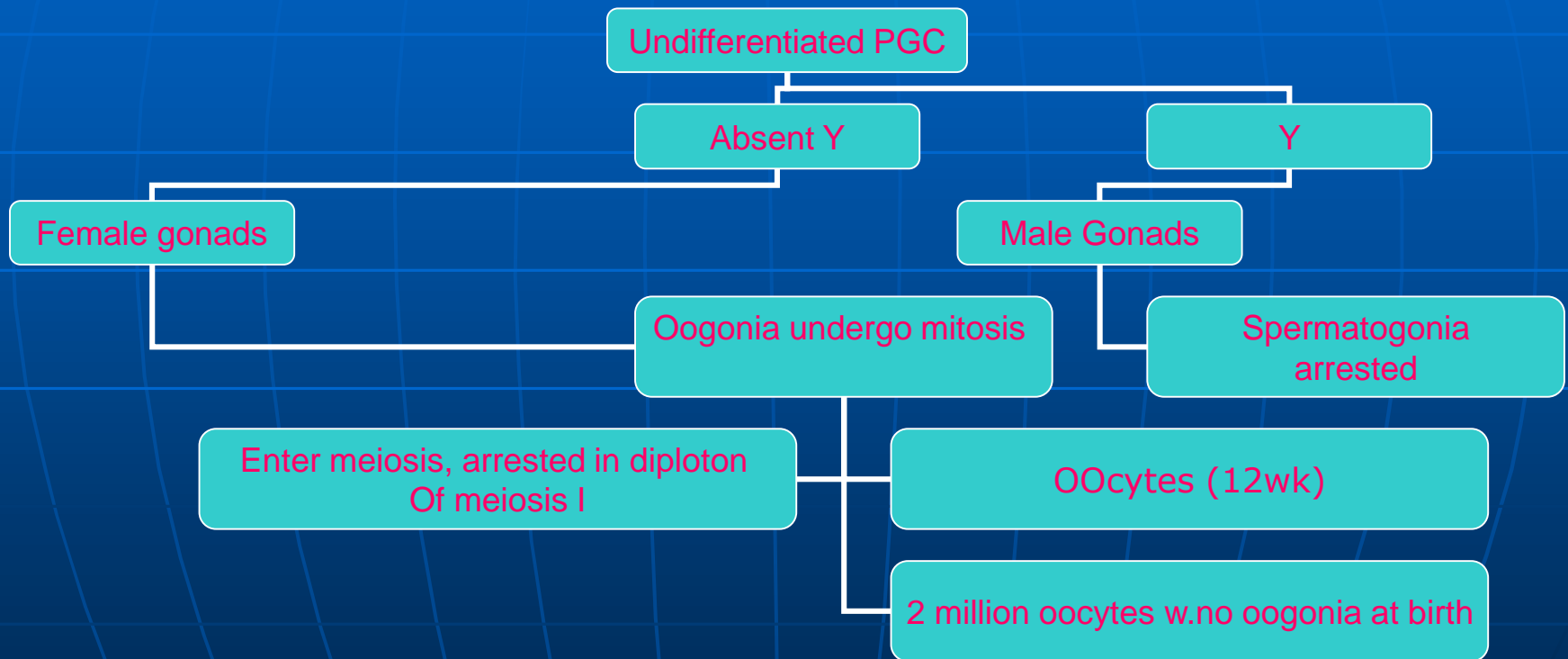


# Gametogenesis

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# Undifferentiated Germ cells

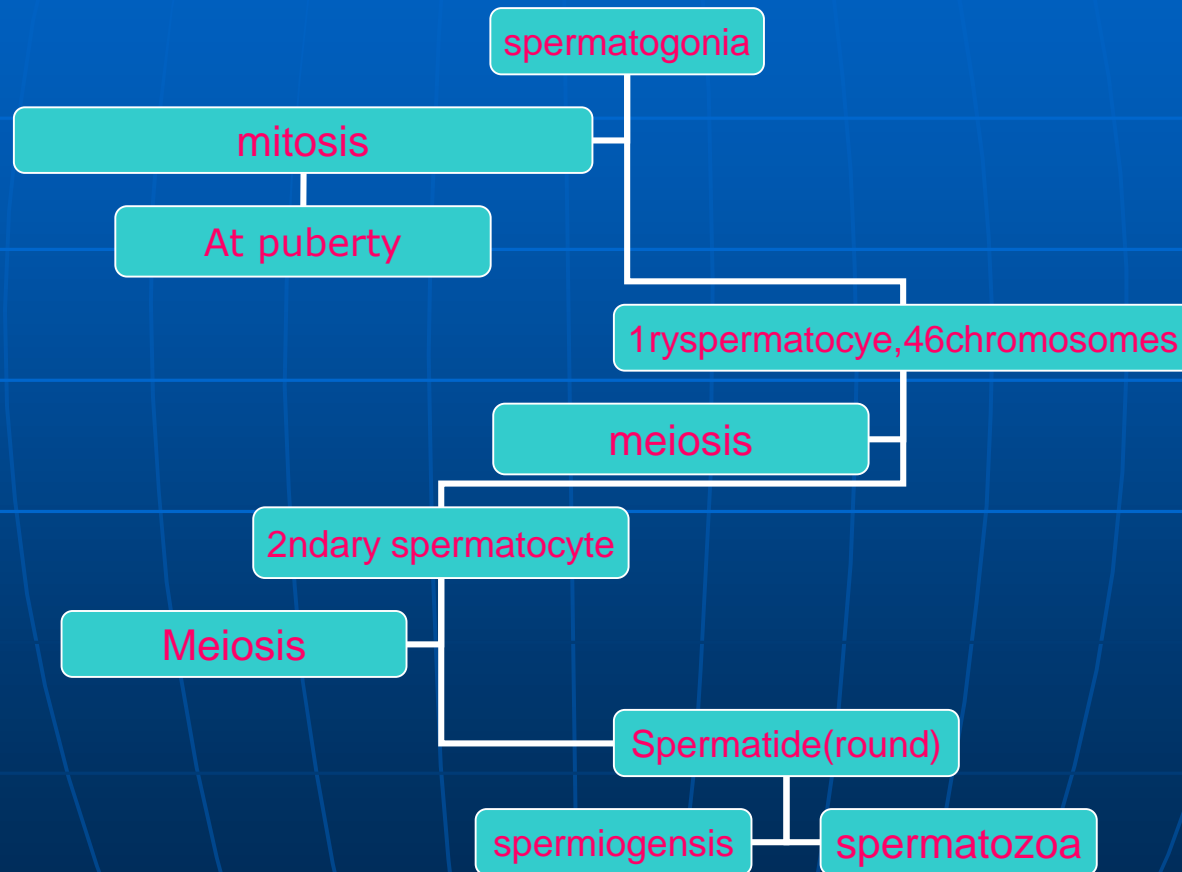


# Spermatogenesis

- Start at Puberty
- Occurs in seminiferous tubules
- Takes 64 days



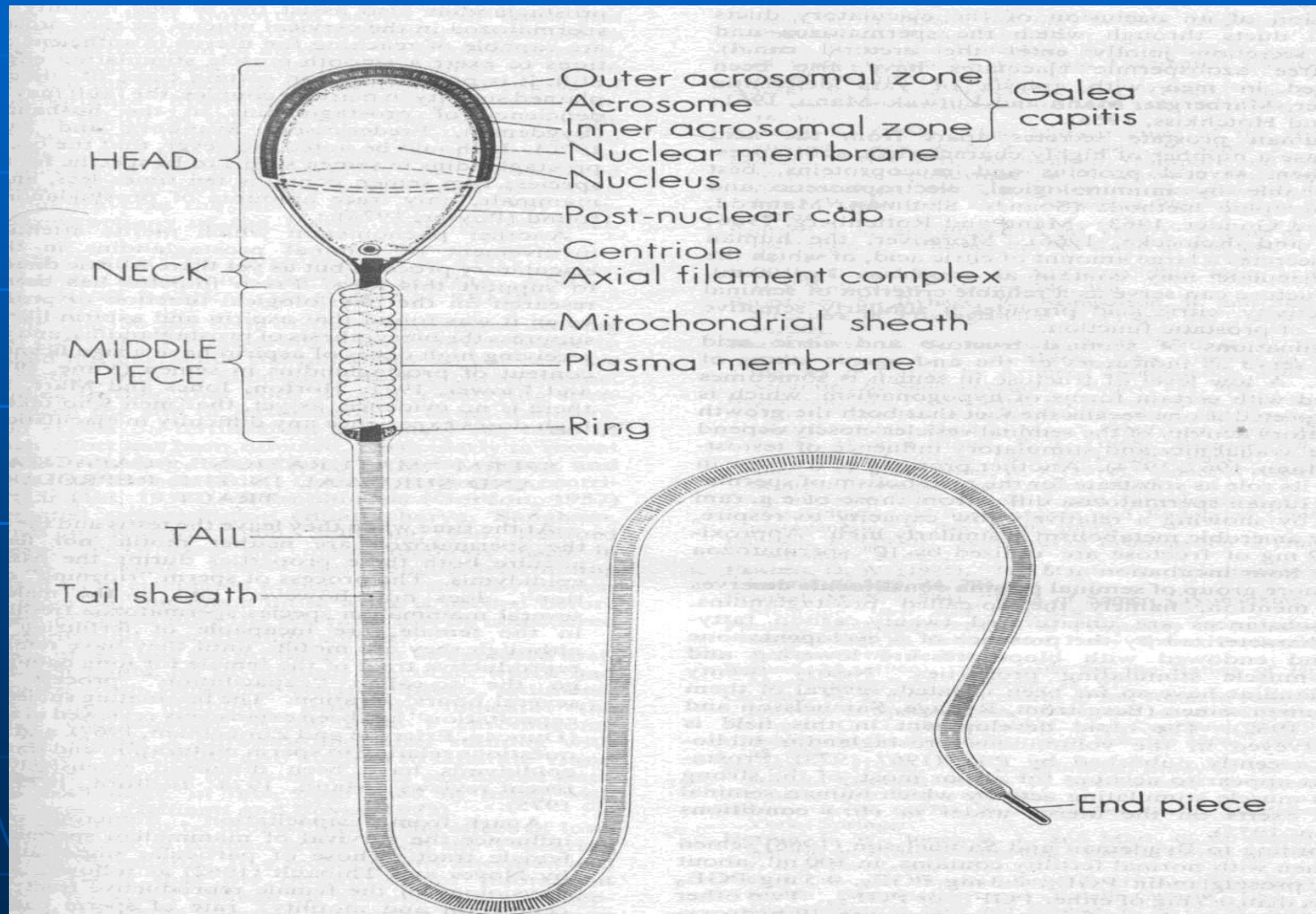
# Spermatogenesis



# Spermiogenesis

- Spermatide differentiate into spermatozoa (seminiferous tubules)
- 1-DNA condensation
- 2-Acrosome, middle piece and tail appear
- 3-Most of cytoplasm eliminated

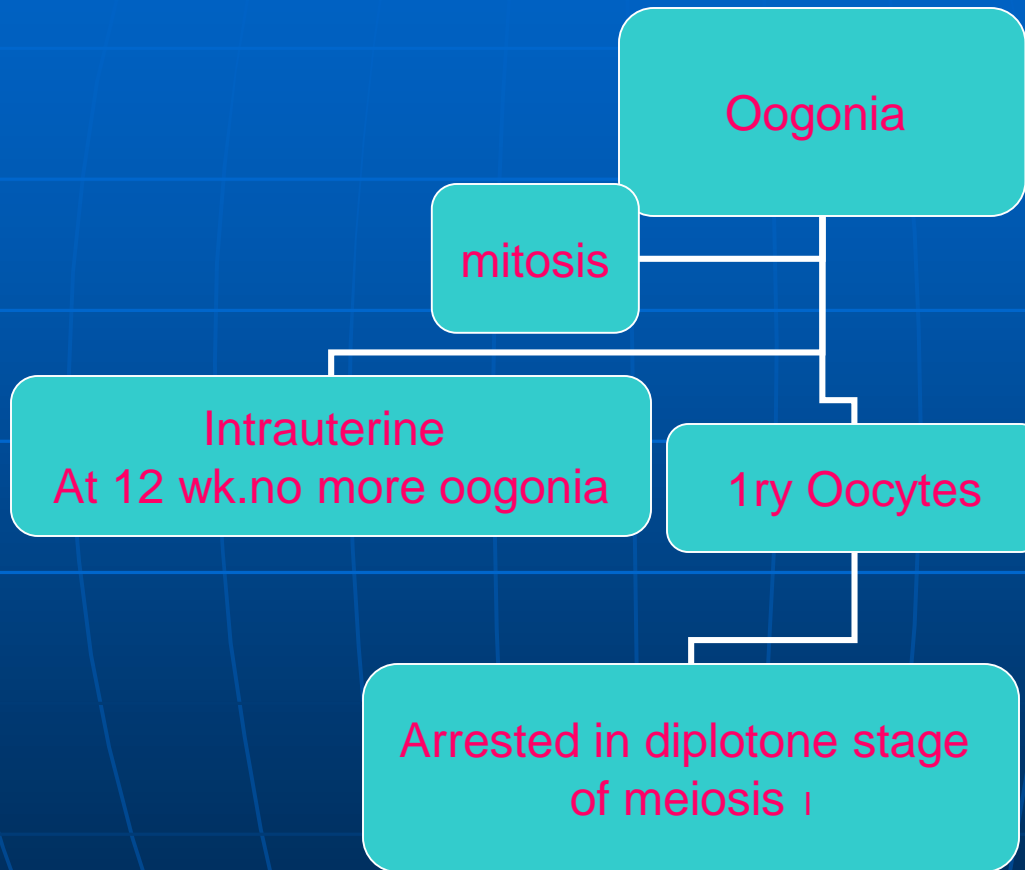
# Spermatozoa



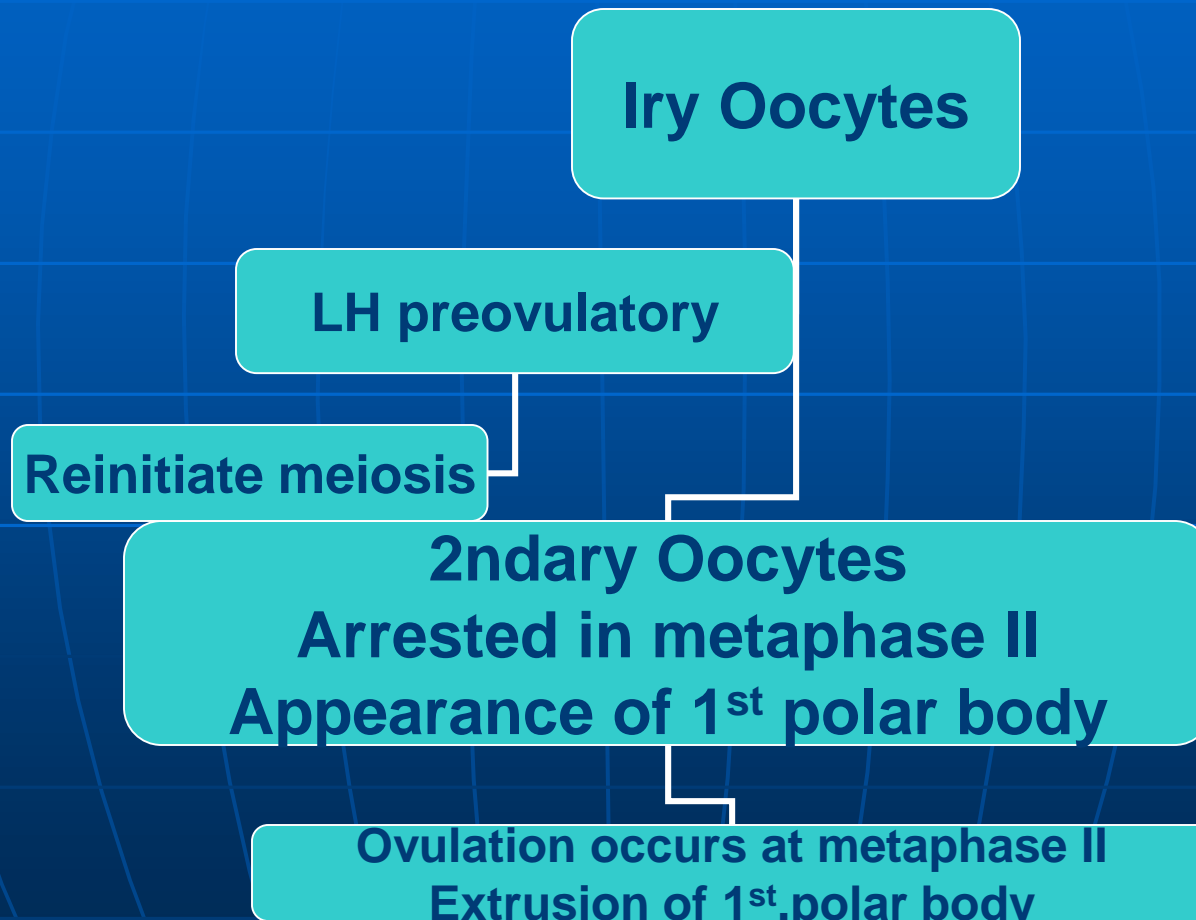
# Oogenesis

- Initiated in follicles in the ovary but is completed in the fallopian tube
- Begins during Fetal life
- Time for completion: 15 to 50 years
- Passes thorough 3 phases
  - -Phase I intrauterine
  - -Phase II ovary (during ovulation)
  - -Phase III tube (during fertilization)

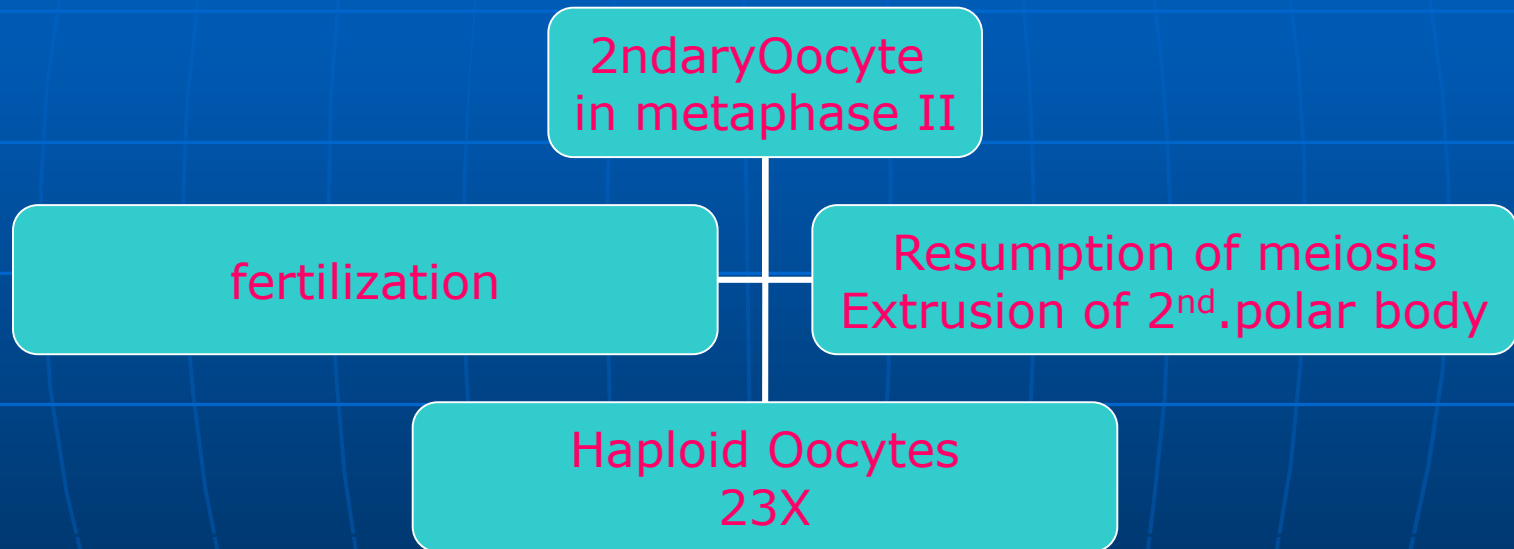
# Phase I Oogenesis



# Phase II Oogenesis



# Phase III Oogenesis



# SPERMATOGENESIS

BIRTH

COMMENCE  
AT  
PUBERTY

64 days



FERTILIZATION

<24 hours

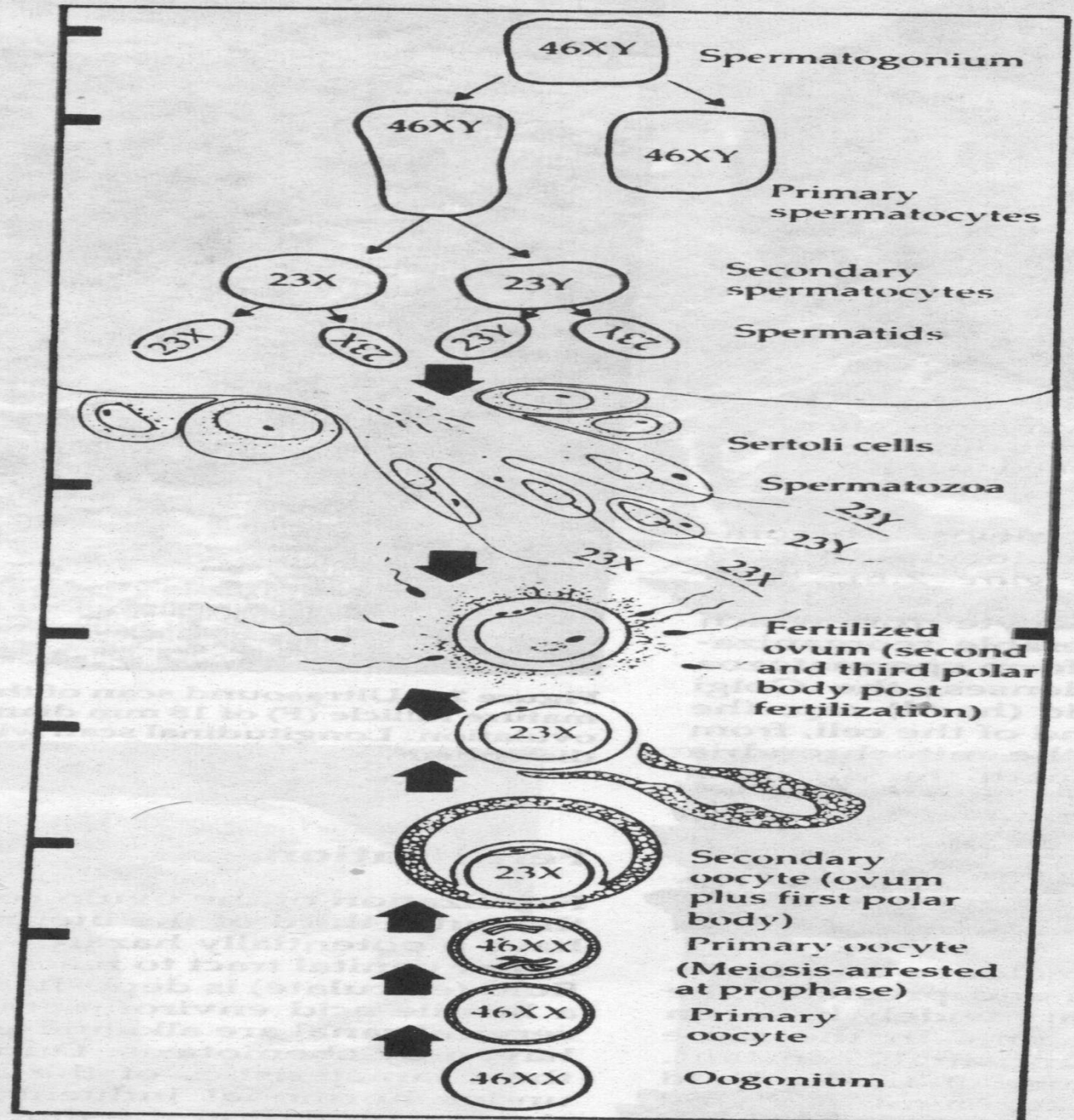
OVULATION

36-48 hours

PRE-OVULATION

10-50 years

BIRTH



# OOGENESIS

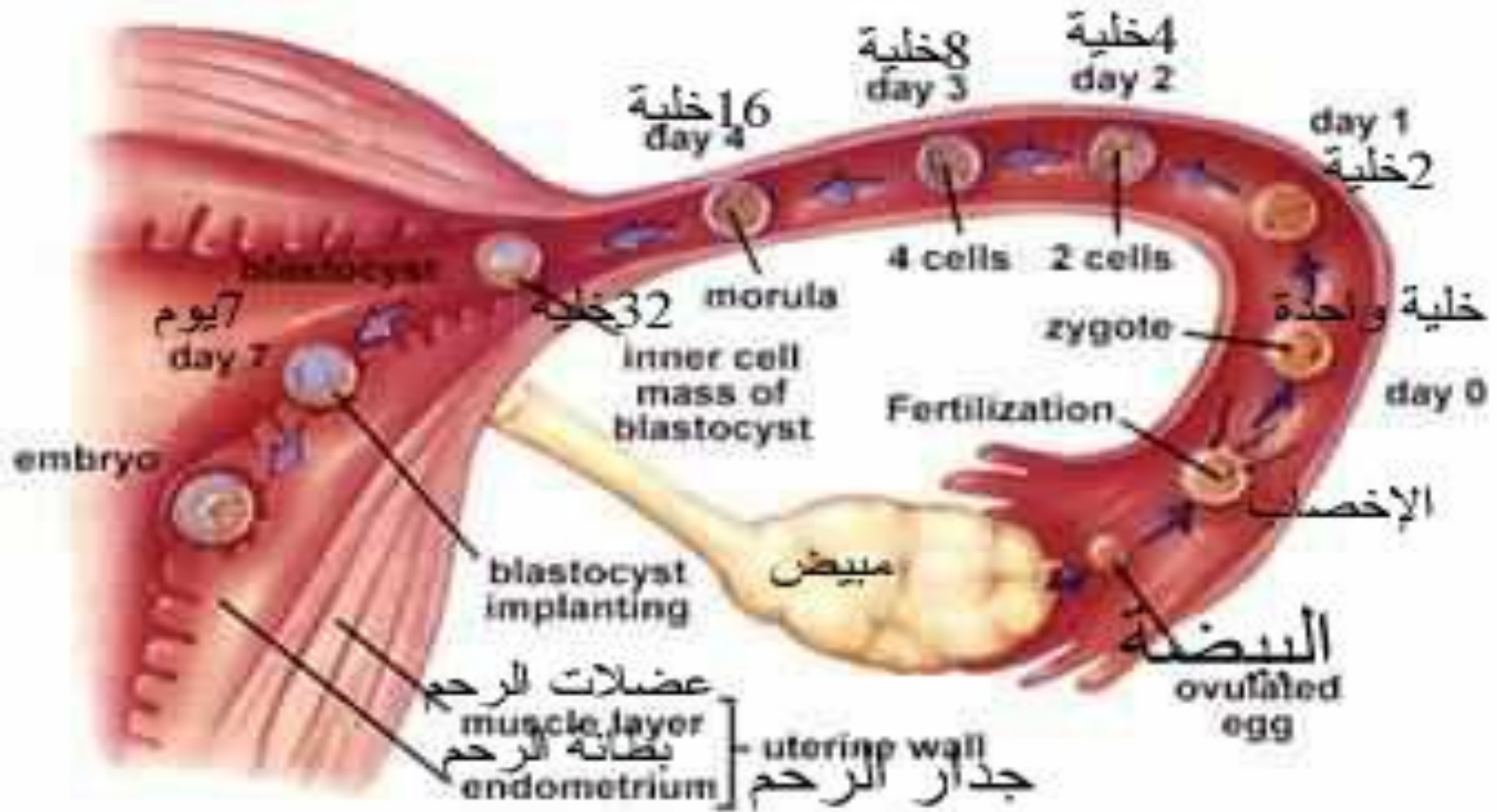
# Fertilization

- Sperm maturation occurs during passage in epididymis with seminal plasma from epididymis, seminal vesicle and prostate
- Ejaculated in vagina reach cervix within seconds by its own motility, helped by cervical mucus (stored 3-5 days)
- Reach tubes in 30-40min. by its own motility + tubal + uterine contractions
- Capacitation (2-6h)

# Fertilization(cont.)

- Capacitation
- It is the process after which the sperm become able to penetrate the zona pellucida that surround the ovum....mainly due to cervical and tubal secretions and it is due to:
  - A-increase in the DNA in nucleus
  - B-increase permeability of acrozone with more hyaluronidase
- \*ovum is released covered by zona pellucida and corona radiata,picked-up by fimbriated end of tube to meet thousands of sperms in the lateral part of tube where only one sperm penetrate the zona pellucida...zona reaction: change in electrical potential across the membrane prevent other sperms from penetrating the ovum

# Fertilization



# Implantation

- Start between day 5 to 8 and is completed by day 10
- Occurs in posterior surface of uterine wall in 2/3 and in anterior surface in 1/3 of cases
- During implantation trophoblast become differentiated into 2 layers (outer syncytiotrophoblast + inner cytotrophoblast, Langhans's layer)
- Result in dividing the decidua into 3 parts (basalis, capsularis, Parietals..vera)

# Decidua

- The endometrium during pregnancy and is so called because it casts after parturition, Composed of :
  - superficial compact layer
  - Intermediate spongy layer
  - Thin basal layer
- N.B separation of placenta occurs through the spongy layer

# Decidua(cont.)

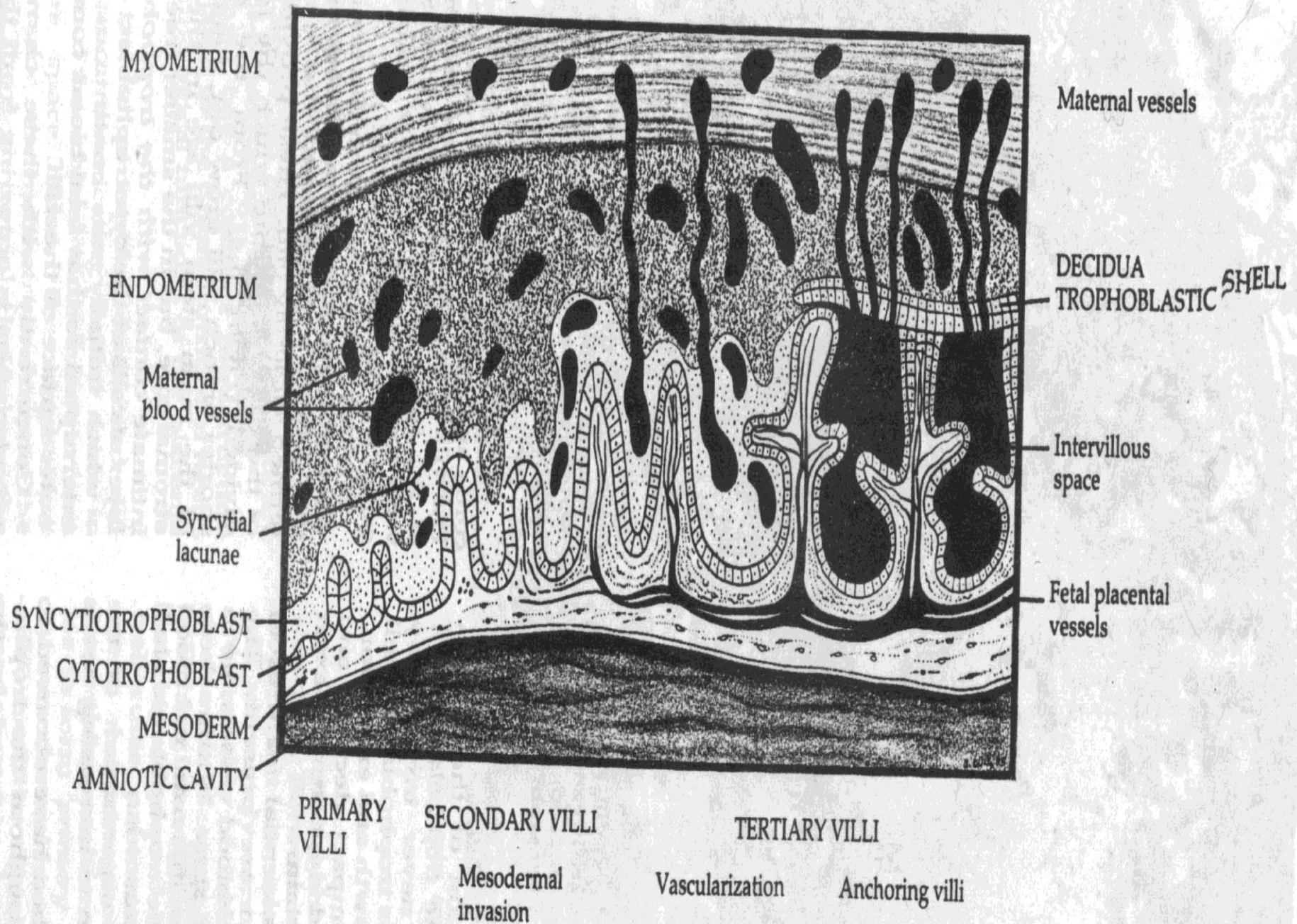
- After implantation become divided into 3 parts:
- Basalis opposite the implanted ovum
- Capsularis covering the ovum
- Parietalis(vera) lining the rest of uterine cavity (at 12 wk, decidua capsularis become fused with decidua parietalis)
- Its functions:
- 1-Site of implantation 2-resist invasion by trophoblast 3-nourish the early zygote by glycogen and lipid 4-forms part of placenta

# Chorion

- It is the trophoblastic layer with a mesodermal layer i.e. syncytiotrophoblast+cytotrophoblast+mesoderm. covering the ovum and at 12 wks it is divided into:
- Chorion frondosum: with decidua basalis forms the placenta
- Chorion laeve: opposite the decidua parietals, become thin and form outer layer of fetal membranes

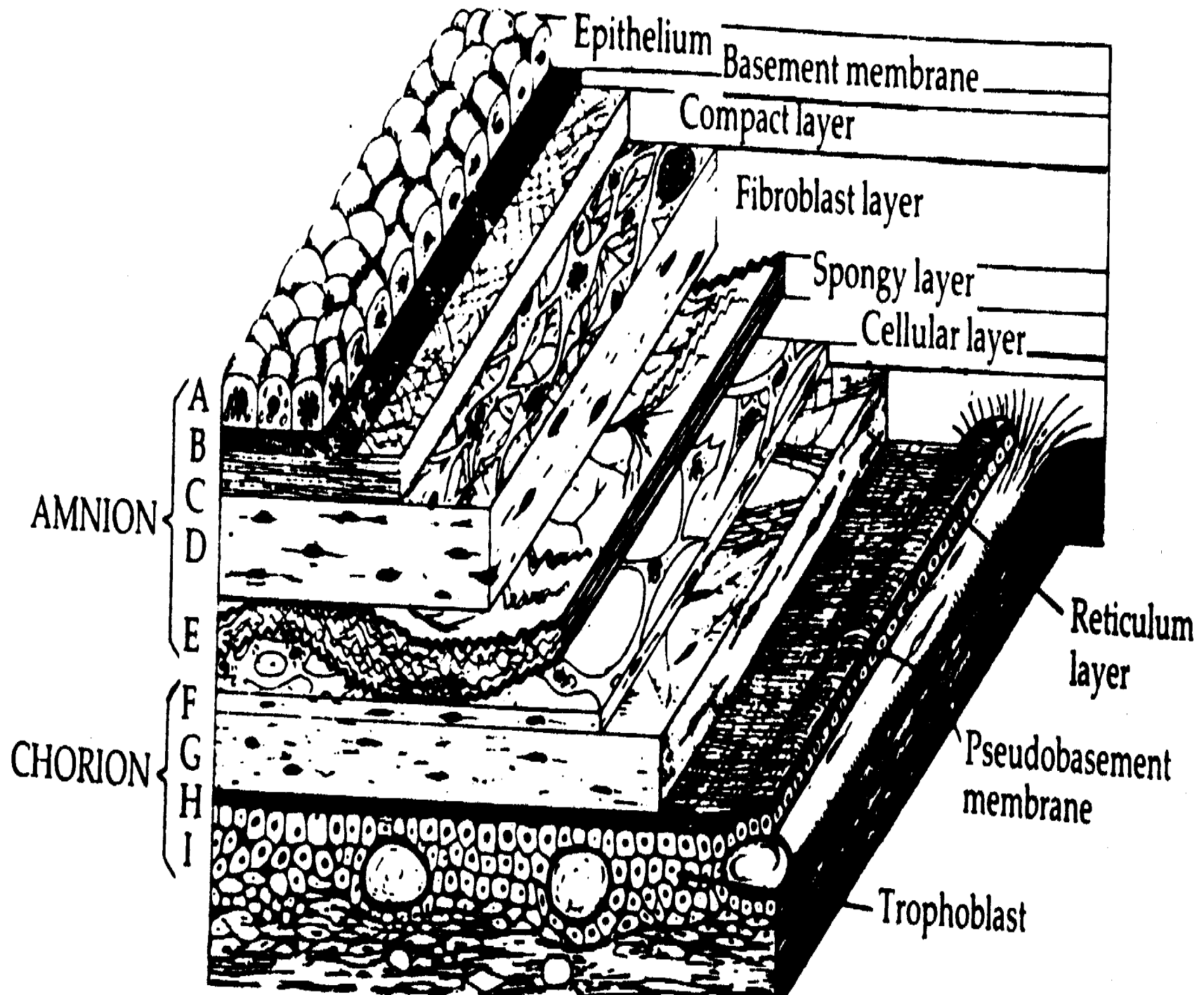
# Villi

- Primary villi trophoblastic layers i.e. syncytiotrophoblast+Langhans layer
- Secondary villi: 1ry villus+mesoderm
- Tertiary villi: 2ry villus+fetal B.V
- Anchoring villi..that reach to decidua basalis
- Absorbing villi..that hang freely in the intervillous space



# Fetal Membranes

- Chorion(from chorion laeve) forms the outer layer adherent to uterine wall
  - 1-cellular layer 2-dense reticulum
  - 3-pseudomembrane
  - 4-outer trophoblast
- Amnion (from fetal ectoderm) forms the inner layer
  - 1-cellular layer 2-basement membrane 3-compact layer 4-fibroblast layer 5-outer spongy layer (adherent to cellular layer of chorion)



# Abnormalities of membranes

- Color: Green color
- 1-Meconium staining 2-Old blood due to early bleeding 3-Infection (myeloperoxidase in Leukocytes)
- Malodorous: possibly infection
- Fecal odor \*Fusibacterium \*Bactroids
- Sweet odor \*Clostridium \*listeria

# Amniotic Fluid

- Clear with alkaline pH 7.2
- About 400ml in midpregnancy, 1000ml at 36weeks then decrease
- Composed of \*80-90%water carbohydrate –protein –lipids –hormones –minerals –vernix caseosa,lanugo hair, desquamated epithelium
- Every hour 500 ml. is replaced
- Abnormalities \*polyhydramnios (>2000ml)\*oligohydramnios(<500ml)

# AF

- Fetal origin -epithelium of amnion
- -fetal circulation –fetal urination
- Maternal origin \*transudation from maternal circulation
- Absorbed through membranes and swallowed by fetus
- Functions :pregnancy–protection –allow movement –keep temp. –nutrition –excretion Labor: bag of forewater help dilates cervix -antiseptic for birth canal

# Umbilical Artery



- Formed from mesoderm(Wharton's jelly) of connecting stalk, contains one vein and two a.a,remnants of YS.
- Length 40-70 average 55cm
- Diameter 2-2.5cm
- Insertion: \*Eccentric 70% \*Central 30%

# Abnormalities of UC

- Insertion
  - \*marginal
  - \*velamentous
- Length
  - \*long > 100cm
  - \*Short < 40cm
- Single artery
- Diameter
  - \*thin < 2cm
  - \*edema



# Velamentous insertion

- Cord is inserted in the membranes and connected to placenta with blood vessels. It could lead to vasa praevia if blood vessels pass in front of cervix....APH
- Thrombosis or laceration...fetal death
- Associated with –advanced maternal age –DM –Malformation –single artery

# Velamentous insertion of cord



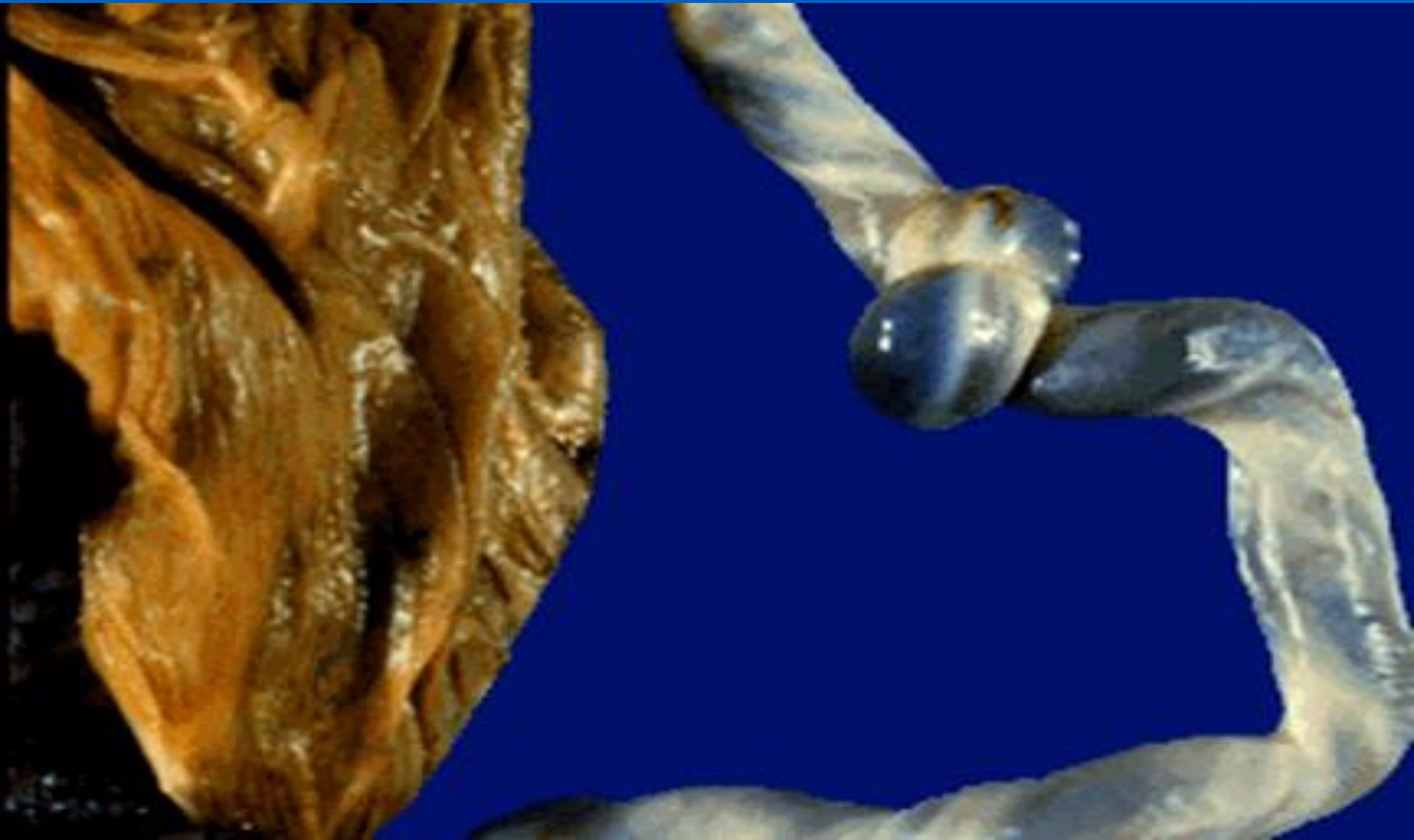
# Single umbilical artery may lead to torsion



# Abnormally long UC

- If length >100cm
- \*Fetal hyperactivity
- \*Risk of entanglement
- \*Risk of knot
- \*Risk of presentation and prolapse
- \*Risk of torsion and thrombosis

# True Knot of cord



# Entanglement (cord around neck)



# Short cord

- If cord <40cm
- \*Decreased fetal activity
- \*breech and other Malpresentation
- \*abruption
- \*Delayed descent in 2<sup>nd</sup> stage (prolonged labor)
- \*Inversion of uterus
- \*decrease I.Q, Down syndrome, anomalies