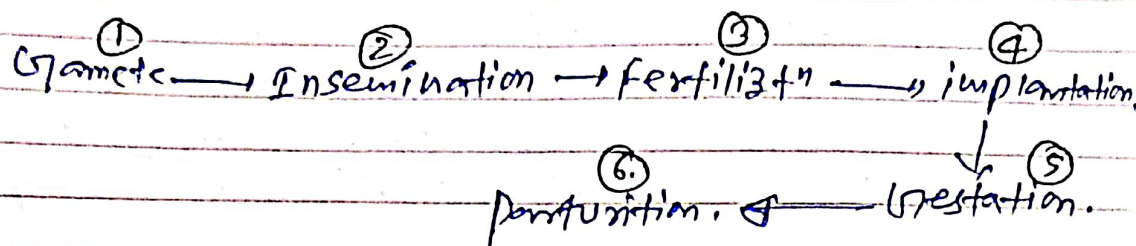


Date.
12/Nov/2019.

* At Birth it is $\rightarrow$ sec. sexual organ.
* At puberty it is $\rightarrow$ " sexual character.

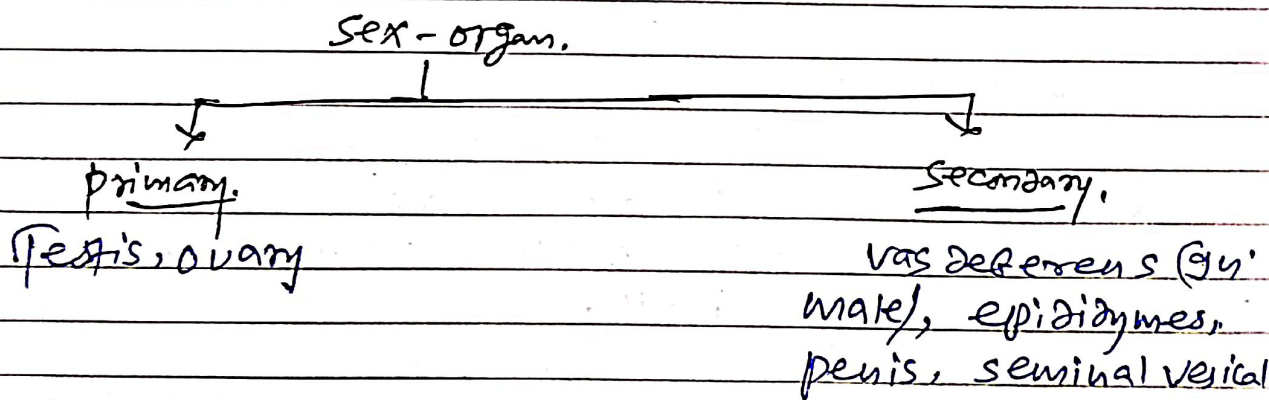
Human-reproduction.

* (1) Sequence of events $\rightarrow$



* Attachment of Embryo to uterine wall =
implantation.

* Transfer of male gamete into female
genital tract = insemination.



In female: $\rightarrow$ uterus, fallopian tube, vagina

* Breast is a sec. sexual character. not
sec. sexual - organ.

Male reproductive system:-

- * testis develop in the abdominal cavity but descending to scrotum before birth, b/c spermatogenesis occur at low temp. and the temp of scrotum is $2-2.5^{\circ}\text{C}$ less than abdominal cavity temp.

Term:-

Cryptorchidism:- Condition in which testis do not descending to scrotum, after Birth.

Orchiectomy:- Surgical removal of testis from abdominal cavity.

Castration:-

- * Uteronaculum (mesorchium):- Elastic fibres which connect testis to scrotum wall.

- * Dartos muscles:- These are smooth muscles +nt in scrotum wall for regulation of Temp of scrotum

- * Cremaster's muscle:- It is for elevation of testis.

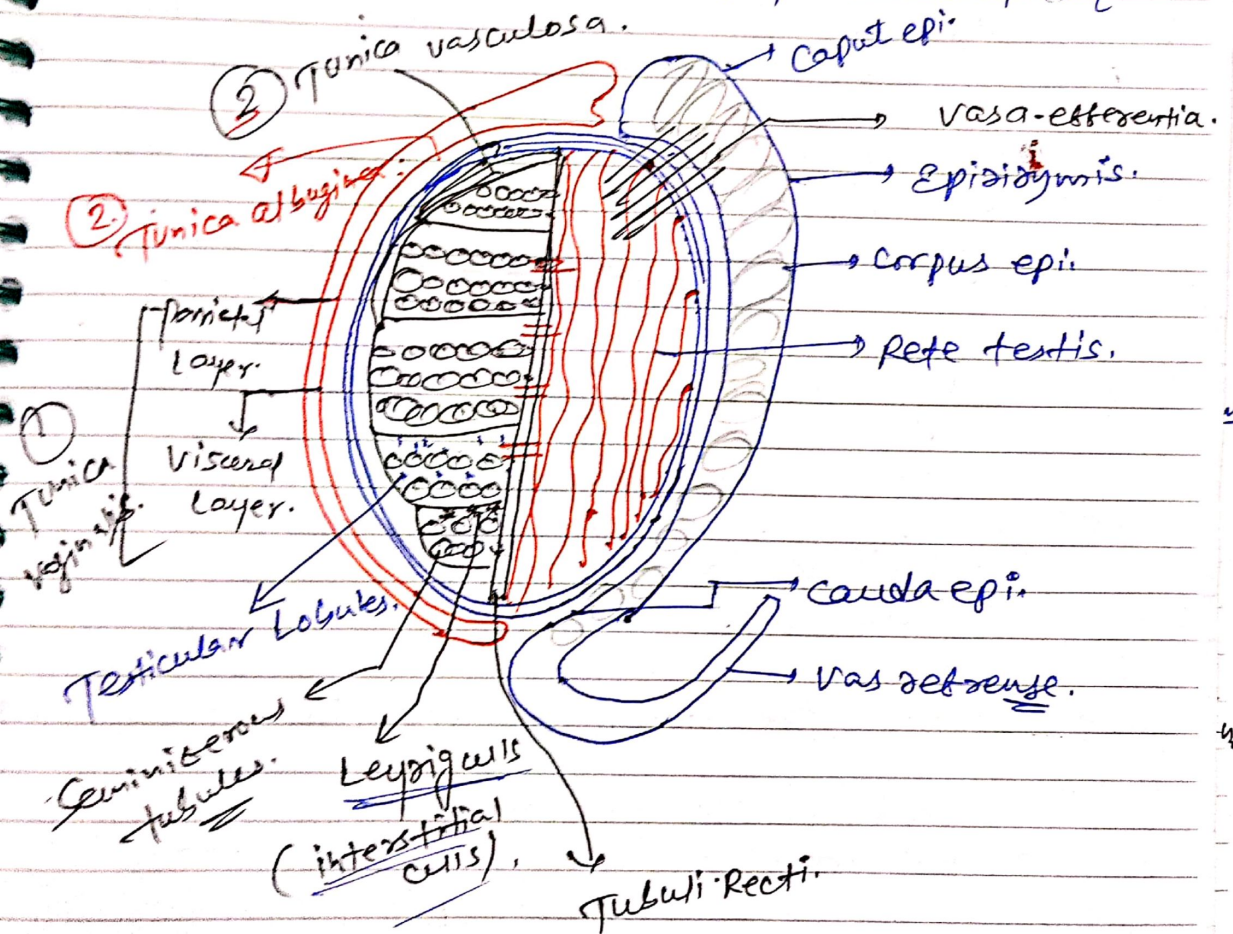
- * Inguinal canal:- passage which connect abdominal cavity to scrotum cavity.

* Spermatozoa life span (in male)
↳ few hour to few months.
(up to 64 days).
* (in female) - 72 hrs (3 days)

* Spermatic chord :- This tube connects testis
into abdominal cavity. Blood vessels,
nerves, vas deferens passes through it.

* intra abdominal testis :-

Found in whale, dolphin, Elephant



Testis → Mesodermal, oval shape, weight 10-15 gm, Length (4-5 cm), width (2-3 cm).

~~There~~ each testis has 250 compartments. Called Testicular Lobules. Each lobule has 1-3 highly coiled seminiferous tubule. These are structural and functional unit of testis. They produce sperm.

- * Leydig cells/interstitial cells +nt in interstitial space. They synthesise and secrete male sex hormone. (androgen/testosterone)

- * Other immunological competent cells also +nt in interstitial space.

- * Vasa efferentia connects rete-testis to epididymis. It is lined by ciliated epithelium.

- * Sperms are stored in epididymis.

- * Functional maturation of sperm occurs in epididymis.

- * Epididymis and vas-deferens have stereociliated epithelium.

- * Male accessory ducts :-
 - ① Rete-testis.
 - ② Vas-efferentia.
 - ③ Epididymis.
 - ④ Vas-deferens.

(अंतर्ग)

* Intra testicular genital duct syst =
Tubuli recti + rete testis + vasa efferentia

* In epididymis decapitation occurs.
In this cholesterol layer and
inhibitory protein deposit on sperm.

* Male Urethra carry Both Semen and
Urine.

⊛ Male-accessory glands : →

* ① Seminal vesicle : → pair, tubular gland
, gt's alkaline secretion.
Form 60-70% part of semen.
In gt's secret fructose sugar + prostaglandins
+ citrate + fibrinogen + ut.

⊛ Sperm use fructose as a energy
fuel.

⊛ Citrate act as a calcium binder.

⊛ prostaglandins generates contractile wave
in female genital tract, after ejaculatn

⊛ ② Prostate gland : →

Single, large, Ball like.

It secret form 30-40% part of semen.
In gt's secret Ca, ptt and clotting
enzyme + fibrinolysin + ut.

* Clotting enzyme of prostate + fibrinogen of
seminal vesicle help in the coagulation
of semen.

fertilizing affected.
 prostate remove
 sperm (solid at 20°C)
 Capacitation not take place.

- * Fibrinolysin Convert coagulated semen into normal form. so prostate gland is for motility of sperm.

(3) Cowper gland / Bulbourethral gland :-

It's alkaline secretⁿ neutralise the acidity of male urethra.

This gland also help in the lubrication of penis.

* It is an Ant of seminal Plasma.

- * Secretⁿ of these accessory gland is called seminal Plasma.

- * Seminal Plasma rich in fructose, Ca^{+2} , and certain enzymes.

- * Semen = Seminal Plasma + Sperm.

↓
alkaline.

pH = 7.7

- * In single ejaculatⁿ 3 to 4 ml semen released, which contain 200-300 million Sperms.

- * For normal fertility 60% should be normal shape and size and in them 40% must be motile.

① Spermiogenesis → ② spermiation → ③ Semination.

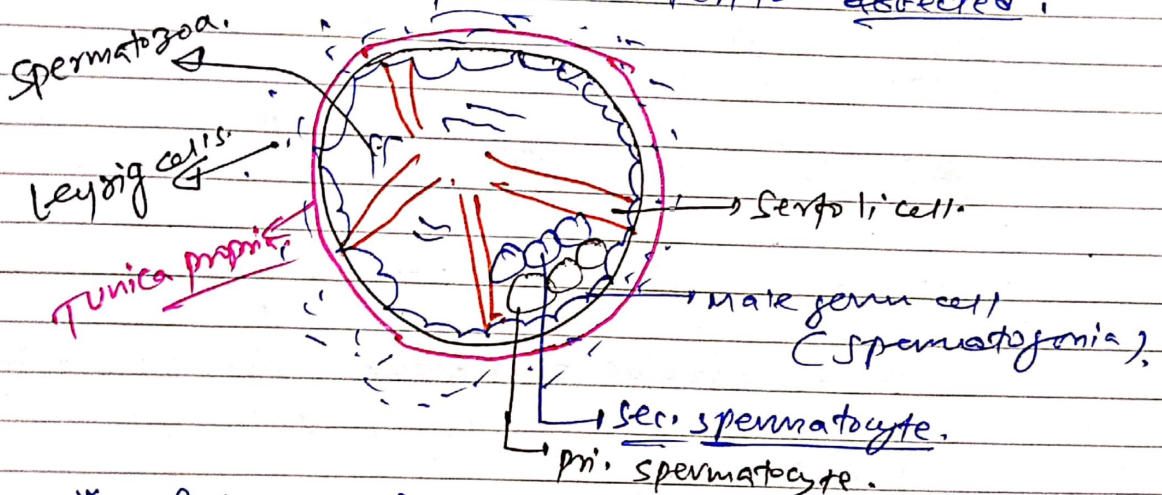
Insemination. ← Ejaculation. ④

⑤ 1 ml Semen contain 50-150 million sperm.

If sperm count is less than 20 million per ml = oligospermia.

* No sperm in semen = Azospemia

* To cut vas-deferens (Vasectomy) causes semen without sperm so, fert^l affected.

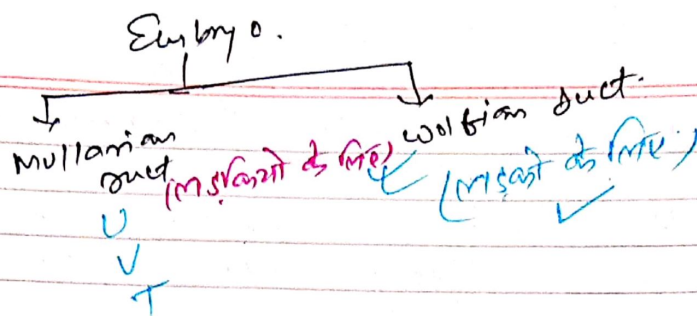


* Release of sperm from Sertoli cell/seminiferous tube.
= spermiation.

* Release of sperm from testis = semination.

* " " " " Male-body = ejaculation.

* Transfer of sperm into female genital tract = insemination.



* Outer covering of seminiferous tubule = Tunica propria.

* germinal epith. have 2 types of cell.

① male germ cell (spermatogonia)
= they produce sperm by spermatogenesis.

② Sertoli cell / Nurse cell → Long pyramidal

Shape, provide nutrition for developing sperm. It is found only in mammalian testis.

Function of Sertoli cells. regulated by FSH.

* Sertoli cells secrete some factors which help in spermiogenesis.

* Sertoli cell secrete inhibin hormone which suppress FSH secretion.

* These cell secrete ABP (Androgen Binding protein) for the

concn of Testosterone

⑧ ANS
↓
erectn of penis.

Micturition.
↓
(parasympathetic).

* Sertoli cell form Blood testis Barrier.
(tight junction)

* S.C. Secrete AMH ^{→ Antimüllerian hormone} which Stop müllerian duct growth.

✓ *** Function of male accessory duct and accessory glands regulated by androgen / Testosterone.

Penis.

It is external genitalia + copulatory structure of male.

* Interior extended part of penis = glans penis
It is covered by loose skin fold, called foreskin / prepuce.

* Penis has 3 longitudinal cords.
2 corpora cavernosa (BTR)
+ 1 corpus spongiosum (Atr)

* Parasympathetic system is for erectn of penis.
* Sympathetic " " " ejaculatn of semen.

✓ During erectn. penis muscle relax +
Blood sinus filled with blood. +
arterial dilated + venous supply block

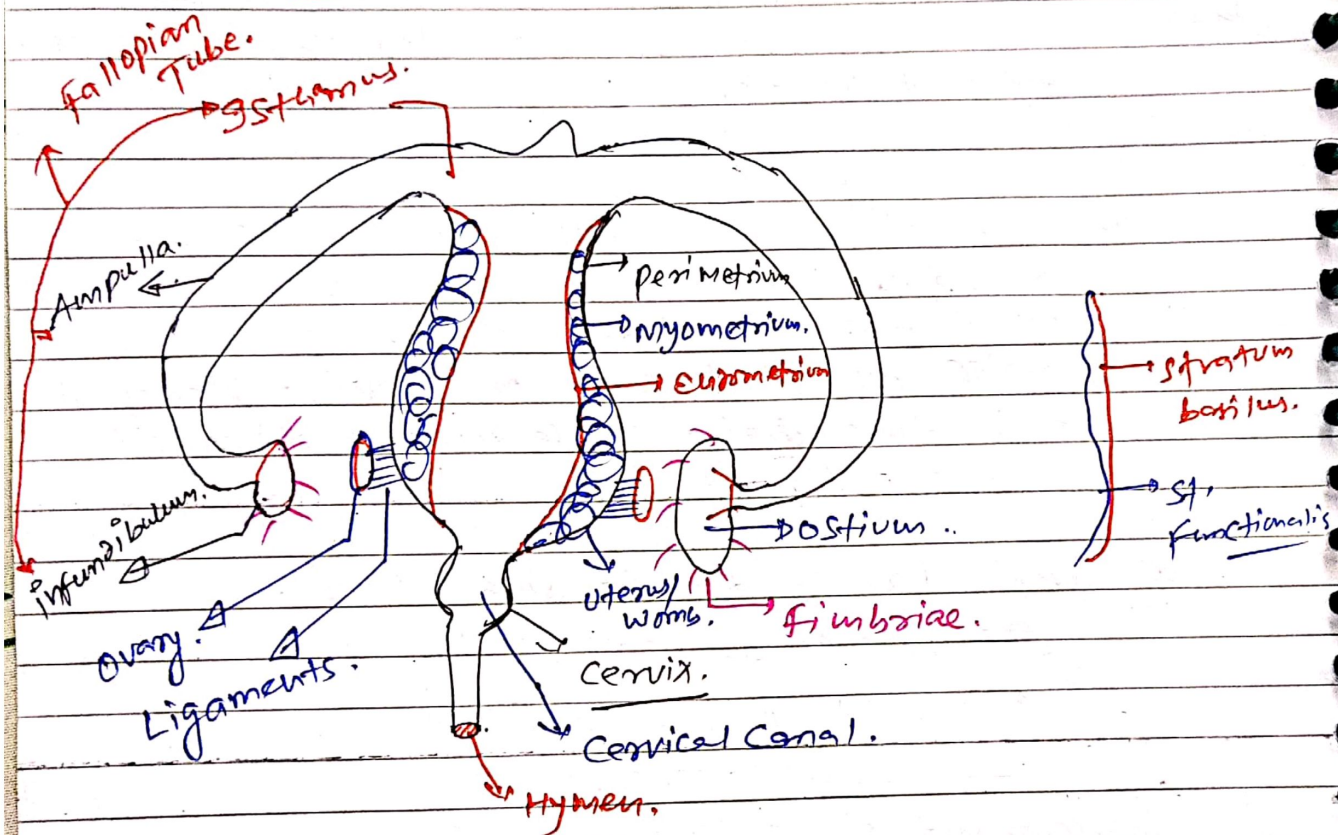
* In normal congn → penis muscle contract

erectⁿ → parasympathetic

* ✓ Functions of Leydig cells regulated by LH.

* Testosterone stimulates spermatogenesis + secondary sexual character in male.

Female reproductive system:-



→ Ovary is connected to uterus and dorsal body wall by ligaments.

→ Female accessory duct = fallopian tube + Uterus + Vagina.

- * fallopian tube have ciliated ~~ep~~ cells and secretory cells.
- * Parts of fallopian tube closer to ovary = infundibulum.
- * fimbriae are long finger like projects which help in collectn of ova.
- * Widest and longest part of fallopian tube is ampulla. It is site of fertilisation.
- * Isthmus part join with uterine cavity.
- * Uterus / womb are ^{size,} invert, pear shape muscular shape bag like structure.
- * It has 3 part (fundus, body, cervix).
- * Uterus open into vagina through cervix. It's cavity is called cervical canal.
- ⊗ Vagina + cervical canal = Birth canal.
- ⊗ Wall of uterus has 3 layers.
 - (i) perimetrium.
 - (ii) myometrium = middle, smooth muscle layer.
 - (iii) endometrium = inner, glandular layer.
- * cyclic changes occur in endometrium during menstruation and myometrium shows stronger contraction during child birth.

* Endometrium has 2 layer.

- ① Stratum Basalis
- ② " functionalis.

(*) Vagina is non-glandular, acidic pH,
non-keratinised stratified squamous epith.

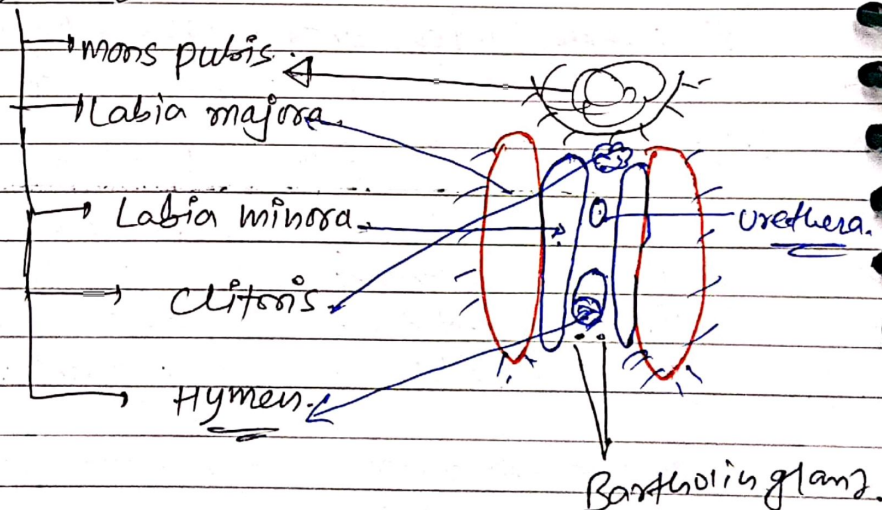
(*) Opening of vagina is partially covered
by thin membrane ^{called} Hymen.

* Presence or absence of Hymen membrane is
not indicator of virginity.

* Surgical removal of uterus = Hysterectomy.

External genitalia of female / vulva.

It consist of



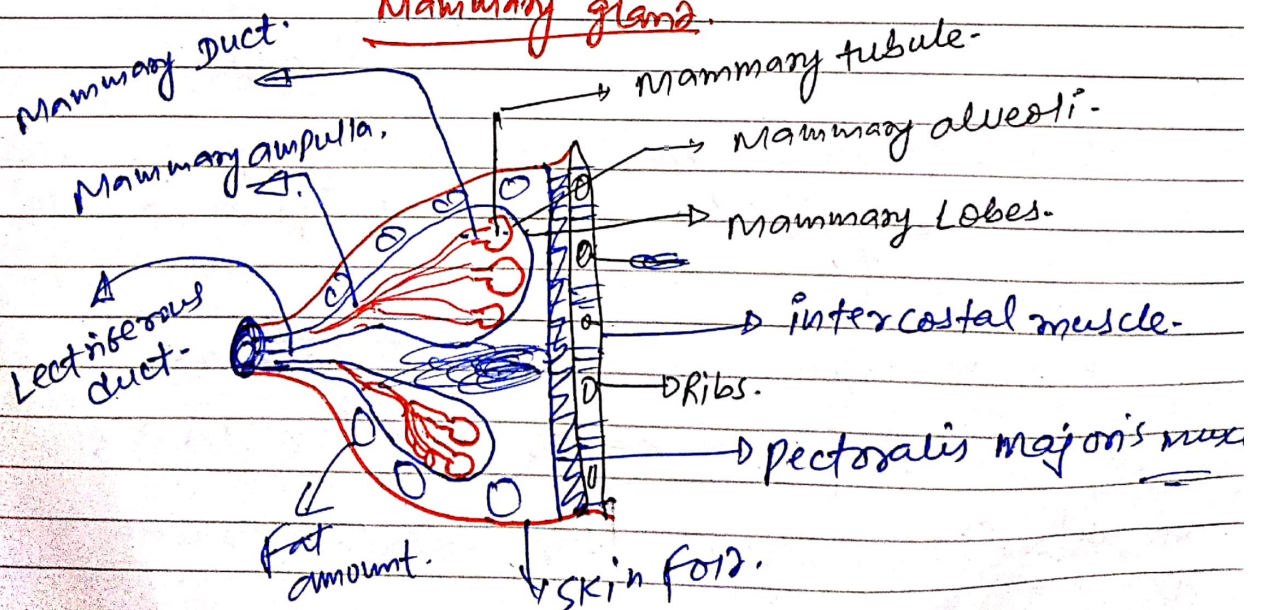
* Mons pubis →

* Labia minora → are pairs, inner smaller skin fold.

* Clitoris → is tiny and like structure, homologous to penis. It is present above urethral opening at upper junction of labia minora.

* In female 1 pair Accessory gland (not) called Bartholin's gland / greater vestibular gland which secrete alkaline fluid, which neutralise acidity of vagina. So it is similar to Cowper's gland of male.

Mammary glands.



→ mammary gland is comp^o alveolar tubular gland.

→ It is modification of sweat gland.

✓ Each Breast has glandular tissue and adipose tissue.

→ each breast has 15-20 mammary lobes which are separated by adipose tissue.

→ each lobe contain cluster of mammary alveoli which is lined by milk producing cell. milk is stored in lumen of alveoli.

* Mammary alveoli → mammary tubule → mammary duct

↓
ampulla.

↓
lactiferous duct

↓
nipple.

* Nipple is a multiporous skin fold. around nipple circular pigmented region areola present.

* on mammary glands & hormones

for development of Breast →

- ① progesterone = for alveolar growth.
- ② estrogen = for tubular growth.

* Crestation of prolactin (at pregnancy
and milk
ejection)
* After parturition
↳ Oxytocin is responsible.

(3) Prolactin → for milk synthesis.

(4) Oxytocin = for milk ejection.

(*) Gametogenesis. (formation of gamete)

↓
Spermatogenesis.

* formation of sperm.

* occur in seminiferous tubule.

* Start at puberty

↓
Oogenesis.

* formation of ova.

* in ovary.

* Start in embryo stage.

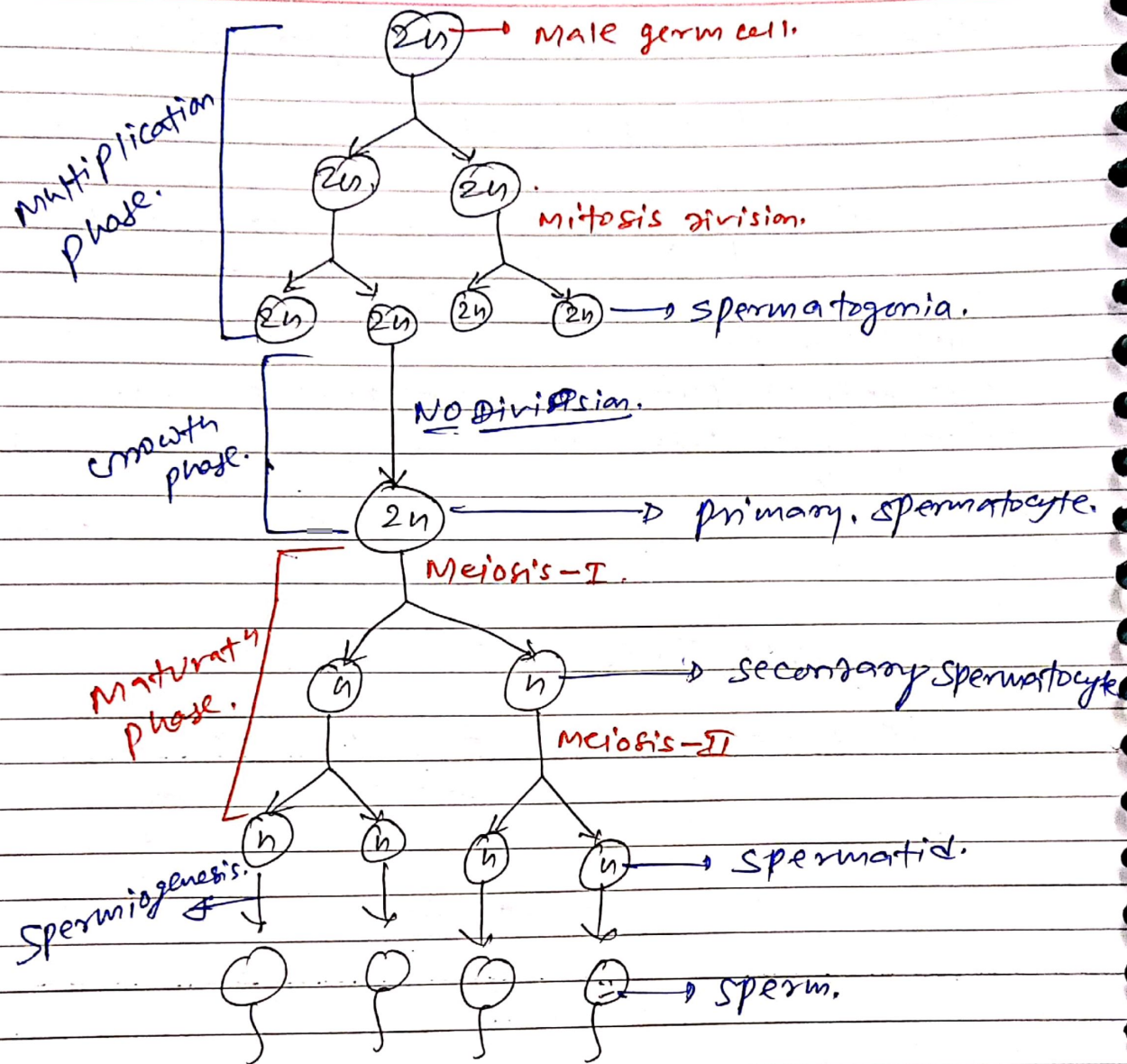
Spermatogenesis.

* Spermatogenesis → Spermiogenesis

↓
Spermiogenesis

↓

insemination → ejaculation.



Spermatogenesis = Spermatocytogenesis + Spermiogenesis.

* formation of spermatid from male germ cell = spermatocytogenesis.

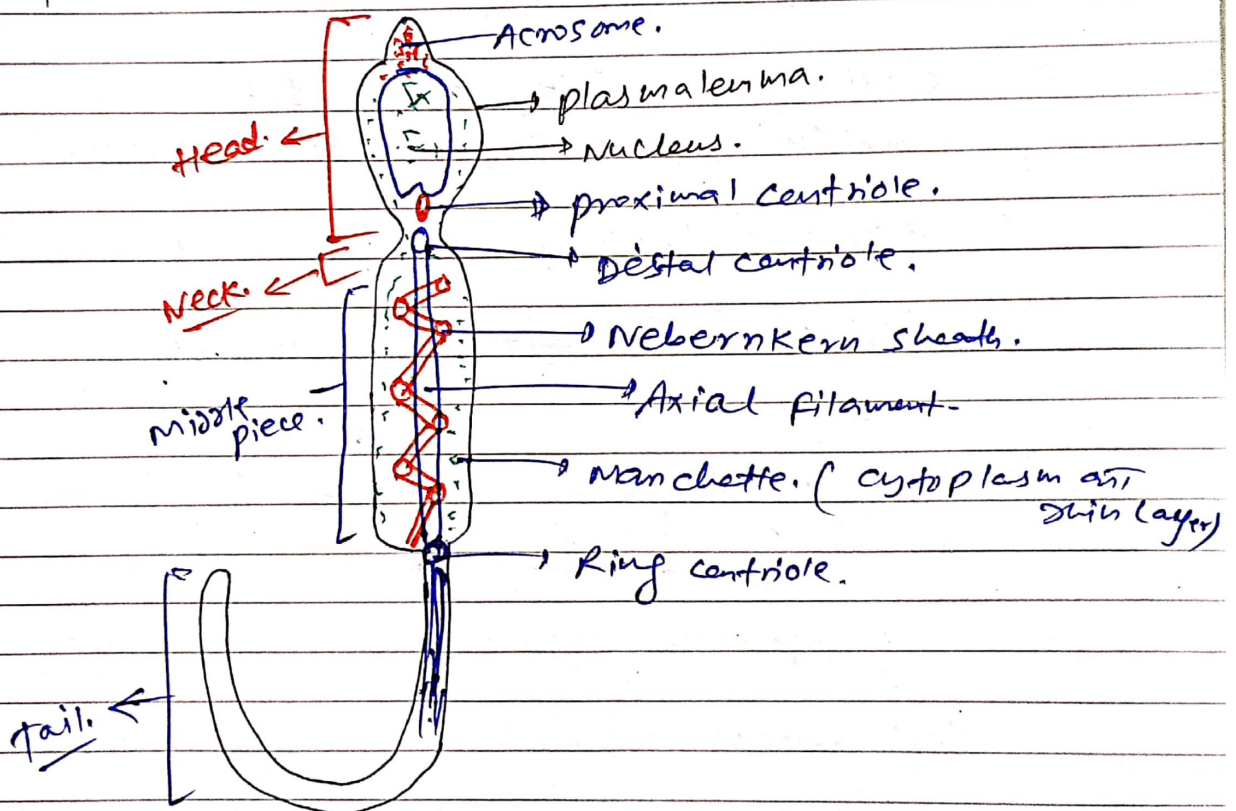
② Sperm & ER not
3:5 & centriole not

* Conversion of non-motile rounded spermatid into motile elongated sperm is called spermiogenesis.

* 1 primary spermatocyte produce 4 sperm.

* Spermiogenesis → spermiation → seminatio → ejaculatio
↓
insemination.

*



* Head of sperm = nucleus + acrosome

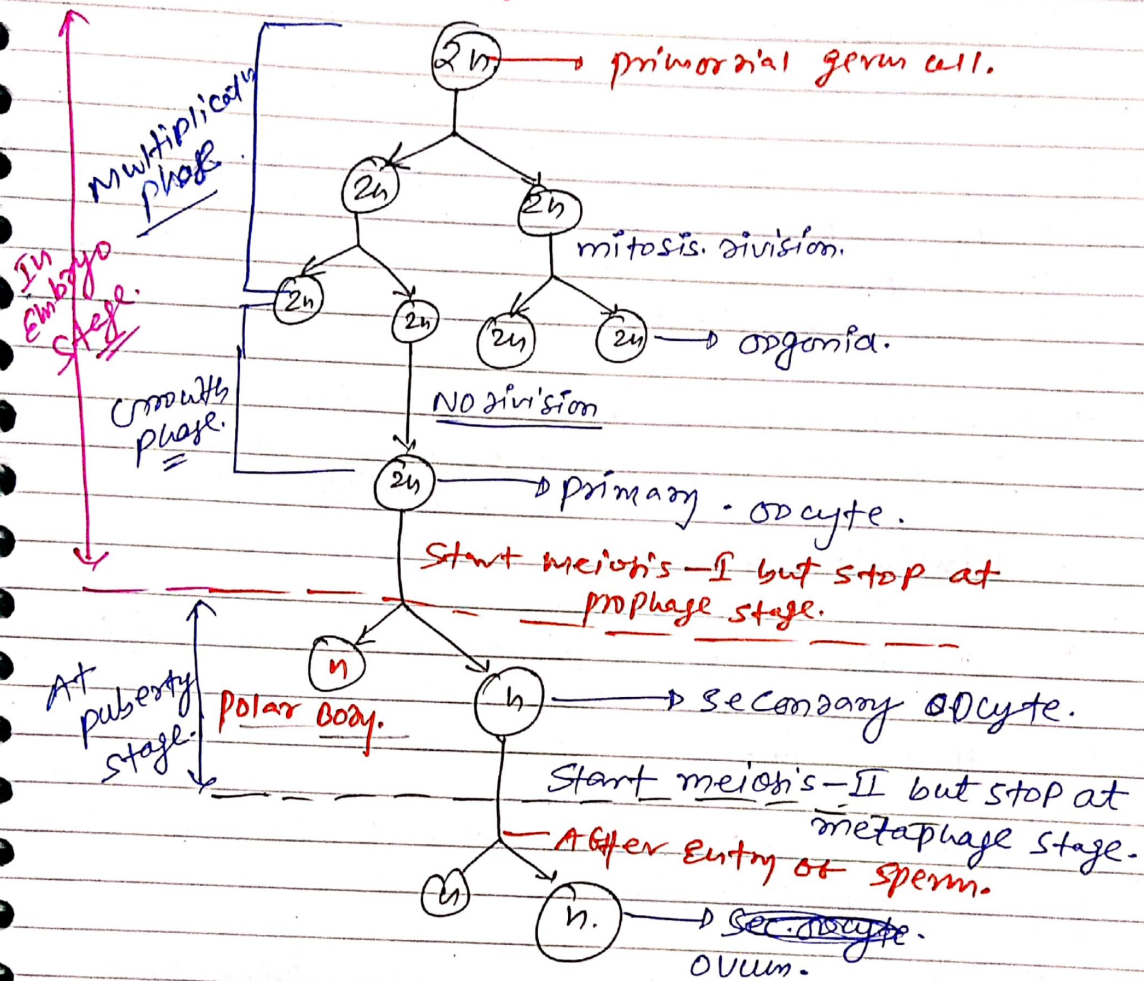
* Middle piece of sperm = mitochondria
+ Axial filament

⊗ Flagella man se kafi kam milta hai except
⇒ human Sperm.

- * Acrosome formed from golgi body during Spermiogenesis. It help in fertilization. It contain enzymes which dissolve egg memb.
- * Nucleus is elongated haploid.
- * Spiral layer of mitochondria is called Nebenkern sheath, which provide Energy for movement so middle piece is called power house of sperm.
- * proximal centriole start 1st cleavage division in a zygote after fertilization.
- * Distal centriole produce axial filament.
- * Thin layer of cytoplasm in sperm = Manchette.
- * Tail is longest part. It is for movement. It is flagellated.
- * Cell organelle absent in sperm = ER
- * Cell ~~absent~~ organel " " egg = centriole.

polar body gets
with chroms 23(n) & with fertilisation it can
Further

Oogenesis



* Oogenesis is ~~region~~ initiated in Embryo stage. due to this a couple of million oogonia are produced in each fetal ovary.
~~NO more ova~~

NO more oogonia are produced and added after Birth.

- * Some oögonia become a large by storing of nutrients and cytoplasm. Now they are called Pri. oöcyte.
- * Nutrients of egg is called yolk. It is produced by liver. In yolk phospholipid present in maxm amount and Carbohydrate +nt in least amount.
- * Pri. oöcyte start meiosis-I division which is hindered / stop at ~~metaphase~~ prophase stage and Birth occur.
- * At the time of Birth egg is in Pri. oöcyte stage. Further development start at puberty.
- * At the time of Birth 4-5 lakh Pri follicle is +nt.
- * At puberty 60,000 - 80,000 Pri. follicle left in each ovary. remaining follicles are degenerate called atretive follicle. this process is called atresia.
- * At puberty meiosis-I complete in Pri. oöcyte. It is unequal division. Due to this 1 large haploid sec. oöcyte and 1 small haploid 1st Polar body is formed.

* Sec. oocyte ~~contains~~ written Bulk of nutrients and cytoplasm.

* Sec. oocyte start meiosis-II division which is stopped at metaphase stage and egg is released from ovary. This process is called ovulation.



At the time of ovulation egg is in Sec. oocyte stage.

*

meiosis-II completes in fallopian tube after entry of sperm during fertilization. due to this 1 large ovum and 2nd polar body is formed.

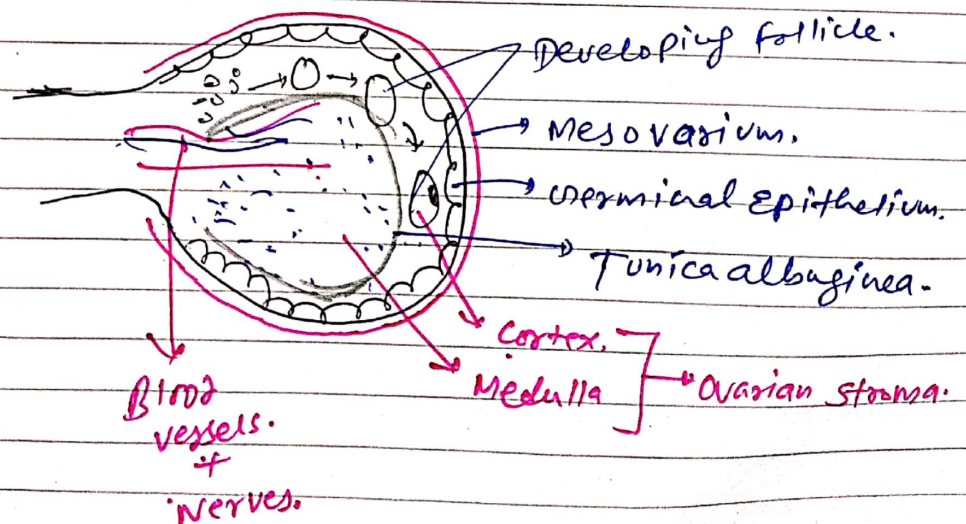
*

1 primary oocyte formed 1 ovum.



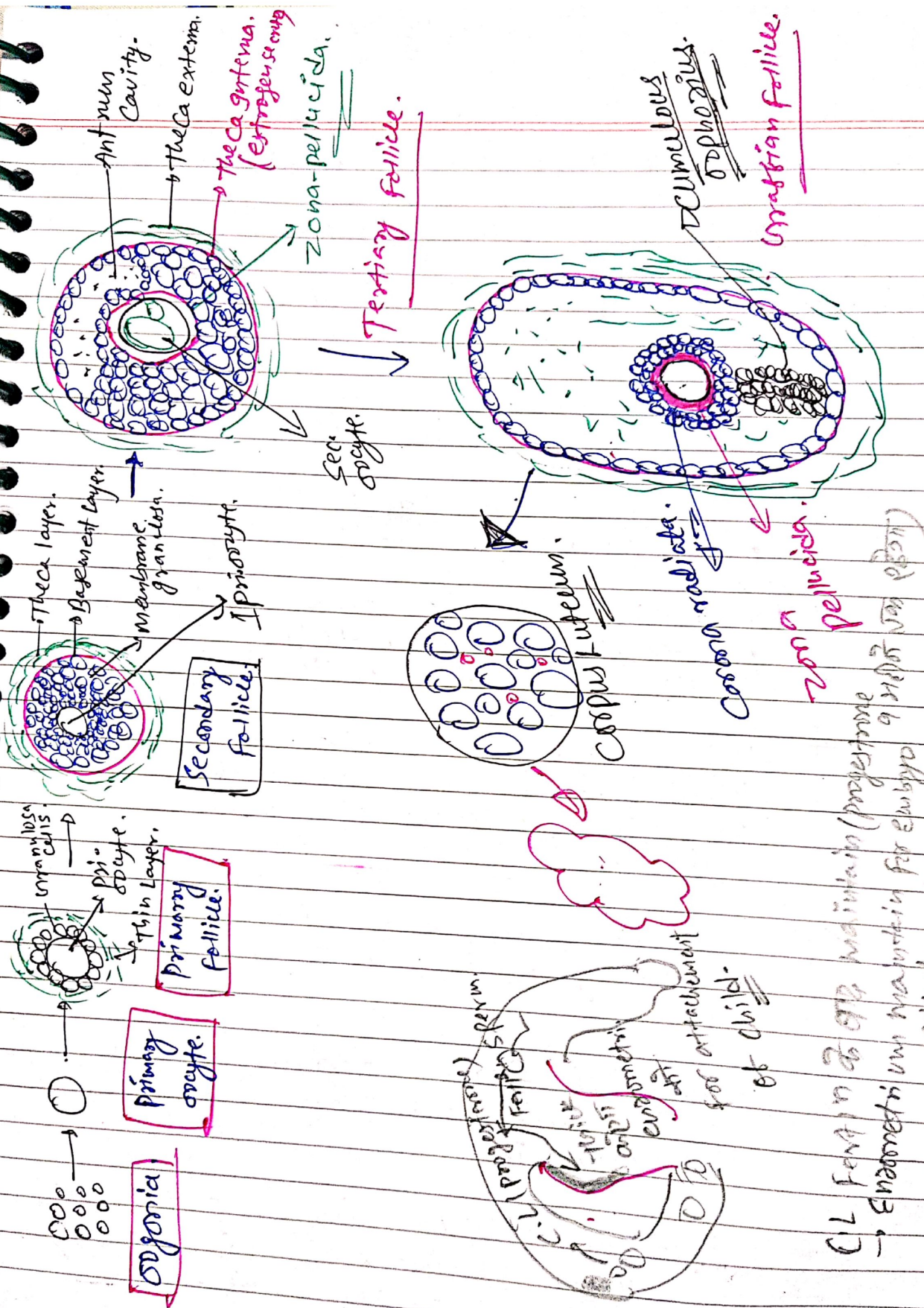
meiosis-I division start before Birth. and it completes at puberty before ovulation.

Structure of ovary.



* Ovary is covered by peritoneum Layer.
mesovarium. Ovary is lined by
germinal epithelium. In the cavity of
ovary connective tissue +nt called
ovarian stroma. It is divided into 2
parts.

- ① Cortex → Outer part, in this developing
follicle +nt.
- ② Medulla → Inner, central part. in this
Blood vessel, nerves, Lymph vessels +nt.



LH $\rightarrow$ HCG $\rightarrow$ Theca interna

- * In embryo stage primary oocyte surrounded a thin layer of granulosa cells. Now it is called primary follicle.
- * At puberty pri follicle change into 2nd stage follicle. In this multilayer of granulosa cells +^t around pri. oocyte (membrana granulosa) and thick layer of stroma (theca layer) +^t.
- * Secondary follicle ~~soon~~ ^{soon} transfer into tert. follicle.
- * A fluid filled antrum cavity appear in tertiary follicle. this fluid is called Liquor folliculi.
- * Theca layer differentiate into outer theca externa and inner theca interna. this theca interna is cellular, vascular layer. it secrete estrogen hormone.
- * Meiosis-I complete in primary oocyte in tertiary follicle stage and sec. oocyte formed.
- * Sec. oocyte secrete zona-pellucida layer. It is non-cellular layer, made up of glycoprotein.
- * Tertiary follicle change into mature graafian follicle. In this a large antrum cavity +^t.

And ~~egg~~ is connecting to membrana granulosa.
By a stalk called germ cell/ cumulus
oophorus.

* mammalian egg is covered by 2 egg membrane
(1) Corona radiata = outer layer, made up of
follicular cells, secreted by ovary. It's
cell connected by hyaluronic acid. It is
mucopolysaccharide.

(2) Zona pellucida = inner layer, Non cellular.
Made up of glycoprotein. It is secreted by
Sec. oocyte.

* - Due to high level of LH ovarian follicle
rupture and egg is released from ovary.
this is called ovulation.

* After ovulation ovarian follicle change into
Endocrine structure called corpus luteum.

* Corpus luteum secrete following hormone.

(1) Progesterone = in large amount.

(2) Estrogen

(3) Relaxin = in small amount during
child birth.

(4) Inhibin = It suppress FSH. In female it
is secreted by corpus luteum and
granulosa cells of developing follicle.

* If fertilization occur then corpus luteum
remain in ovary.

$$\begin{array}{r} 33 \\ 12 \\ \hline 21 \end{array} \quad \begin{array}{r} 21 \\ \times 12 \\ \hline 42 \\ 21 \times \\ \hline 252 \end{array} \quad \begin{array}{r} 207 \\ 45 \\ \hline 252 \\ 45 \\ \hline 997 \end{array}$$

gf fertil not occur than corpus
Luteum change into degenerating structure
corpus albicans.

Menstrual cycle.

* reproductive cycle in female is of 2 types

① Menstrual cycle.

* In this red fluid
comes out through
vagina.
Eg: primates, human,
monkey, apes.

② Oestrus cycle.

No fluid come out
through vagina.
Eg: remaining mammals.

→ 1st menstruation (beginning) is called
menarche.

→ It occurs at puberty. (11-13 years age.)

→ Stopes/stop of m.c → Menopause (around
50 years)

* In human m.c duration = 28 days.

* Menstrual cycle is divide into 3 phase :-

① (A) menses / Bleeding phase - ^{duration,} (3 to 5 days) in
this red coloured menstrual fluid comes
out through vagina. This fluid contain
Blood, mucus, cells of endometrium.

② Menses is due to lack of progesterone.

③ It is due to Break down of ~~endometrium~~ endometrium
- lining of uterus. total blood loss =
40 to 50 ml.

✓ estrogen and progesterone are with in
this phase.

* Menstruation can occur if released ovum
is not fertilised.

* Lack of menstruation may be indicative of
pregnancy.

* Menstrual fluid can't clot.

② Follicular phase / proliferative phase :-
it's duration is 7-8 days.
in this 2 events occurs.

① development of follicle and mature
graafian follicle is formed.

② Endometrium of uterus repair and
regenerate through proliferation.

→ It is due to an estrogen hormone.

→ In follicular phase gonadotropin (FSH + LH) hormones gradually increase. In this phase estrogen hormone also increases.

* progesterone hormone is absent in follicular phase.

* In later stage Estrogen rapidly increases and induce more secretion of gonadotropin. This is called +ve feedback.

** FSH and LH attain peak level in the middle of M.C.

* High level of LH is called LH surge which induce ovulation.

③ Luteal phase / secretory phase :→.

* After ovulation grantham follicle change into Corpus luteum. It's formation is induced by LH.

* Corpus luteum secrete large amount of progesterone and estrogen.

* progesterone is for maintenance of Endometrium for pregnancy.

* In this phase estrogen and progesterone high but FSH + LH low.

35
14
(21)

* progesterone increase glandular and vascular nature of endometrium.

* progesterone attain peak level in the secretory phase.

* Estrogen hormone is common in menstrual cycle.

During pregnancy level of progesterone + estrogen high. so, gonadotropin (FSH+LH) level low. due to this during pregnancy ovulation and menses absent.

✓ * After tubectomy ovulation and menstruation occur, but fertilization absent.

* After child birth lactation period present in mother. In this prolactin attain peak level so FSH and LH are high. due to this no ovulation and no menstruation, during this period. This is called Lactational amenorrhea. In this chances of fertilisation absent. It is max^m upto 6 months.

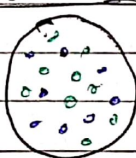
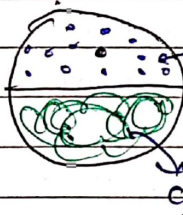
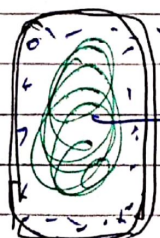
* Ovulation day = total ment. cycle length - 14.

* From 10 to 17th days of m.c is fertile period, in which ovulation and chances of fertilization occur.

(1) On the Basis of amount of yolk :-

S.No	Egg.	Yolk amount.	Ex :-
1.	Alecithal.	Yolk is negligible	Human eggs.
2.	microlecithal.	$Yolk < cytoplasm.$	Metatheria + Eutheria mammals.
3.	Mesolecithal	$Yolk \approx cytoplasm.$	Amphibia + Lung fish.
4.	Megalecithal. (macrolecithal)	$Yolk > cytoplasm.$	→ Reptiles. → Birds → Insecta. → Prototheria - mammals.

(2) On the basis of distribution of yolk :-

S.No	Egg.	Did.	Ex.
1.	isolecithal.		<u>Microlecithal.</u>
2.	Telolecithal.		<u>Mesolecithal.</u>
3.	Discoidal Egg		→ Reptiles → Bird → Prototheria.
4.	Centrolecithal.		Insecta

(3) on the Basis of shell.



Calc. shell

Cleidic egg covered by
eg:- Bird, reptiles, insecta.



non-cleidic

↓ have no shell.

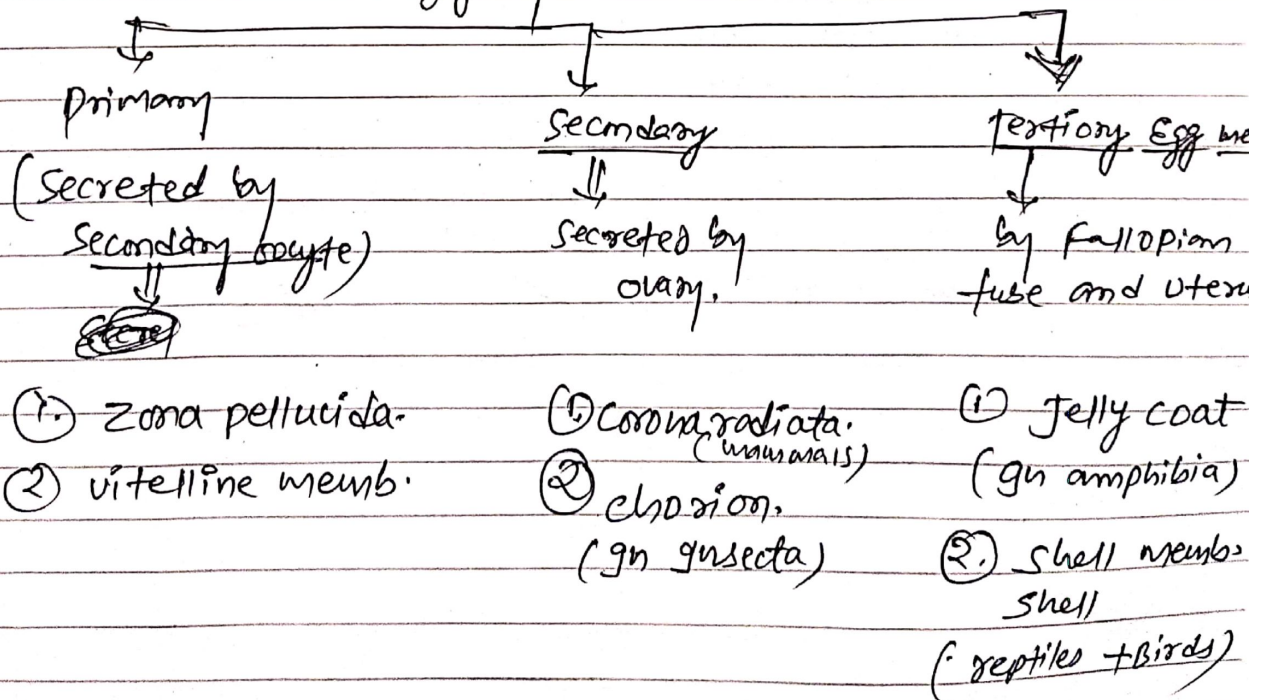
Ex:- amphibia, mammals,
fish,

* Hens egg = megalecithal + discoidal + cleidic.

* Rabbit egg → Microlecithal + isolecithal + non-cleidic

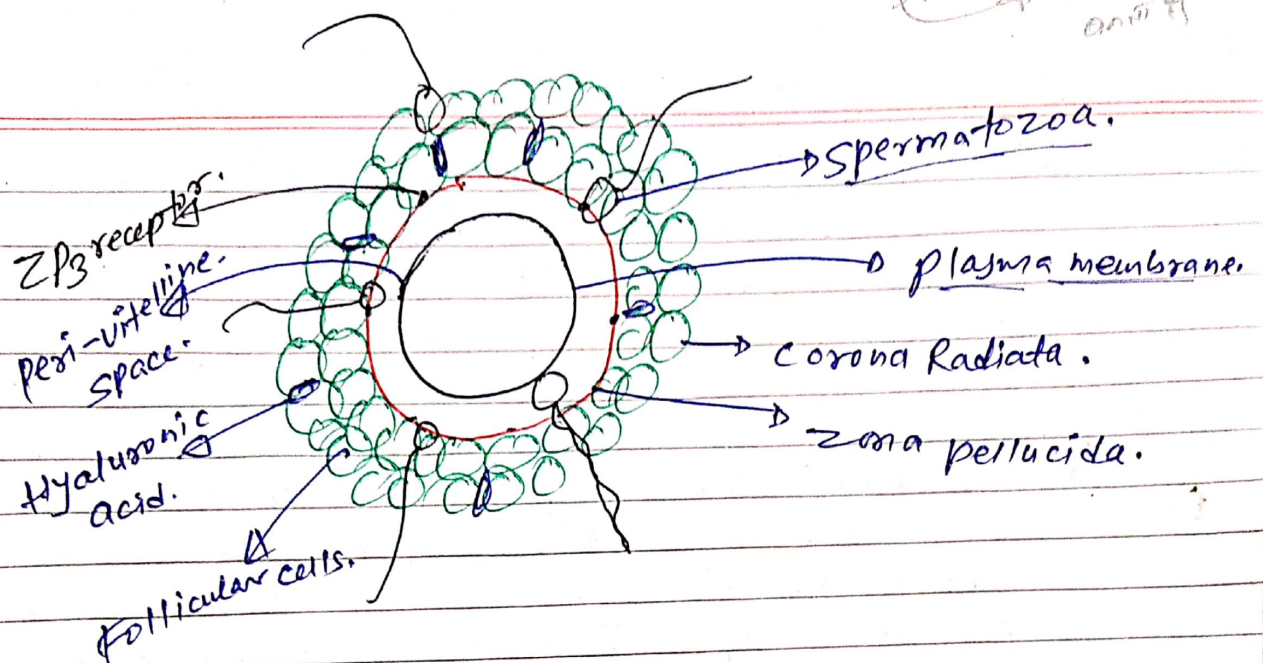
* Frog :- Mesolecithal + telolecithal + non-cleidic.

Egg-membrane



Fertilization.

- * fusion of male and female gamete and formed diploid zygote is called fertilisation. ZP3
- * Site of fertilisation = Ampulla region of fallopian tube. pcsi
- * fertilisation can occur if sperm and ova transported in fallopian tube simultaneously. Hyc
- * All copulation not lead to fertilisation.
- * During fertilisation following events occur.
- (1) Insemination — Release of sperm into female genital tract by male. After insemination sperm swim through vagina, cervix, uterus and finally reach to fallopian tube.
- (2) Capacitation — process by which sperm gain fertilizing capacity to fertilize egg is called Capacitation.
- ** Capacitation occurs in female genital tract.
- ** During capacitation thin cholesterol layer and inhibitory protein remove.



(3) Acrosomal Reaction: → Acrosome of sperm contain enzymes to dissolve egg membrane. these are called sperm lysins. 3 enzymes secreted by mammalian sperm.

(a) Hyduronidase enzyme: →
gt dissolve hyaluronic acid of follicular cells of corona-radiata.

(b) Corona penetrating enzyme: →
gt dissolve corona radiata layer.

(c) Zona lysin / Acrosin enzyme: →
gt dissolve zona pellucida layer.

* Ca^{+2} gm play major role in Acrosomal rxn.

(4) Block the polyspermy :-

Entry of more than 1 sperm is called polyspermy. It can be prevented by 2 methods.

(a) - Dipolarisation of plasma membrane due to influx of Na^+ . Also plasma membrane of egg become impermeable for other sperm. This is called fast block of polyspermy.

(b) Cortical granules of eggs $\Rightarrow$ release enzymes due to influx of calcium. Due to this zona-pellucida become hard, impermeable for other sperm. This is cortical rxn. It is slow block of polyspermy.

(5) Reception Conformation.

At contact place of sperm plasma membrane of egg form reception cone. This reception cone with sperm absorbed into cytoplasm of egg.

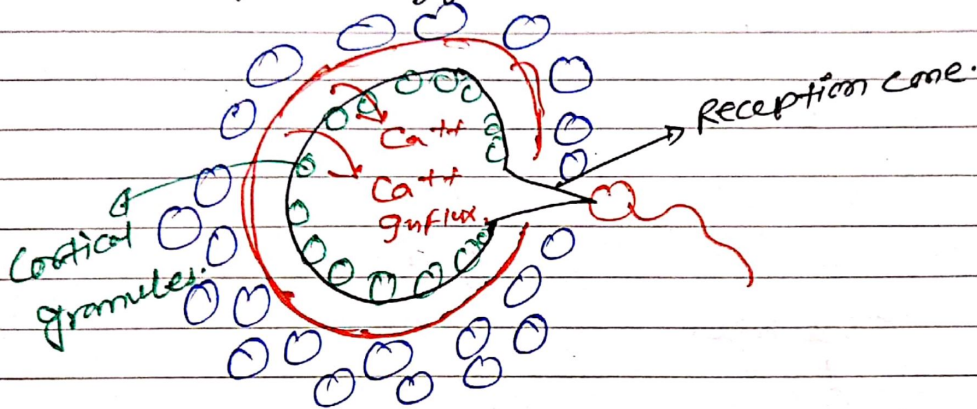
(6) Meiosis-II Completion.

After entry of sperm meiosis 2nd complete in secondary oocyte so, 1 ovum + 2nd polar body is formed.

** In mammals whole sperm enter into egg.

* In the cytoplasm of ovum only nucleus + proximal centriole remain.

* Nucleus of both gamete move to each other through fertilisation path and formed diploid zygote.



CLEAVAGE

Unicellular zygote convert into multicellular Embryo by rapid mitosis cell division.
- these mitosis cell division called cleavage.

Cells which are produced by cleavage called Blastomeres.

* During cleavage no. of Blastomere increase and ~~of~~ size of Blastomere decrease.

✓ * During cleavage size of Embryo remain same.

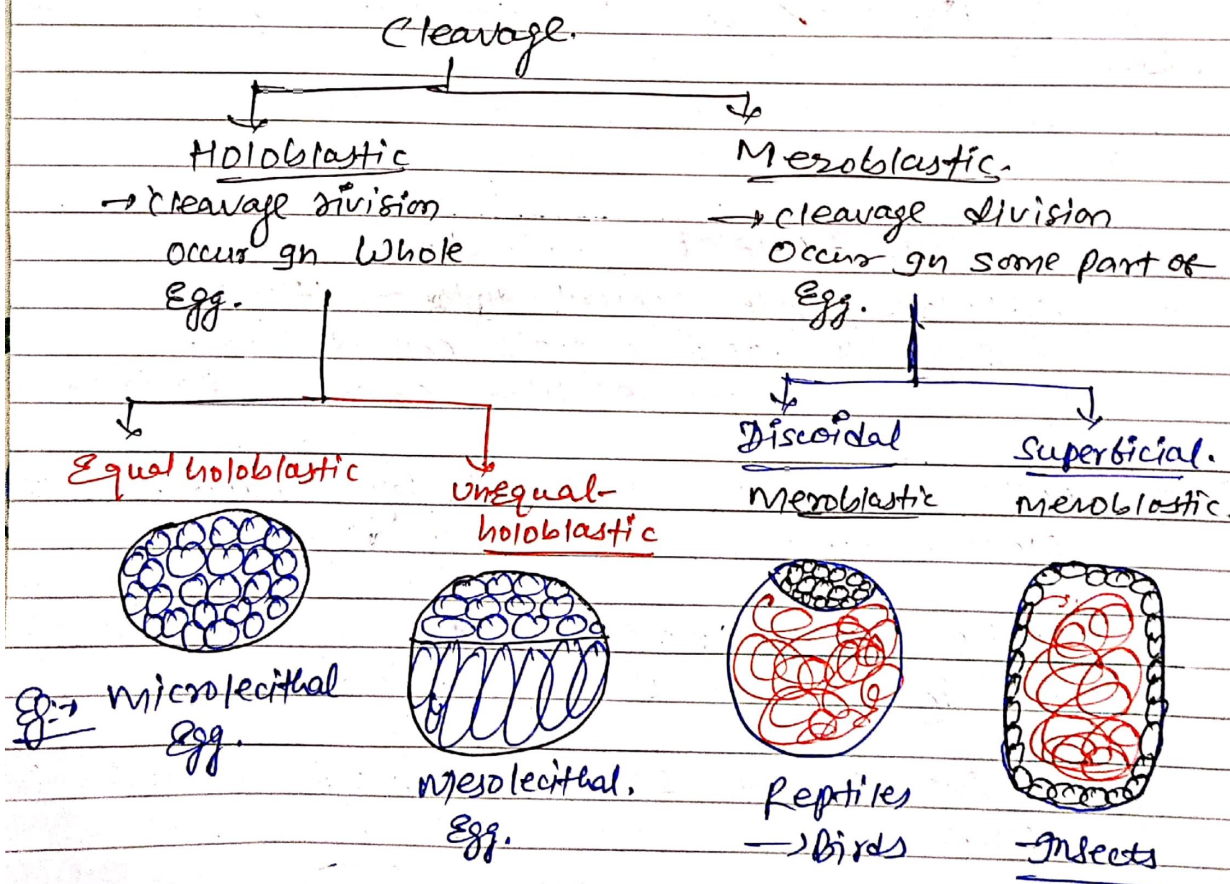
* During cleavage interphases short - In this G₁ + G₂ phase absent but S-phase present.

During cleavage DNA-mass increase,
O₂ consumption increase but cytoplasm
amount not increased.

* Nucleolus absent in nucleus of
Blastomeres.

Balfour's Law :-

Cleavage Rate $\propto \frac{1}{\text{Yolk amount}}$



⊕ Cleavage division start in zygote when it move into fallopian tube, towards gestation.

* Due to cleavage division 2, 4, 8, 16, 32 and 64 cell stage is found.

* In human 1st cleavage division occurs after 20-22 hrs. of fertilization.

* 8-16 celled solid ball like structure is known as morula.

* Zona-pellucida still +nt in morula stage. Morula enter into uterine cavity.

→ Morulla convert into hollow wall called blastula. It's cavity is called Gastrocoel.

→ Blastula of mammals is called Blastocyst. It contain 64 cells. In this cells arrange in 2 layer.

→ Outer layer is called = Trophoblast

→ Inner layer " " = Inner cell mass / Embryonal knob.

* Inner cell mass differentiate into Embryo. and Trophoblast help in attachment of Embryo to Endometrium and also in Placenta ~~at~~ formation.

* Cavity of Blastocyst is called albumin cavity in which uterine fluid +nt.

Fertilization → Zygote → Blastula → Gastrula

* zona pellucida is removed in Blastula stage. It prevent implantation at abnormal site.

* If implantation and embryo development occur at any other site except uterus then it is called Ectopic pregnancy.

* Blastocyst attached with endometrium of uterine wall. After attachment endometrium cells divide rapidly. This thick layer is known as Decida. This endometrium covers an embryo and now embryo embedded into endometrium of uterus this process is called implantation.

*** At the time of implantation Embryo in Blastula stage.

* Implantation occurs at 7/8 day after fertilization. It is due to progesterone hormone.

* Blastula convert into gastrula stage. This process is called gastrulation.

* During gastrulation 2 events occur.
(i) cells show morphogenetic movement.
(ii) formation of 3 germinal layer.
(Ectoderm, mesoderm, Endoderm)

* Morphogenetic movements are of two types.

Epiboly
* movement of ^{we} Ectoderm forming cell.

Emboly
* movement of Endoderm and mesoderm forming cells.

→ cavity of gastrula is called archenteron.

Opening of archenteron cavity is called blastopore. So blastopore is found in gastrula stage.

* In human gastrulation process occurs in 2nd week, in this inner cell mass differentiate into 2 layer.

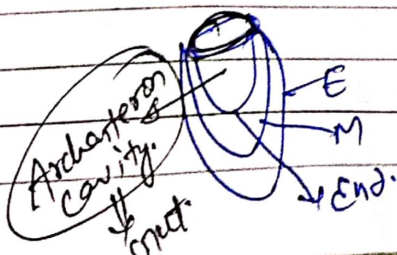
① Epiblast Layer = outer, made up of columnar cells.

② Hypoblast layer = inner, made up of cuboidal cell.

* Epiblast Layer form Ectoderm and hypoblast Layer form Endoderm.

* A mesoderm layer soon appear b/w Ectoderm and Endoderm. So, Embryo convert into 3 layered disc.

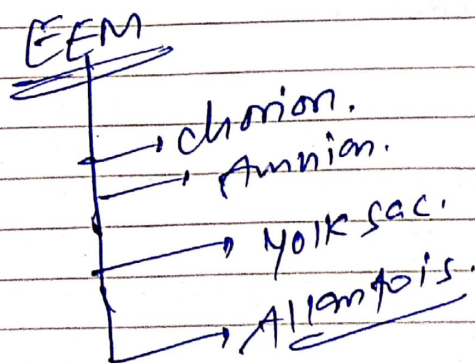
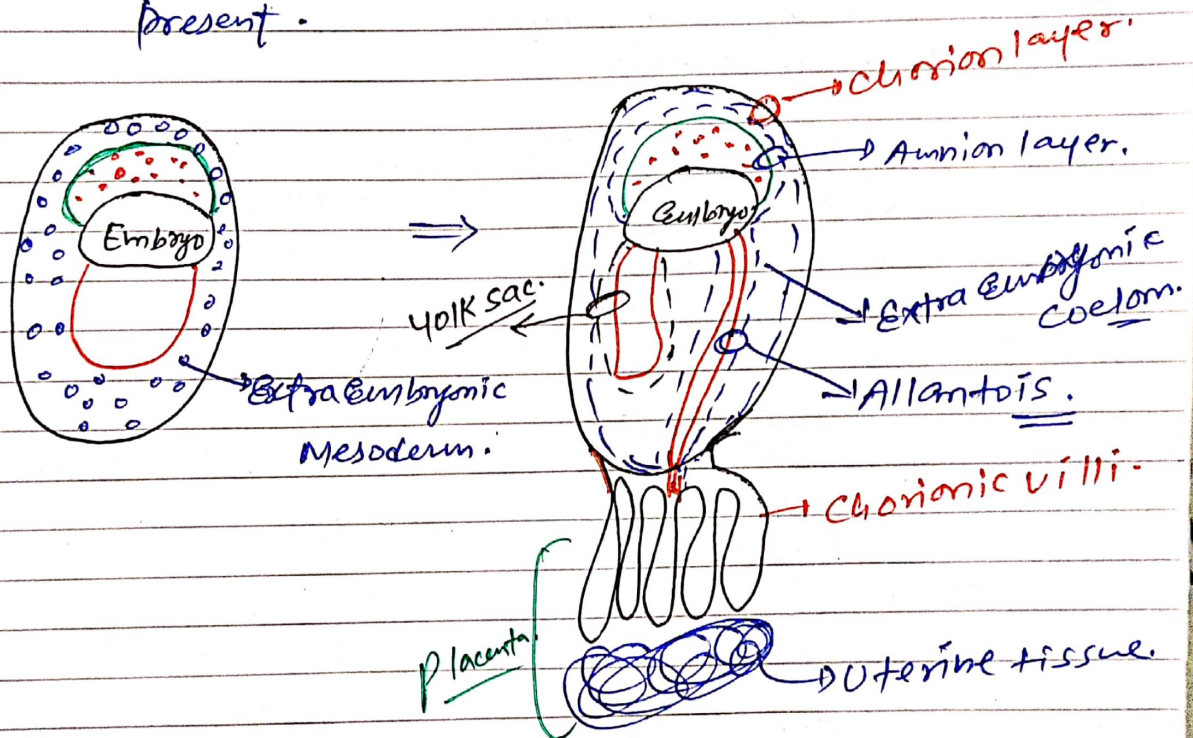
Some stem cells also +nt in disc, have property to produce any tissue.



(PBC) Yolk sac → Liver → spleen → Bone marrow

* Trophoblast layer divide and form amniogenic cells. Which arrange in a layer.

* A cavity appear b/w embryonic descent, amniogenic cells layer this is called Amniotic cavity, in which amniotic fluid + h₂O in this fluid some Embryo cells present.

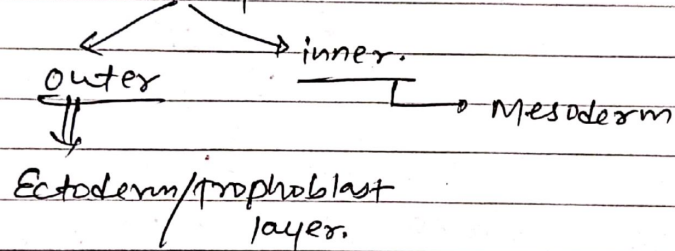


① Reptile + Birds + mammals are called Amniota.
In this embryo is surrounded by 4
Extra Embryonic membranes.

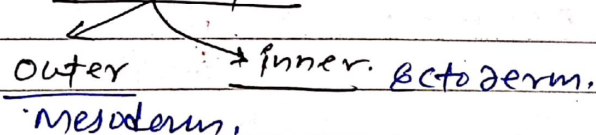
② Fish and amphibia have no Extra Embryonic
membranes.

③ Extra Embryonic membranes are.

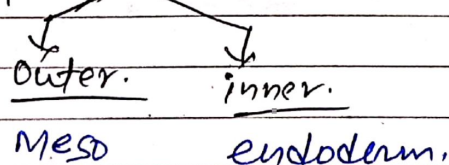
① Chorion layer :-



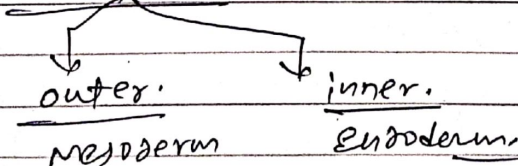
② Amnion layer.



③ Yolk-sac.



④ Allantois.



impl $\rightarrow$ Blastula.
Germ layers $\rightarrow$ gastrula.

① Chorion is for protection and help in the formation of placenta.

② Amnion layer secrete fluid which prevent desiccation of embryo and acts as shock absorber.

③ Yolk-sac is for storage of yolk in (reptile + Bird). In mammals it produce Blood cells.

④ Allantois acts as a urinary bladder of a embryo. In mammals it form umbilical cord.

* gastrulation occur in 2nd week after fertilizn.

* neurulation occur in 3rd week after " .

* 1st develop germ layer = Ectoderm.

* " " Structure = neural tube.

* " hemopoietic organ = yolk sac.

* " develop tissue = Epithelial tissue.

* " " organ = heart.

Placenta.

After implantation trophoblast layer form finger like projects called Chorionic villi. These villi embedded into uterine tissue and form placenta.

* Placenta is formed by both Embryonal tissue and maternal tissue. It is functional unit b/w developing embryo and mother.

* Umbilical chord is 50-60 cm long tube, made up of mucoïd connective tissue. It is derived from Allantois layer. It contain Umbilical artery and Umbilical vein.

* Umbilical artery contain deoxygenated blood.
" vein " oxygenated "

* " Cord " 100% Foetus "

* Placenta transport gas, nutrients, waste-products b/w mother and foetus.

* Estrogen → theca interna, col, placenta.
Same prog → ovary (C.L), placenta.
3-4th → ovary
6-15th → placenta.

* Placenta is a temporary Endocrine structure.
It secretes following hormones.

- (1) Progesterone.
 - (2) Estrogen.
 - (3) HCG. (Human chorionic gonadotropin).
 - (4) HPL. (" Placental Lactogen).
 - (5) HCC. (" Chorionic corticotropin)
 - (6) HCT (" " Thyrotropin).
 - (7) Relaxin.
- ↓
Steroidal nature.
Protein nature.

* Main pregnancy hormone is progesterone.
It is secreted by ovary and placenta.

~~**~~ During pregnancy progesterone ↑↑ (High)
estrogen ↑↑ (high).

* HCG is secreted by trophoblast cells. It
maintain corpus luteum during pregnancy.
and induce secretion of progesterone.
So, HCG similar to LH in function

*
* . Around 10 week of pregnancy HCG
secretion decline..

* Presence of HCG in urine is confirmation
test of pregnancy. (uravidex test)

* HCG, HPL, Relaxin are produced only
during pregnancy.

- * Relaxin is ~~also~~ secreted by ovary + Placenta.
- * During pregnancy progesterone + estrogen + cortisol + thyroxin + prolactin hormone increased, several times in maternal blood.

Gestation period.

Time duration b/w implantation and child birth is known as gestation period.

- * First sign of growing foetus noticed by listening of heart sound.

* End of 1st month of pregnancy = Heart.

* " " 2nd " " " = Limbs + Digit

* " " 3rd " " " = Major organ system
(12th week) (External genitalia dev.)

* During 5th month of preg = 1st movement of foetus + head is covered by hair.

* End of 6th month / 24 week = Body is covered by fine hair + eyelids separates + eyelashes Formed.

Child birth / parturition

* Parturition is a complex neuroendocrine mechanism.

① The signal for parturition originate from fully developed foetus and placenta.

② During parturition following events occur.

① CRH from Hypothalamus of foetus released

② Adrenal gland of foetus release cortisol.

③ Secretion of oestrogen from placenta ↑↑.

④ " " progesterone " " ↓↓.

⑤ Oxytocin hormone is released from maternal pituitary gland. It act on smooth muscles of uterus and causes uterine contraction.

High level of oxytocin causes stronger and stronger uterine contraction, this is called labour pain.

⑥ Relaxin is secreted by [placenta + ovary]. It causes dilation of birth canal by loosening pubic symphysis.

⑦ prostaglandin also secreted during child birth.

⑧ After child birth placenta is also expelled out, ~~strongly~~ from uterus.

Type of Placenta in human.

① Chorionic placenta.

② Discoidal " → villi + nt only at implantation site

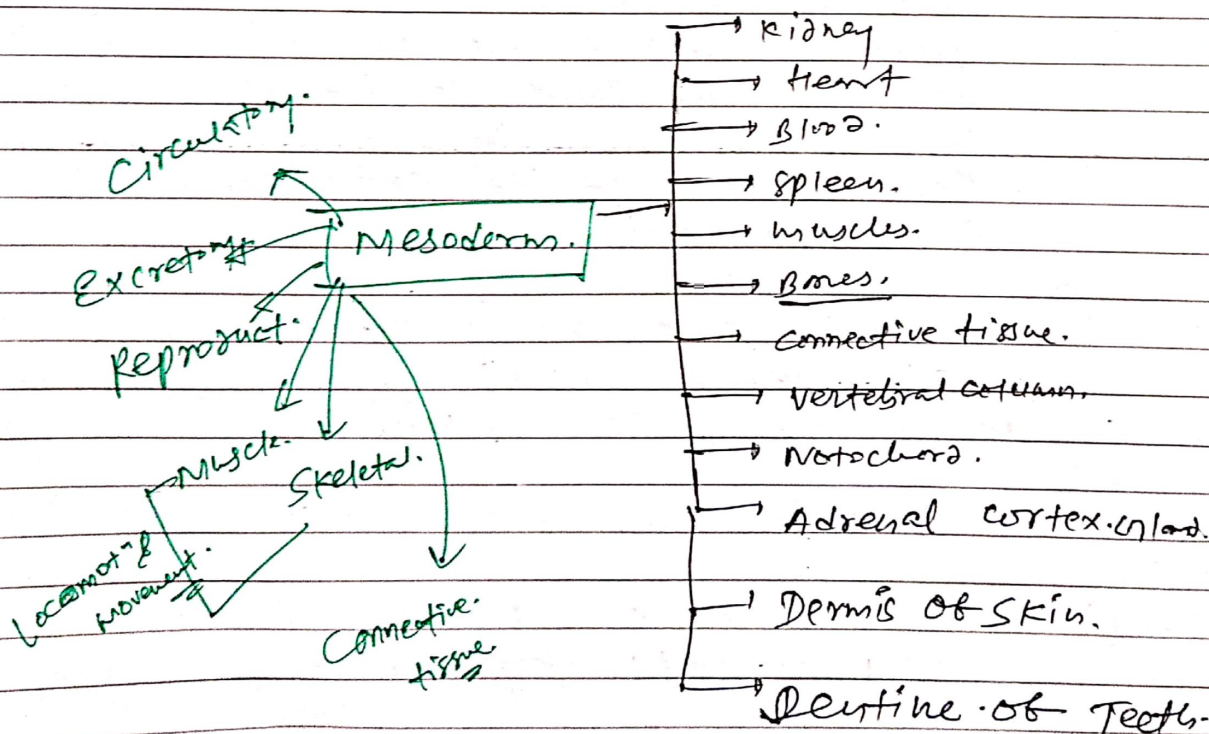
③ Deciduate " . In rhes form.

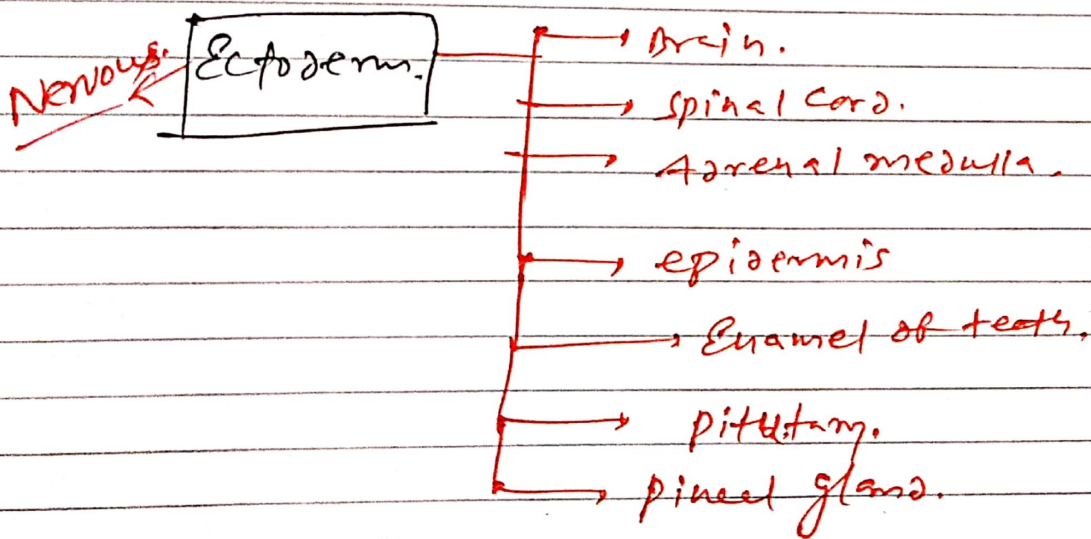
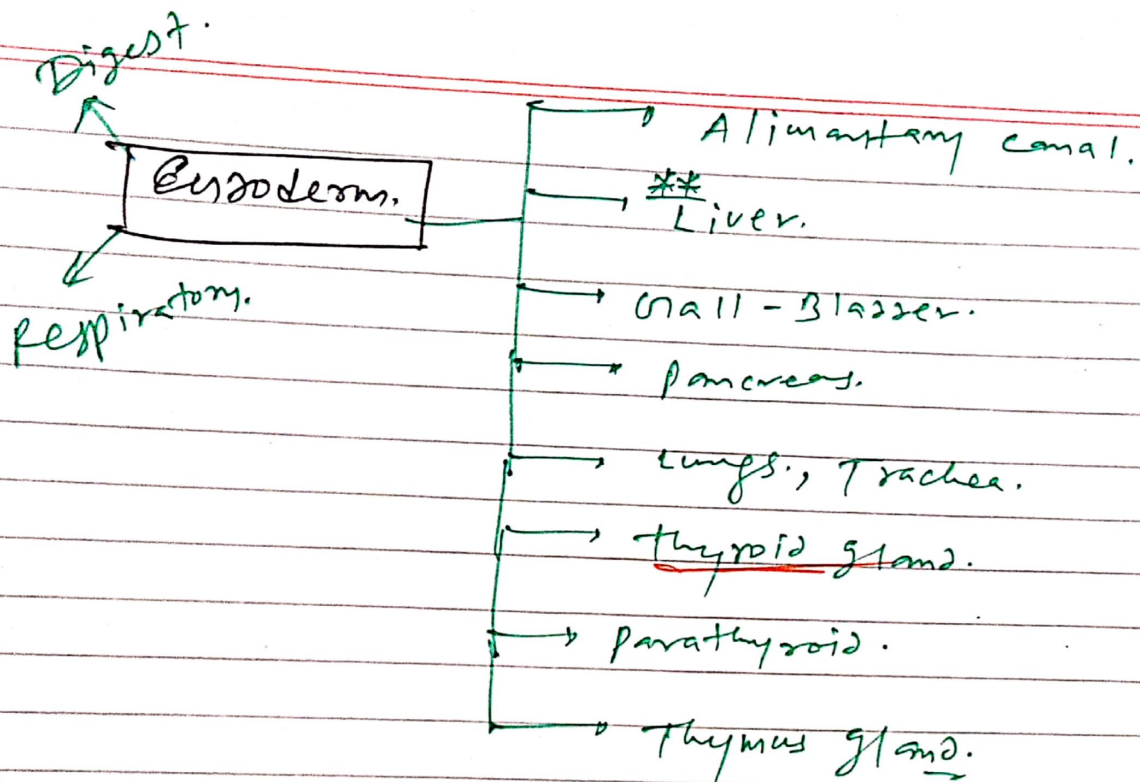
↓
Villi Embedded in uterine tissue.

(Strong connection).

④ Haemo-chorial placenta: →

(villi bath in maternal blood, maternal barriers absent)





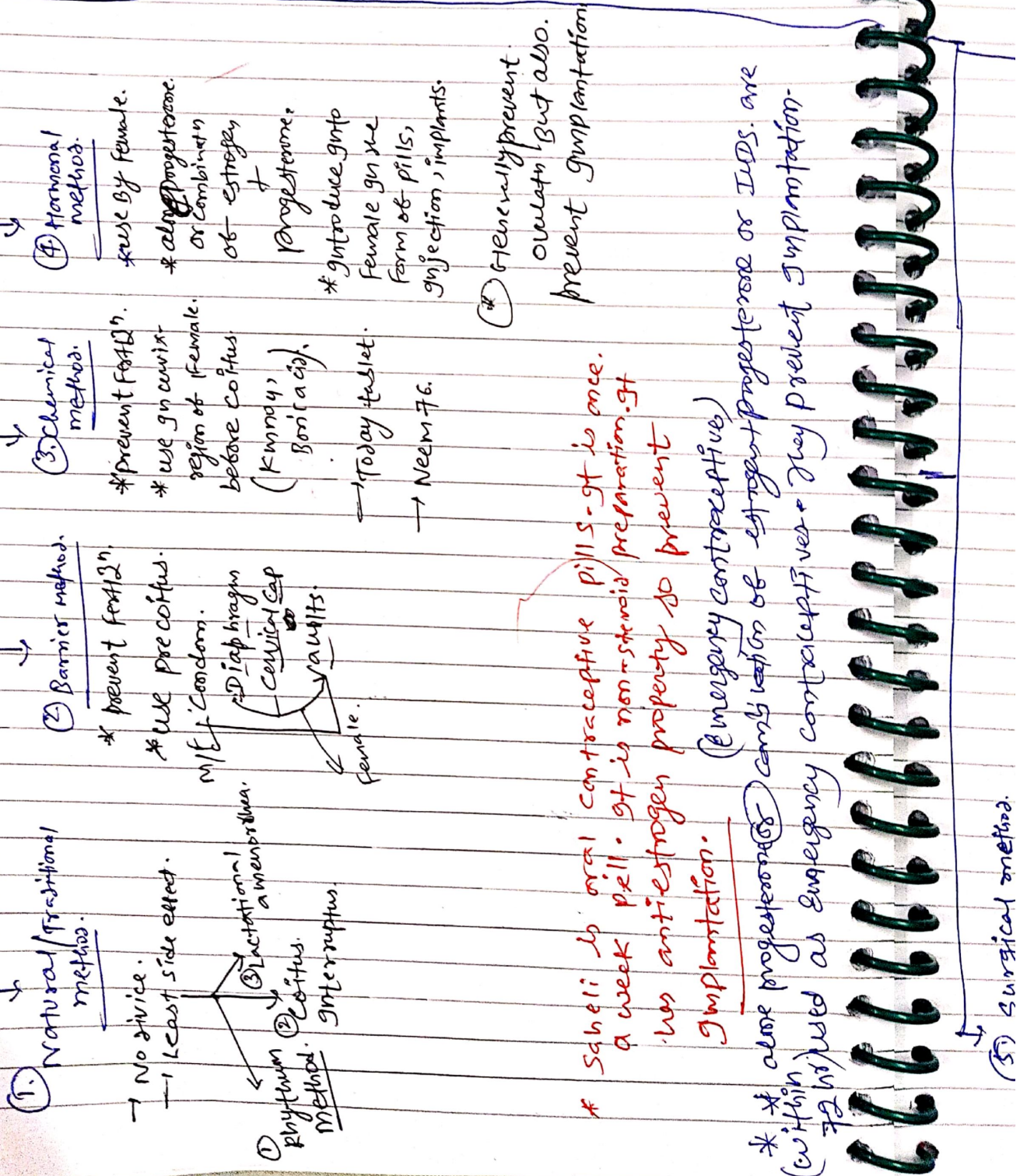
③ Saheli
Comes a
week.
(with 2
4th)
* Dipropovone

NEET
KOTA
UNWAD

Reproductive - health.

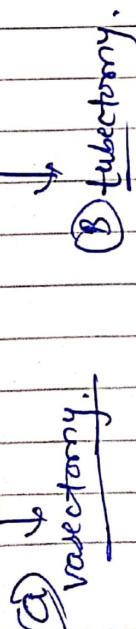
* India was first country started Family programming plan on 1951.

Contraceptive methods.



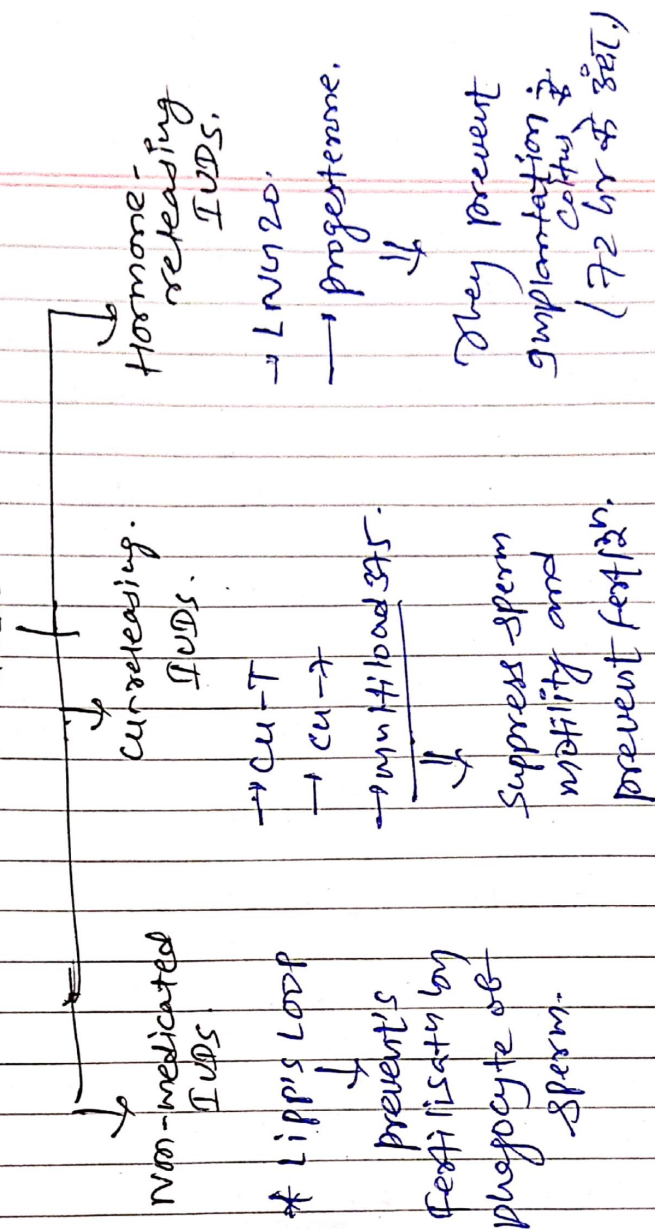
⑤ Surgical method. (Sterilisation)

- * Block gamete transport and prevent fertilisation.
- * highly effective, reversibility poor.



IUD's. (Intra-uterine device).

- * Females who want delay pregnancy use IUD's.



<u>Device.</u>	<u>method.</u>	<u>prev.</u>
① LNU 20	<u>hormonal</u>	<u>implantation.</u>
② cervical cap.	<u>Barrier.</u>	<u>Fertile.</u>
Saheli.	<u>hormonal</u> <u>contraceptive.</u>	<u>Ovulation.</u> <u>implant</u>
Tubectomy.	→ <u>Surgical.</u>	<u>Fertile.</u> ✓
Multiloop-375.	<u>Cu++</u> <u>Hormonal.</u>	<u>Fertile.</u>
Vaults.	<u>Barrier.</u>	<u>Fertile.</u>
Coitus interruptus.	<u>Natural.</u>	<u>direct</u> <u>Fertile.</u> <u>insemination.</u>
Implants.	<u>Hormonal.</u>	<u>Fertile.</u> <u>ovulation.</u>
Lipp's Loop.	<u>Non-Med.</u> <u>Hormonal.</u>	<u>Implantation.</u> <u>Fertile.</u>
Progestin.	<u>Hormonal.</u>	<u>Implantation.</u>

I Infertility.

(*) If Fertilisation occurs outside the body of female in Laboratory i.e. called. In-vitro Fertilisation.

(*) If Fertilisation occurs inside female body then it is called In-vivo Fertilisation.

(A) Test tube Baby programme: In this Fertilisation occurs in test tube and development occurs in body.

(*) Embryo upto 8 Blastomere is transfer into Fallopian tube. This is called ZIFT.
(Zygote Intra Fallopian transfer.)

(*) Embryo more than 8 Blastomere transfer into uterus. This is called IUT (Intra uterine transfer)

2nd. Artificial Insemination (A.I)

If male is unable to inseminate semen or very low sperm count then A.I method use.
→ In this, semen is artificially inseminate into vagina or uterus. (Intra uterine insemination)

→ Fertilisation and development occurs in female body. (In vivo).

3rd

ICSI (Intracytoplasmic Sperm Injection) →
In Laboratory sperm is injected into egg by penetrating zona-pellucida then Embryo is transferred into female body.
(In vitro)

(D) GIFT (Gamete Intra fallopian transfer)
While Female who can't produce ova But
provide suitable environment for fertilization and
development, use GIFT method. In this
Egg from donor female and sperm transfer
into Fallopian tube.

STDs (Sexual transmitted disease).

These diseases are transmitted by sexual
intercourse.

Ex: →

Gonorrhoea.

Syphilis.

— Genital warts.

— Genital herpes.

— Hepatitis-B.

→ AIDS.

→ Trichomoniasis

→ Chlamydiae.

* Hepatitis B + AIDS = STDs But also Transmitted
By Blood transfusion, sharing of needle,
Mother to Foetus.

* HepB + Aids + Genital herpes are non-curable.

* Complications of STDs are Sterility, Abortion,
Ectopic preg, Cancer in R.T, PID,

Cancer

reproduct. /
pelvic inflammatory
disease.

MTP :- (Medical termination of preg)

* Intentionally/voluntary :- Termination of preg.
Before full term is called MTP.

* In 1971 MTP is Legalised in India.

* 1st trimester MTP is safe, and 2nd Trimester
MTP more risky.