

Embryology Mnemonics

Compiled by→ Ussama Maqbool

2nd, 3rd and 4th weeks of development:

- Week 2 : Bilaminar germ disc
- Week 3 : Trilaminar germ disc
- Week 4 : Appearance of 4 limbs

Major Neural Crest Derivatives:

"GAMES"

- Glial cells of peripheral ganglia
- Arachnoid and Pia Sheath
- Melanocytes
- Enteric ganglia
- Schwann cells

Neuroectoderm derivatives

- Neurons
- Neuroglia
- Neurohypophysis
- pineal gland

Foregut derivatives

"Little Embryo People Do Like Swallowing, Producing Gas"

- Lungs
- Esophagus
- Pancreas
- Duodenum (proximal)
- Liver
- Stomach
- Pancreas
- Gall bladder

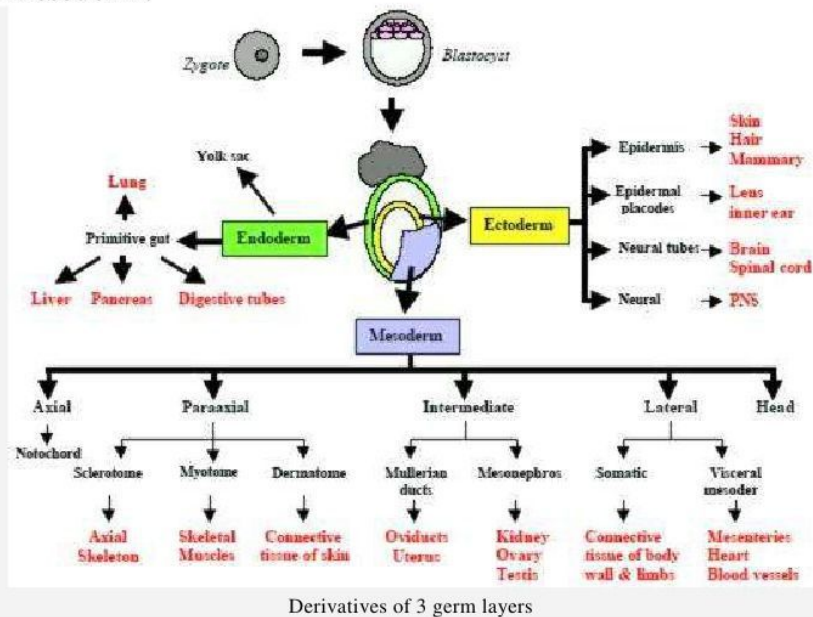
Occurrence of Teratogenesis

Teratogenesis

Between Third and Eighth weeks of gestation.

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Derivatives of Mesoderm:



“MESODERM”

- Mesothelium (peritoneal, pleural, pericardial)/ Muscle (striated, smooth, cardiac)
- Embryologic Spleen/ Soft tissue/ Serous linings/ Sarcoma/ Somite
- Osseous tissue/ Outer layer of suprarenal gland (cortex)/ Ovaries
- Dura/ Ducts of genitalia
- Endothelium
- Renal Microglia
- Mesenchyme/ Male gonad

Branchial apparatus:

“CAP covers from outside to inside.”

- C for Clefts : derived from ectoderm
- A for Arches : derived from mesoderm and neural crest
- P for Pouches : derived from endoderm

Chromosomal disorders:

- Edward syndrome : election age-ch-18
- Down syndrome : drinking age-ch-21
- Patau syndrome : puberty age-ch-13

Fetal Hemopoiesis (for Physiology):

“Young Liver Synthesizes Blood”

- Y : Yolk Sac (from 3 weeks)
- L : Liver (from 3 months)

- S : Spleen (from 3 months)
- B : Bone marrow (5 month onwards)

After birth hemopoiesis occurs only in bone marrow except in case of emergency when bone marrow falls.

Fetal alcohol syndrome (FAS):

"FAS"

- F : Facial hypoplasia and Forebrain malformation
- A : Attention deficit disorder and Altered joints
- S : Short stature, Septal defects and Small I.Q

Neural Crest Derivatives

"4 Gang MEN wore CAP"

A. 4 Gang (4 ganglia)

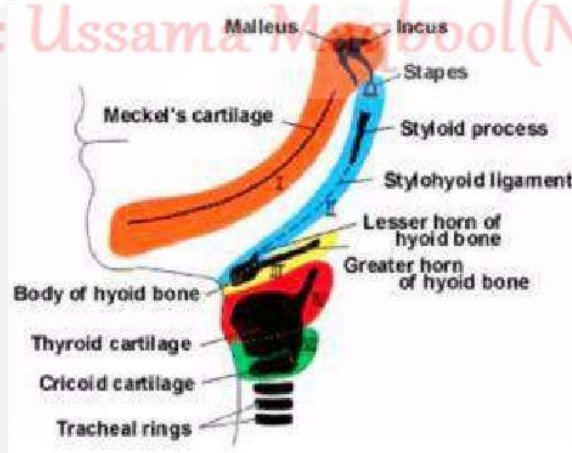
- Dorsal root ganglia of spinal nerves
- Ganglia of V, VII, IX and X cranial nerves
- Sympathetic & parasympathetic ganglia (autonomic ganglia)
- Ganglion cell layer of retina

B. MEN

- Melanoblast of the skin
- Enamel of teeth
- Neurilemma (Schwann cells)

C. CAP

- Chromaffin cells and Cranio-facial skeleton
- Arachnoid and Pia Maters



Derivatives of branchial arches

First Branchial Arch:

"IMPACTS"

Most of the aspects associated with the first arch begin with the letter 'M' and the rest with I, P, A, C, T or S.

- Name : Mandibular arch.
- Muscles :
 - Muscles of Mastication (Masseter, Temporalis, Medial & Lateral Pterygoids)
 - Mylohyoid
 - Anterior belly of Digastric
 - Tensor tympani and Tensor palatini
- Cartilage : Meckel's cartilage
 - Malleus & Incus, Sphenomandibular ligament & Anterior ligament of Malleus
- Innervation : Mandibular nerve, Chorda tympani

Cartilage derivatives of 2nd branchial arch:

5 "S"

- Stapes
- Styloid process
- Stylohyoid ligament
- Smaller (lesser) cornu of hyoid
- Superior part of body of hyoid

Derivatives of Pharyngeal Pouches:

"1A, 2P, 3 TIP, 4 SPUB"

- 1A (1st Pharyngeal Pouch – Auditory)
 - Epithelial lining of Auditory tube, middle ear cavity and mastoid antrum
- 2P (2nd Pharyngeal Pouch – Palatine)
 - Epithelial lining of crypts of Palatine tonsil
- 3 TIP (3rd Pharyngeal Pouch – Thymus and Inferior Parathyroid gland)
 - Thymus and Inferior Parathyroid gland
- 4 SPUB (4th Pharyngeal Pouch – Superior Parathyroid gland and Ultimobranchial Body)
 - Superior Parathyroid gland and Ultimobranchial Body

Nerves:

"March 5, 7910"

- 1 : V3 (March for 3 and 5 for V)
- 2 : VII (7)
- 3 : IX (9)
- 4 & 6 : X (10)

Mitosis: events at 4 stages · Prophase, Metaphase, Anaphase, Telophase:

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Prophase: Chromosomes and spindles are **Produced**.

Metaphase: chromosomes **MetAlign** themselves.

Anaphase: [**Ana**] divorced or separated.

Telophase: **Tell-O'**Brien his daughter cells are ready.

Woffian duct (mesonephric duct) derivatives. Gardener's

SEED:

· Female:

Gartner's duct, cyst

· Male:

Seminal vesicles

Epididymis

Ejaculatory duct

Ductus deferens

Potter syndrome: features POTTER:

Pulmonary hypoplasia

Oligohydrominios

Twisted skin (wrinkly skin)

Twisted face (Potter facies)

Extremities defects

Renal agenesis (bilateral)

Fetal alcohol syndrome (FAS): features FAS:

Facial hypoplasia/ Forebrain malformation

Attention deficit disorder/ Altered joints

Short stature/ Septal defects/ Small I.Q

Tetrology of Fallot PROVe:

Pulmonary stenosis

Right ventricular hypertrophy

Overriding aorta

Ventricular septal defect

Neuroectoderm derivatives Neuroectoderm gives rise to:

Neurons

Neuroglia

Neurohypophysis

pineal (pineal) gland

Foregut derivatives "Little Embryo People Do Like Swallowing, Producing Gas":

Lungs

Esophagus

Pancreas

Duodenum (proximal)

Liver

Stomach

Pancreas

Gall bladder

Heart: primitive heart chambers in fetal heart "The Broken Vein Always Stenoses, But Veins Are Smooth":

· The order of the compartments is:

runcus, bulbus

Primitive Ventricle

Primitive Atrium

Sinus venosus

· The connections are:

Bulbotruncal junction **Ventriculobulbar foramen**

Atrioventricular canal

Sinuatrial junction

Tetralogy of Fallot "Problems Of Small Hearts":

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Pulmonary stenosis
Overriding aorta
Ventricular Septal defect
Hypertrophy of right ventricle

Weeks 2, 3, 4 of development: an event for each Week Two:

Bilaminar germ disc.

Week **Three**: **Trilaminar** germ disc.

Week **Four**: **Four**limbs appear.

Lung development phases "Every Premature Child

Takes Air":

Embryonic period

Pseudoglandular period

Canalicular period

Terminal sac period

Alveolar period

Branchial arch giving rise to aorta "Aor- from Four":

Aorta is from fourth arch.

Placenta-crossing substances "WANT My Hot

Dog":

Wastes

Antibodies

Nutrients

Teratogens

Microorganisms

Hormones/ HIV

Drugs

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Cranial and spinal neural crest: major derivatives GAMES:

Glial cells (of peripheral ganglia)

Arachnoid (and pia)

Melanocytes

Enteric ganglia

Schwann cells

Tetralogy of Fallot "Don't DROP the baby":

Defect (VSD)

Right ventricular hypertrophy

Overriding aorta

Pulmonary stenosis

Mesoderm components MESODERM:

Mesothelium (peritoneal, pleural, pericardial)/ Muscle (striated, smooth, cardiac)

Embryologic

Spleen/ Soft tissue/ Serous linings/ Sarcoma/ Somite

Osseous tissue/ Outer layer of suprarenal gland (cortex)/ Ovaries

Dura/ Ducts of genitalia

Endothelium

Renal

Microglia/ Mesenchyme/ Male gonad

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Tetralogy of Fallot "IHOP-International House of Pancakes":

Interventricular septal defect

Hypotrophy of right ventricle

Overriding aorta

Pulmonary stenosis

Teratogenesis: when it occurs Teratogenesis is most likely during organogenesis--between the:

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Third and
Eighth weeks of gestation.

Vitelline duct: closure time Vitelline duct normally
closes around week **VI** of intrauterine life.

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Week **Two**: **B**ilaminar germ disc.
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