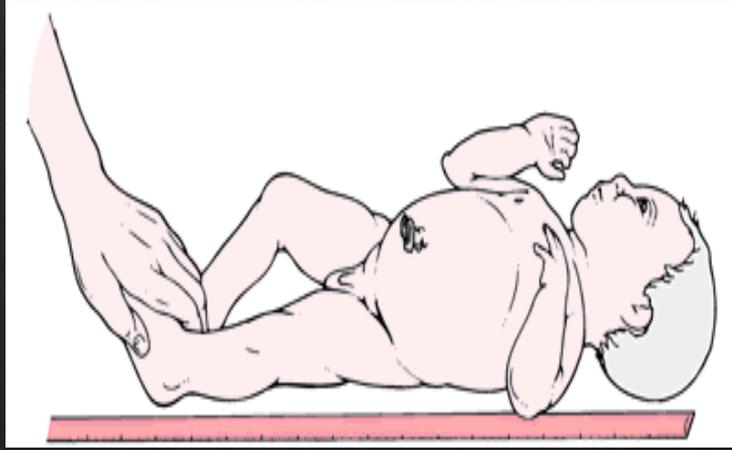
In UK = 24 weeks



# Proof of viability

- X General condition of infant
- X Weight
- X Head circumference
- X Crown heel length
- X Hasse rule
- X Ossification centre





Upto 5 Months (**Hasse's Rule**)

$$\text{Age(mths)} = \sqrt{L(\text{cm})}$$

Last 5 months(**Morrison's Law**)

$$\text{Age} = L \div 5$$

**L = Crown heel length**

## Ossification center's

At 28<sup>th</sup> week

Centre's of ossification  
in calcaneum & talus

At 30<sup>th</sup> week

Sacral vertebrae

At 36<sup>th</sup> week

Lower end of femur

## Ossification centre's in calcaneum & Talus



Courtesy –Dr Shiuli



Dead  
born

Still born

Live born

# Still born

Born after 28 weeks of pregnancy & which did not at any time after being completely expelled from its mother, breathe or show any other sign of life



- x Child was alive in uterus & died during the process of birth or just before.

# Features of still born (signs of prolonged labour)

- Moulding of head

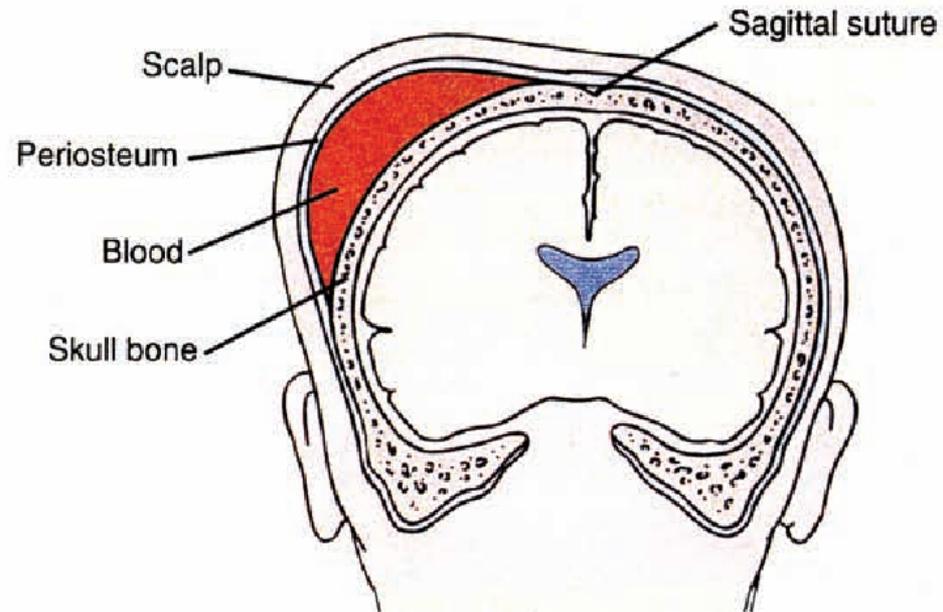
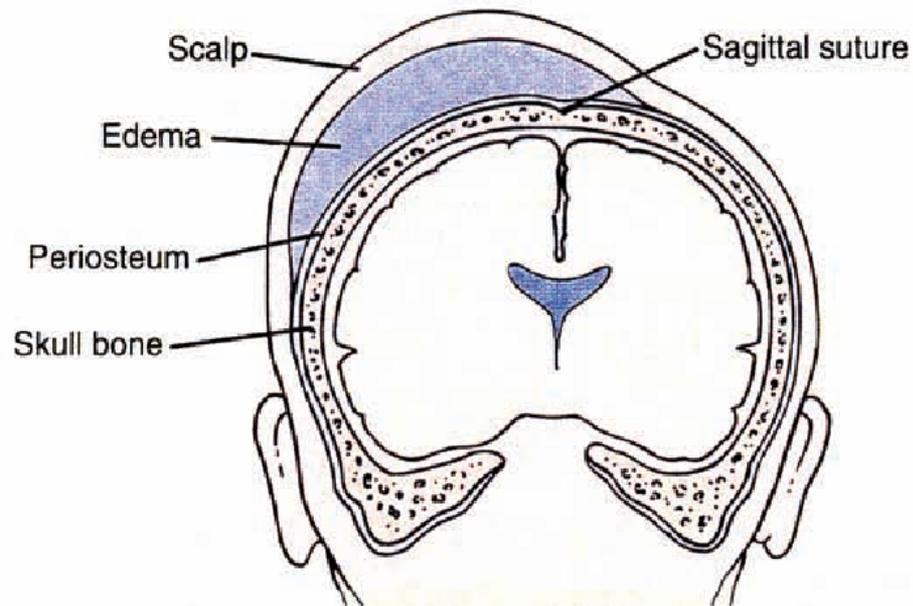


- Edema & bleeding in scalp



- Caput succedaneum





### Understanding the Differences

#### Caput Succedaneum

- Condition marked by localized soft tissue edema with poorly defined outline
- Caused by pressure of the fetal head against the cervix during labor, which decreases blood flow to the area and results in edema
- Present at birth; does not increase in size
- Swelling crosses suture lines
- Disappears after birth within a few hours to several days
- Complications are rare

#### Cephalhematoma

- Condition marked by soft, fluctuant, localized swelling with well-defined outline
- Caused by subperiosteal hemorrhage
- Appears after birth; increases in size for 2–3 days
- Swelling does not cross suture lines
- Disappears from several weeks to even months after birth
- Complications include defective blood clotting, underlying skull fracture or intracranial bleeding, and jaundice



# Causes of Still birth

1. Intrauterine asphyxia
2. Placental abnormalities
3. Toxaemias of pregnancy
4. Erythroblastosis foetalis
5. Intracranial haemorrhage
6. Congenital defects



## Dead Born

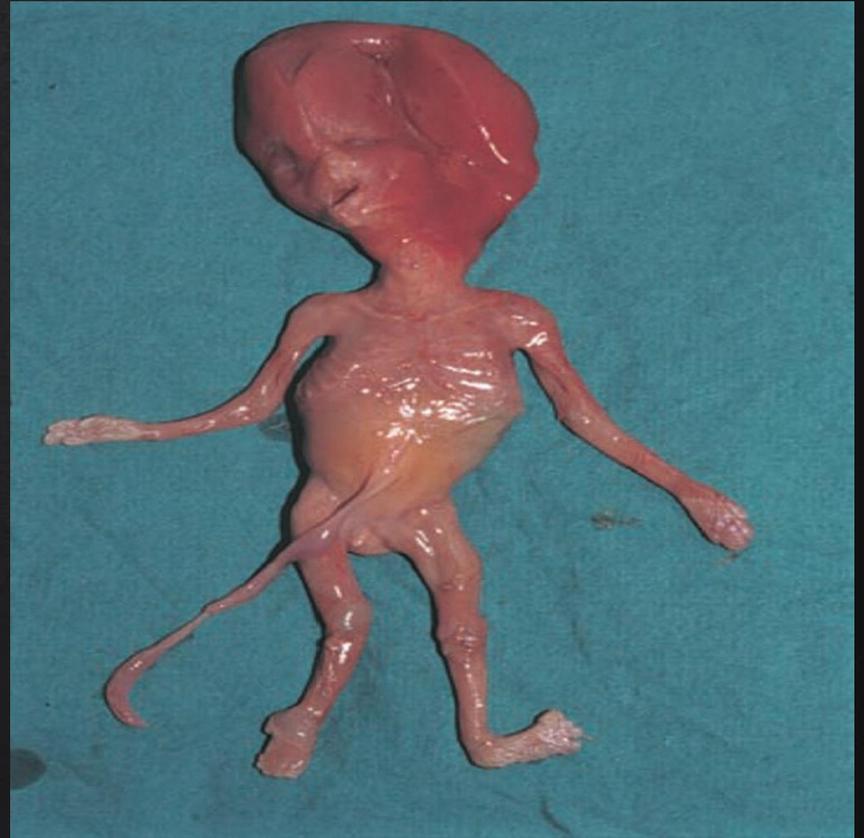
“One who died in utero before the birth process began ”

## Signs of Dead Born

- x Rigor Mortis (**only seen when fetus >9 mnth**)
- x Maceration
- x Mummification
- x Putrefaction

# Signs of Maceration

- X Aseptic autolysis
- X Dead child in utero for 3-4 days
- X Fetus is
  - soft
  - flaccid
  - flattened
  - emits sweetish disagreeable smell



## Signs only seen after 12 hours

- X Earliest is **skin slippage**
- X Reddish or purplish coloration of skin
- X Large blebs containing serous / sero-sanguinous fluid.
- X Epidermis easily peeled off leaving moist greasy area.
- X Turbid reddish fluid in serous cavities



- X Abdomen distended
- X Joints loose & Flexible
- X umbilical cord red & soft
- X Brain grayish ,pulpy
- X Other organ soft
- X Collapse of vertebral column
- X Crowding of ribs
- X Spalding sign
- X Roberts sign
- X Deuel Halo's sign.

# Spalding Sign

- x Loss of alignment & over-riding of bones of cranial vault .
- x d/t shrinkage of brain after death.



# Robert's Sign

- X Presence of gas shadow within heart or the greater blood vessels.
- X Rare sign, caused by postmortem blood degeneration
- X Seen 1-2 days after death
- X **May be seen as early as 12 hours**



# Deuel Halo's Sign

- x X-ray finding
- x Zone of reduced density visible around the head of a relatively mature fetus before delivery appears separate from the cranium

# FETAL CAUSES

- Multiple gestation
- IUGR
- Congenital anomalies
- Infections
- Hydrops (immune & non-immune)
- G6PD deficiency
- Birth Defects



# Mummification

- x Deficient blood supply & scanty liquor amnii.(no air entry)
- x Fetus dry & shriveled
- x Occurs after 2 weeks of IUD



# Putrefaction

- x Membrane are ruptured & dead fetus remains inside uterus
- x Signs of putrefaction appears-
  - marbling
  - Greenish discoloration
  - etc.



S.No	Features	Still Born	Dead Born
1.	Gestation Period	>28 weeks	Any
2.	Condition in uterus	Live-in –utero Died during the process of birth	Dead in utero
3.	Predominance	Mostly among illegitimate & immature male child & in primipara	No such predominance
4.	Cardinal Features	Signs of prolonged labor	Any one of the following(maceration/mummification/RM etc)
5.	Cause	Anoxia, aspiration, birth trauma, prematurity, strangulation, toxemia etc	Congenital anomaly, ABO & Rh incompatibility



# Live born!

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“According to Indian law “

Child will be regarded as born alive when **any part** of the living child has come out of mother's birth passage even though the child is not fully born

Proof of live birth  
(separate existence)

*“Breathing is Living”*

Onset of respiration is the beginning of (extra-uterine/independent) life.

-Barcroft



## Law Presumes



“Every Newborn child found dead was born dead until the contrary is proved ”



# Signs of live birth

## In Civil Cases

- x Cry of child,
- x feeling, seeing,
- x hearing of heart beat
- x slight muscular movements  
(twitching of eyelids,  
pulsating cord)



\*\*\*\* Exceptions



## Exception

Proof of breathing is not proof of life

### Vagitus Uterinus

Cry of the child when the head is still in the uterus

### Vagitus Vaginalis

Cry when the head is in the vagina

In immature fetus respirations are not strong enough to expand the air cells ,so child may live for some time(hours or 1-2 days)

## In Criminal Cases

Signs of live birth to be demonstrated by postmortem examination

# External Signs

1. Shape of chest & its measurement.
2. Changes in skin
3. Caput Succedaneum / Cephalhematoma
4. Changes in the umbilical cord

# Internal Signs

1. Position of highest point of diaphragm
2. Examination of Lungs----- Ploucquet's Test  
Hydrostatic Test
3. Findings in the stomach & Intestine----- Breslau's Second life Test
4. Meconium
5. Changes in Heart
6. Changes in blood vessel
7. Others

# External signs

## 1. Shape of chest & its measurements:

### Respiration established

Increase AP diameter & circumference (**Drum shaped**) .  
circumference greater than abdomen.  
intercostal spaces wider.

### Respiration not established

Flat, circumference less than that of abdomen, intercostal spaces narrow.

## Changes In Skin

Color: **Bright red** - At birth

**Brick Red** – 2<sup>nd</sup> to 3<sup>rd</sup>

**Yellowish** – 3<sup>rd</sup> to 6<sup>th</sup> day

**Normal** - 7<sup>th</sup> to 10<sup>th</sup> day

**X** Desquamation of skin:

Begins over abdomen by 2<sup>nd</sup> day

Completed by 3<sup>rd</sup> to 4<sup>th</sup> day

# Vernix caseosa

*“A white cheesy substance made of sebaceous secretions & epithelial cells*

”

- x Cannot be removed easily
- x Mainly present in the flexures of joints & neck folds
- x Persists for a day or 2



Caput succedaneum



Cephalhematoma



## Cephalhematoma

Soft ,fluctuant, localized swelling

Defined

Subperiosteal hemorrhage

After birth, size increases for 2-3 days

Do not cross suture line

## Caput succadaneum

Localized soft tissue edema

Ill defined

D/T decrease blood flow of the area

At birth  
Do not increase in size

Swelling crosses suture line

# Changes in the Umbilical cord\*\*

- 2 Hrs** : Cut margin dries
- 12-24Hrs** : Cord dries
- 36-48hrs** : Red ring (inflammatory) appears (around umbilicus)
- 2<sup>nd</sup>-3<sup>rd</sup> day** : Shrivels up
- 5-6<sup>th</sup> day** : Mummifies & falls off leaving a raw area
- 10-12 days** : Raw area heals & cicatrizes



# Internal examination

1. Position of highest point of Diaphragm :

Abdomen to be open before thorax.

No respiration---Diaphragm at level of 4<sup>th</sup> or 5<sup>th</sup> rib

Respiration Established- Level at 6<sup>th</sup> or 7<sup>th</sup> rib

## 2. Examination of lungs:

Features	Respired Lung	Unrespired Lung
Position	Fill the thoracic cavity, overlap heart with taut covering pleura.	Lying at behind of thoracic cavity behind the heart, covering pleura wrinkled and loose
Volume	Voluminous	Small
Edge/margin	Rounded	Sharp & clearly defined
Color	Mottled pink	Reddish brown or bluish
Appearance	Marbled	Smooth & not marbled
Consistency	Spongy, elastic & crepitant	Dense, firm liver like & non-crepitant

Features	Respired lung	Unrespired Lung
Microscopy	Alveoli Expanded, lined with flat squamous epithelial cell with prominent vascularity. Alveolar duct membrane may be present.	Alveolar sac closed, lined with cuboidal/columnar cells, less vascularity. Alveolar duct membrane absent.
Cut-section	Exudes frothy blood	Little blood & no froth
Weight-Body ratio	1/35 of body weight	1/70 of body weight
Extraneous material in the lungs	Present in distal respiratory passage(secondary bronchi and beyond)	Absent

## Foder's Test

X Weight of lung (before respiration)

30-40 gm

X Weight of lung (after respiration)

60-70 gm

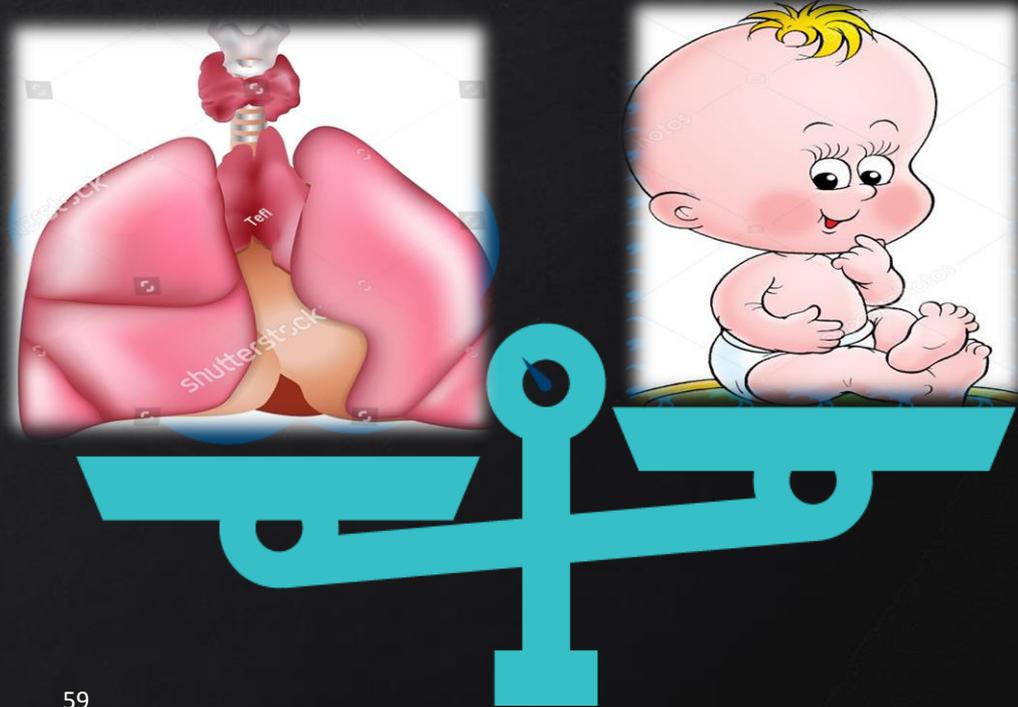
X d/t filling up of pulmonary blood vessel with the blood.

# Ploucquet Test

X Ratio of weight of lung  
& body

**1 / 70** before  
establishment of  
respiration

**1 / 35** after establishment  
of respiration



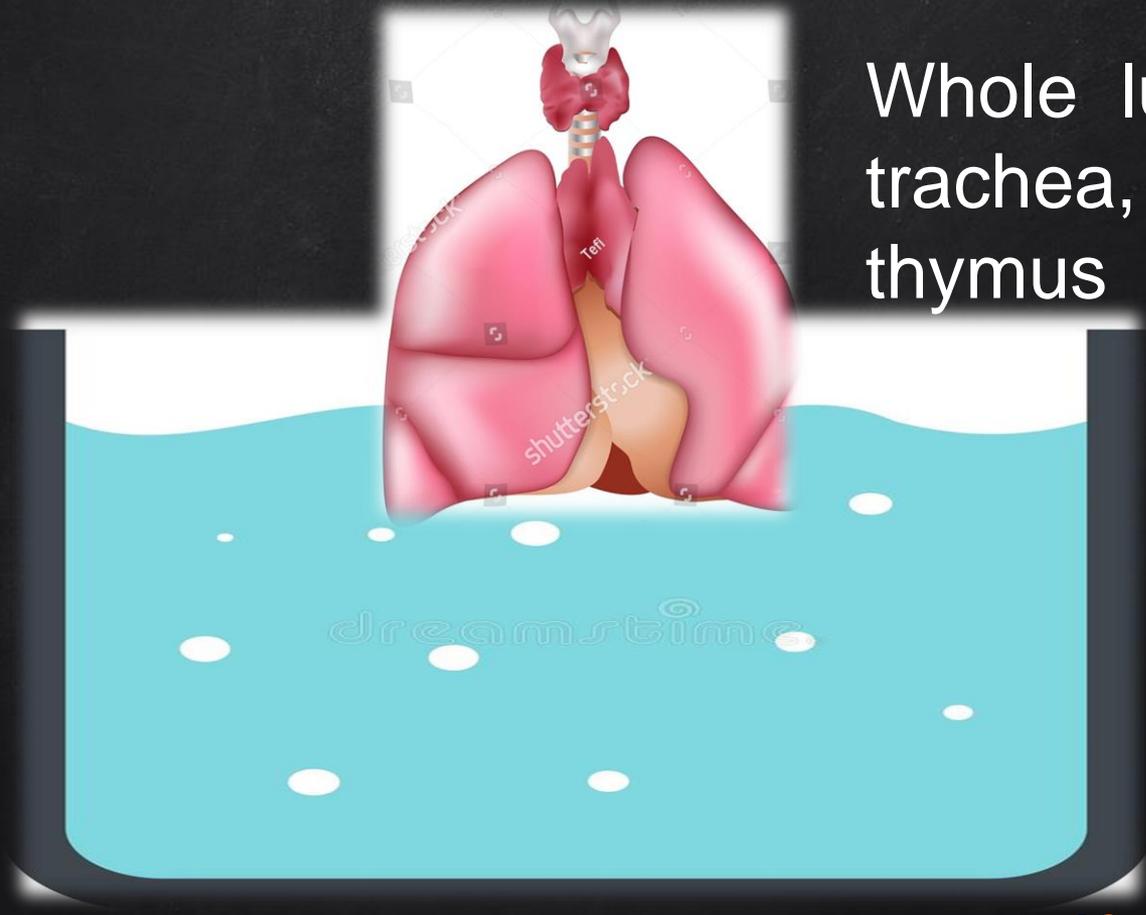
## Hydrostatic test / Raygat's Test

x By Schreyer in 1683

Principle:

Specific gravity of unrespired lung is 1.04-1.05

& that of respired lung is 0.94, **so unrespired lung sinks in water and those respired floats**



Whole lungs with trachea, heart & thymus

If they float

Put each lung in a separate container



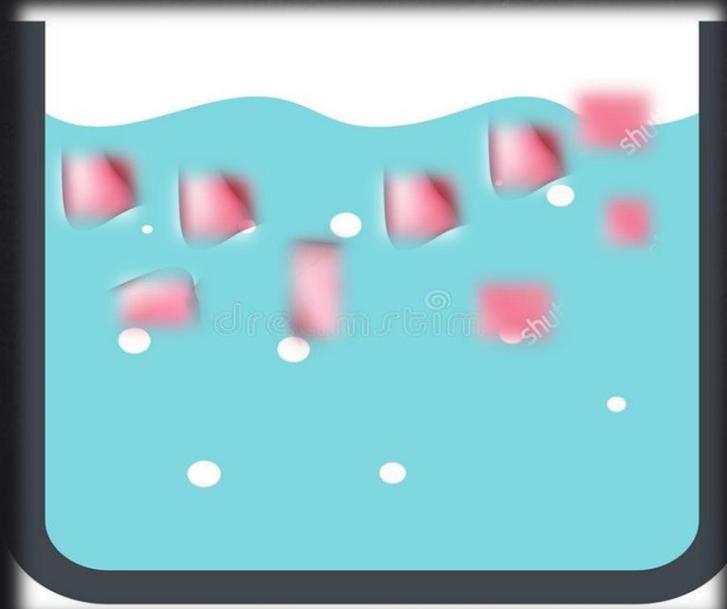
Right lung



Left lung

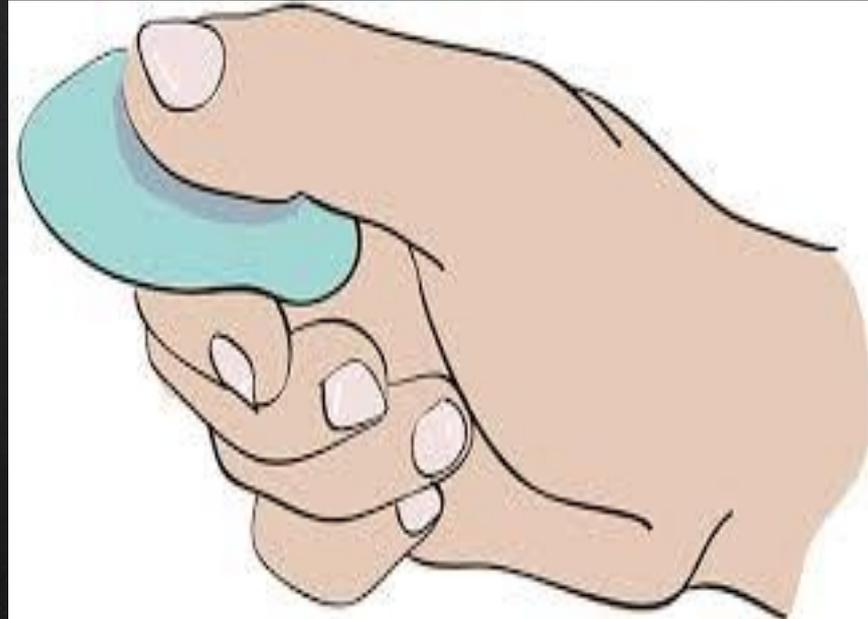
**If they float**

Cut each lung into small pieces  
(15-20 pieces) &  
separately put in water



If they float

Squeeze the lung pieces between thumb and index finger under water to see if air escapes.



If they float

Wrap the pieces in a cloth and place a weight over it , without crushing it

On applying weight tidal air escapes but not the residual air.



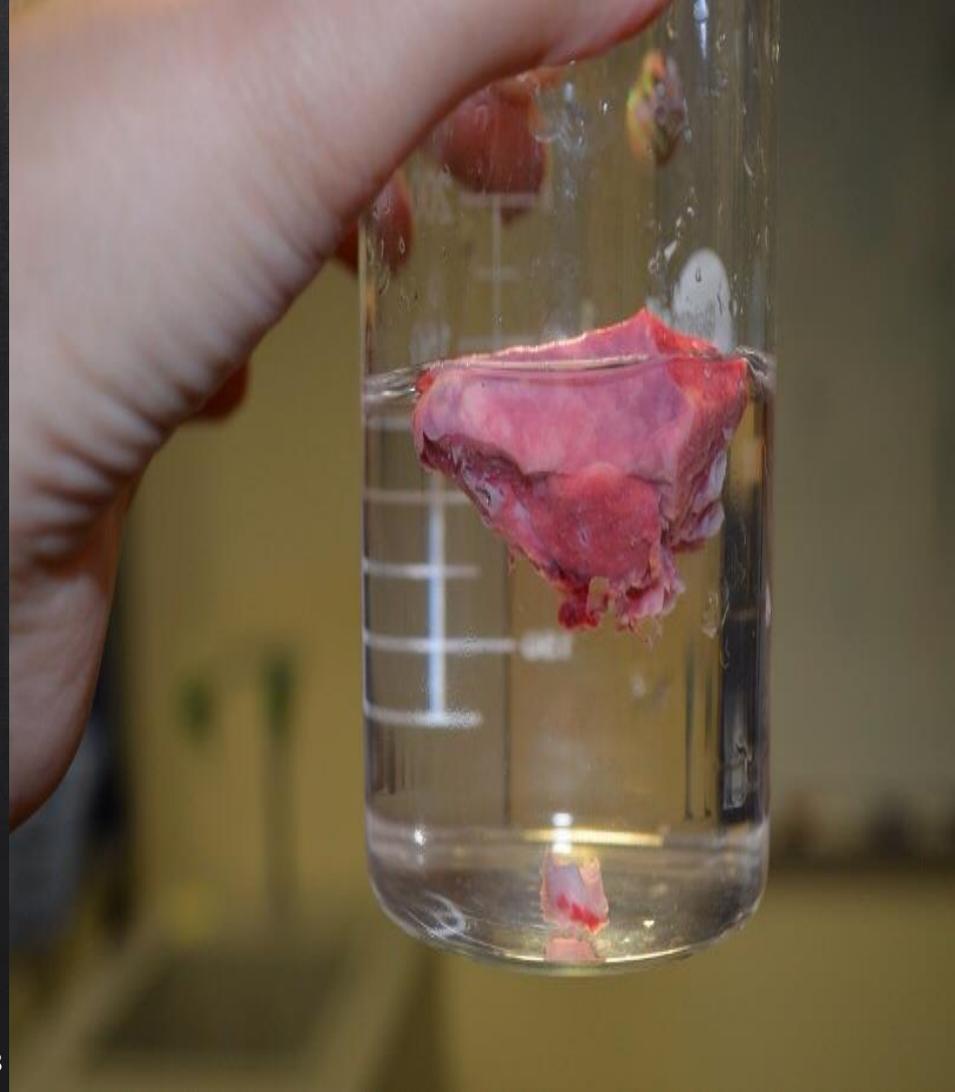
# conclusion

1. If all lung pieces float after applying pressure----**respiration had been established**
2. Some of the pieces float-partial inflation of lung ,baby lived for short period of birth.& **partially respired**
3. Whole lung & cut pieces sink , **respiration had not been established.**

A



B



# Fallacies of hydrostatic test



## Respired Lung may sink (False Negative)

1. Acute pulmonary edema
2. Bronchopneumonia
3. Atelectasis
4. Alveolar duct membrane
5. Very feeble respiration

## Unrespired Lung may float (False Positive)

1. Presence of decomposition gases
2. Artificial respiration
3. Mouth to mouth insufflation

## Hydrostatic test has no relevance

1. Child not viable
2. Shows signs of maceration
3. Decomposed fetus
4. Milk in stomach
5. Umbilical cicatrization
6. Monster fetus

## Other tests for separate existence

### 1. Breslau's 2<sup>nd</sup> life test:

Air in stomach & intestine (by double ligatures)

False Positive:

Resuscitation

Putrefaction

Survival period:

Within 15 mins-----Air in stomach

1-2 hrs-----air in intestine

5-6 hrs-----In Colon

12 hrs-----in Rectum

# Changes in the Middle air

## Wredin's Test:

Gelatinous substance in middle ear replaced by air through Eustachian tube

# Circulation

Umbilical Artery closes---3<sup>rd</sup> day

Umbilical Vein closes----4<sup>th</sup> day

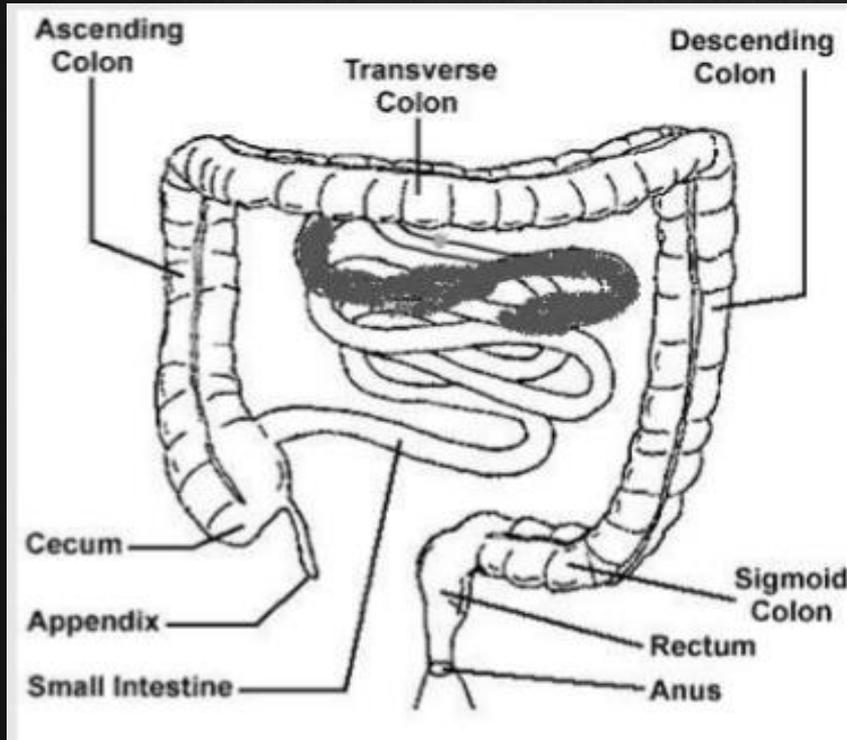
Ductus arteriosus-----10<sup>th</sup> day

Foramen Ovale—2-3 months

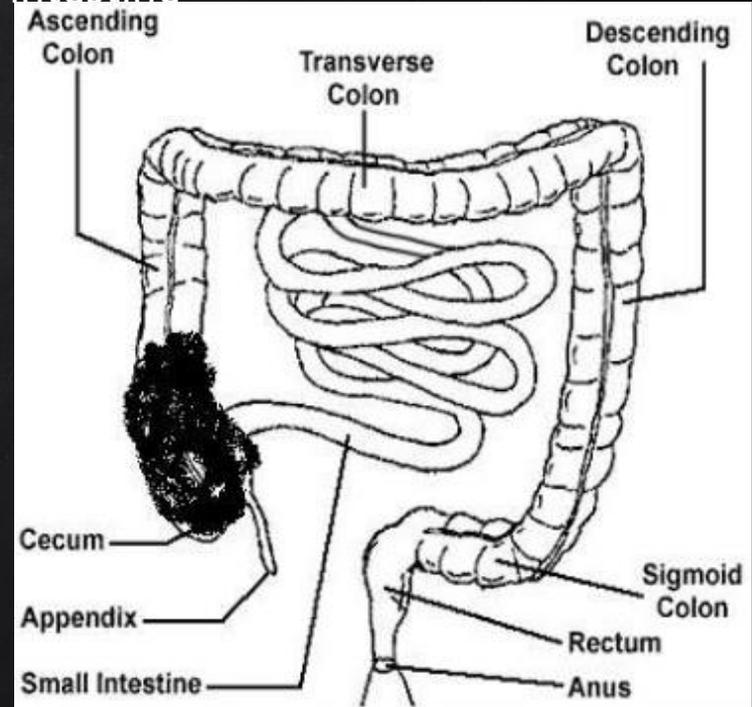
- x Presence of milk/honey/meconium/blood in stomach
- x Large intestine is completely free of meconium within 24hrs after birth

# Meconium

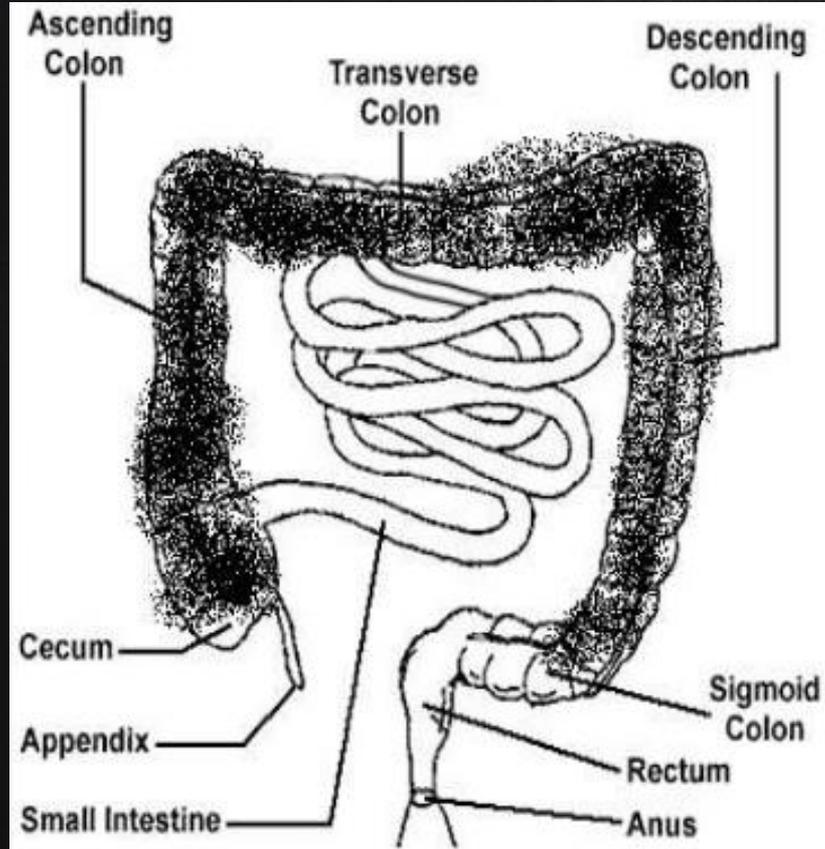
4<sup>th</sup> month –upper small intestine.



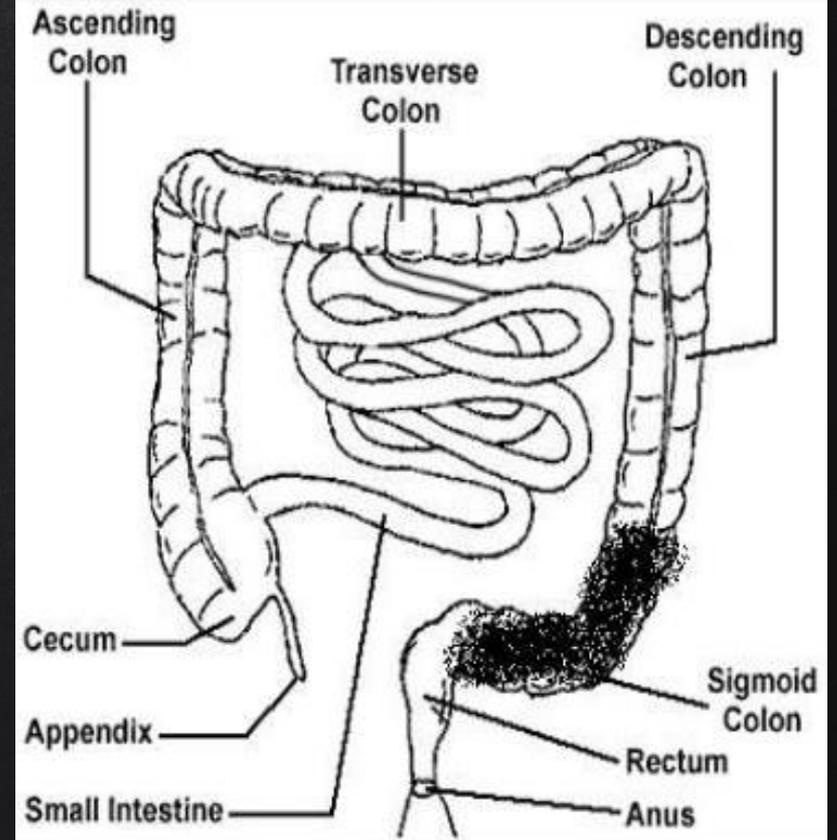
5<sup>th</sup> month-Beginning of large intestine



7<sup>th</sup> month-Entire large intestine



9<sup>th</sup> month-End of large intestine



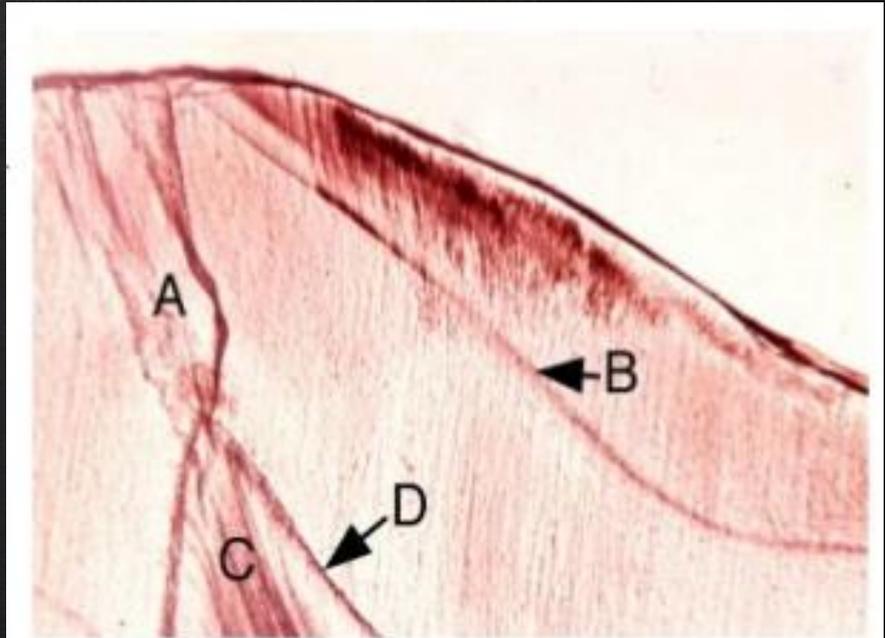
Darkest **Strias of Retzius**-occurs at time of birth, due to stress of birth.

Seen only in deciduous teeth & first permanent molars

Separates perinatal enamel from postnatal enamel.

Quality of perinatal enamel is better than postnatal enamel.

*“Incremental lines in the enamel of teeth – one of surest sign of live birth”*



Legend: **A**, Gnarled enamel; **B**, Neonatal line; **C**, Dentin; **D**, DEJ

- x Presence of some ossification center's
- x Nucleated RBC,s disappear within 24hrs
- x Fetal hemoglobin 55% to 60 % at birth
- x Closure of fontanelles

# Cause of infant Death

A. Natural

B. Unnatural: Accidental  
Criminal

## Natural causes

1. Immaturity
2. Congenital diseases( syphilis, small pox, rubella etc)
3. Post maturity
4. Placenta praevia
5. Pre-eclamptic Toxemia
6. Abruptioplacenta
7. Fetal asphyxia
8. Erythroblastosis

## Unnatural Causes (Accidental )

- X **Prolapse** of cord
- X Knots of cord
- X Twisting of cord around neck
- X **Prolonged** labour & severe moulding of head
- X Membranes covering face & accidental suffucation
- X Precipitate labour

# Prolapse of cord



# Cord around the neck





*“ When the combined duration of 1<sup>st</sup> and 2<sup>nd</sup> stage of labor is **less than 2 hours** which results in rapid expulsion of baby ”*

Fetus may be normal /premature  
In **multipara with large roomy pelvis**

Confuses with nature's call , & infant gets drowned in the lavatory pan.

Infant may aspirate mud, blood, meconium& foreign body

Umbilical cord 50cm long , so delivery in standing position baby will never touch ground.

Umbilicus strong enough to hold baby weight.

If breaks always at fetal end and not at placental end and never breaks from middle.

No caput succedaneum or moulding.

## Examination of mother:

Signs of recent delivery

Roomy pelvis

Old healed perineal scars

## Examination of the baby

Absence of moulding

Evidence of mud, gravel or sand

Baby seen with cord & placenta

Cord torn & never cleanly cut

Evidence of drowning (if delivery in lavatory pan)

Features	Head injury in precipitate labor	Head injury due to blunt trauma
Contusion	At presenting part	Anywhere on scalp
Laceration	Absent	May be present
Fracture	Fissured fracture (parietal)	Comminuted & depressed fracture
Brain	Usually not injured	Contusion, laceration & hemorrhage may be seen

# Criminal causes of infant death

## Acts of commission

1. Smothering
2. Strangulation\*
3. Gagging
4. Drowning
5. Head injury
6. Cut throat wound /stabs
7. Concealed punctured wound
8. Fractured dislocation of cervical vertebrae
9. Poisoning
10. Live burial

## Acts of omission

1. Failure to remove membranes from face
2. Failure to ligate the cut end of umbilical cord
3. Failure to protect from heat & cold
4. Failure to feed the baby

## Concealment of birth (Sec.318 IPC)

Whoever, secretly buries or otherwise dispose the dead body of a child, whether such child dies before or after or during its birth, intentionally conceals birth of such a child , shall be punished with imprisonment up to 2 years



## Abandoning of a child(Sec.317 IPC)

Father / Mother of a child who is under 12 years ,or anyone who is having care of such child, leaves such child in any place with the intention of abandoning the child ,shall be punished with imprisonment up to 7 years



# Battered baby syndrome

- X Caffey 's syndrome
- X Maltreatment syndrome
- X Child abuse syndrome



“Child is getting repeated physical injuries due to non accidental violence from parents /guardian”

1<sup>st</sup> noted by Ambroise  
Auguste Tardieu in 1860.



John Caffey (pediatric radiologist)  
in 1946



# Classical feature of battered baby syndrome

## 4 D's

**D**iscrepancies of injuries & history provided

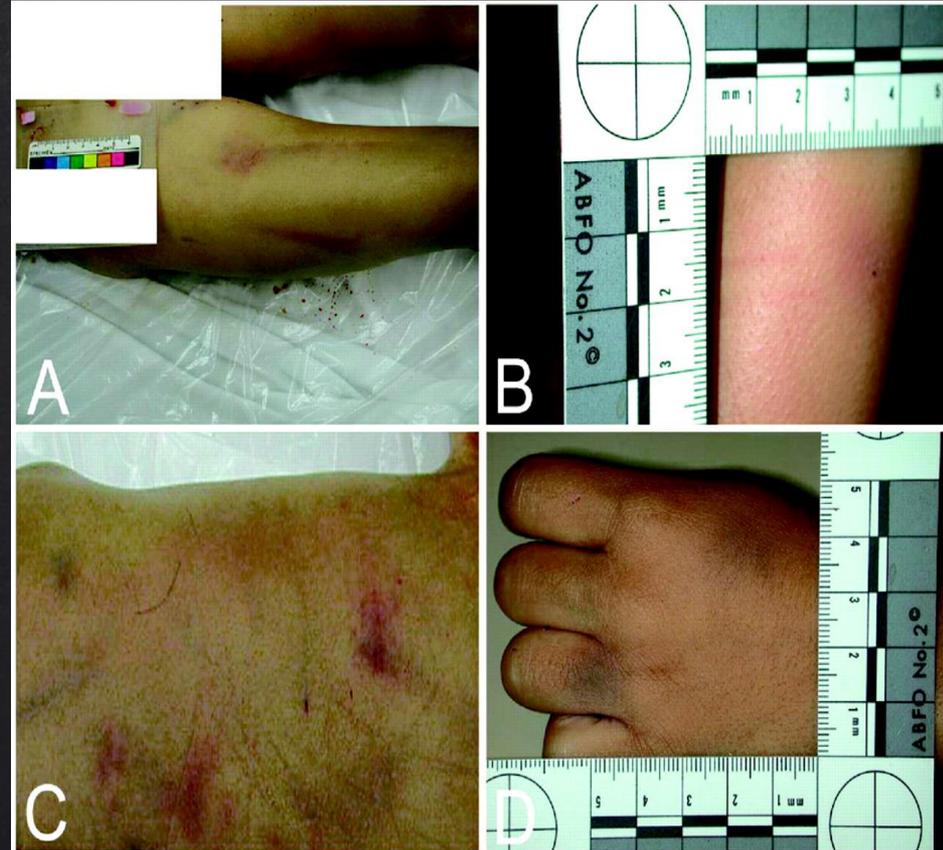
**D**elay between injury & medical attention

**D**ifferent dates- repetition of injuries

**D**eprivation of nutrition ,care & affection.

- x Usually <3years
- x Lower socioeconomic status
- x Unwanted child

- X Multiple bruises of different age
- X Abraded contusions
- X Pinch marks as butterfly shaped bruises
- X Lacerations in inner aspects of lips & frenulum tear
- X Bald patches on hair
- X Cigarette butts burn marks
- X Bite marks
- X Subconjunctival hemorrhage, retinal separation, lens displacement, black eye



- X Subdural hemorrhage D/t violent shaking of head
- X Visceral injuries
- X Blunt trauma to chest, rib fractures, hemothorax, diaphragm ruptured etc.
- X Skeletal injuries: periosteal separation, fracture with callus of different age
- X 'string of beads'
- X Nobbing fractures (rib fractures on posterior aspect close to spine)



# Differential diagnosis

- X Scurvy
- X Rickets
- X Juvenile osteoporosis
- X Congenital syphilis
- X Osteogenesis imperfecta etc.

# Shaken baby syndrome (Infantile whiplash syndrome)



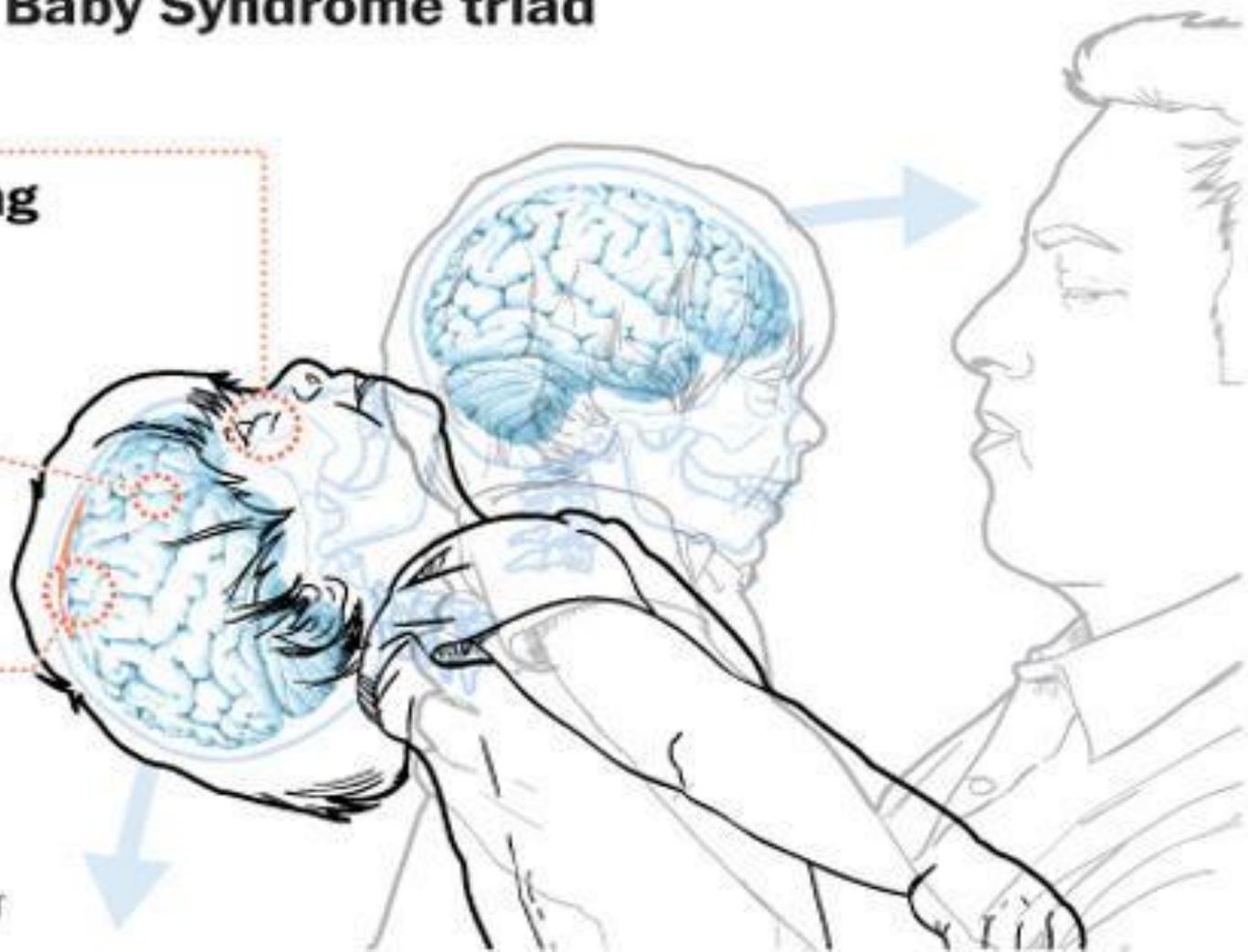
SBS is a brain injury caused by excessive shaking.

# The Shaken Baby Syndrome triad

**Retinal hemorrhaging**

**Brain swelling**

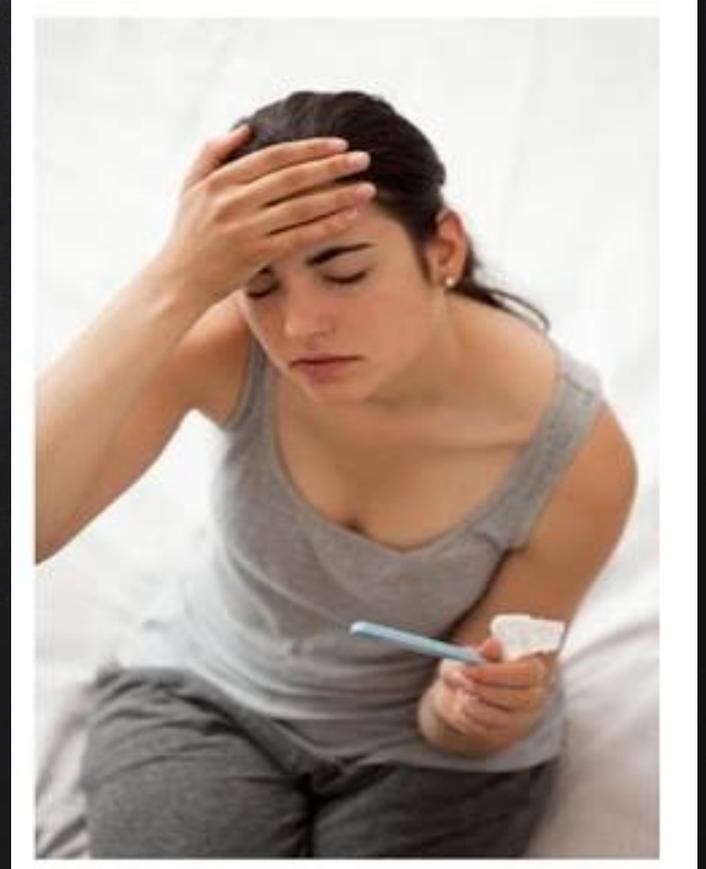
**Subdural hematoma**



ALBERTO CUADRA/  
THE WASHINGTON POST

# Munchausen's Syndrome

Feigning illness or injury & going from hospital to hospital for unnecessary investigation and treatment



# Munchausen's Syndrome by Proxy

Action of one person (usually mother) who inflicts harm against another person (usually an infant or small child) in an attempt to gain sympathy & attention for both of her own & child's suffering



# Sudden infant death syndrome(SIDS) (Cot / Crib Death)

- X Sudden death of an apparently healthy infant under 1year of age.
- X **Remains unexplained** after a thorough **forensic autopsy and detailed death scene investigation**
- X **Incidence=0.2-0.4%**



1. **Age group** – 2-6 months
2. **Premature** birth
3. High preponderance in winter season
4. **Sex** - M:F=3:2
5. **Social status** - lower and middle class
6. Bottle fed babies more prone
7. Smoking & alcoholism during pregnancy
8. **Time of death** - death possibly occurring at **late night** or after sometimes of **1<sup>st</sup> feeding** of the infant in the **morning**

## Precipitating causes

1. Prolonged sleep apnoea - presently accepted as the most countable of the suggested cause
2. Local hypersensitivity of respiratory tract
3. Viral infection
4. Bed clothes and pillow falling accidentally over mouth
5. Prone position
6. Overlying

# Autopsy

- X Blood stained froth at nostrils
- X Petechial hemorrhages on surface of heart, lungs & thymus
- X Evidence of laryngitis, tracheitis, bronchitis, pleuritis
- X No specific features

## Precautions to prevent SIDS

- X Proper ventilation
- X Dust free atmosphere & optimum temp.
- X Don't place child on prone position
- X Avoid soft bedding
- X Avoid bed sharing with mother during sleep

## Medicolegal importance

- Cot death being **natural** or very occasionally **accidental**, the parent may be wrongfully linked for having criminal involvement or negligence
- Some criminal infant death cases may be presented as natural cot death cases



thanks!

Any questions?

You can find me at  
[dr.sangeeta.sahni@gmail.com](mailto:dr.sangeeta.sahni@gmail.com)