

# *Tutor guide*

**M1 first term 2024-2025**

**- Contents:**

- 1-Guide lines (why P.B.L. “Problem Based Learning”) added to integrated system in October 6 university faculty of medicine (what the student & tutor will do this term) , (modules in this term & their general objectives)
- 2-Schedule for lectures , practicals , cases ( small group teaching) , skill lab , & exams
- 3-Rubrics for grading assignments and presentations
- 4-Portfolio template ( to be completed by each student and tutors and department members put the marks and be submitted to tutors by end of each module )
- 5-Cases ( with objectives in tutor guide and without objectives in student guide )

**- PBL Philosophy:**

In a world where available information is growing exponentially, we believe that the most important thing a student needs to know is how to learn. So the main learning goals of the PBL are a framework for looking at concepts, skills, and abilities and help guide the creation of personalized student curriculum. PBL offers unique environments where students can flourish as individuals within a community of learners.

**- PBL Process:**

The core of the PBL process is the tutorials that will be held once weekly beside the practical sessions and the interactive lectures. In each tutorial there will be a case scenario that is delivered to the students, where they collaborate together through the seven jumps process to point out the possible problems present in the case and to find out the intended learning objectives need to be known through this case. In the second tutorial, they will discuss the objectives of the case after self study, and a new case will be delivered. In PBL process the role for lectures aim at clarification of complicated areas of information or to integrate different areas of information. Practical sessions and clinical skill lab are included as educational activities in BPL. They act as tools for the students to gain the needed psychomotor skills and to attain the professional attitude and behavior.

**- Student role:**

The student is the center of the learning process in PBL. **Students will depend on themselves in finding out the learning objectives by brain storming in the case study session. Then they will go home and study and search in the texts for the information of the objectives they got. Then the following session they should try to present the information they gazed and summarized to their students in an easy palatable way.** In PBL the students have to work hard, prepare themselves well for every tutorial group meeting, collaborate with their colleagues and practice team work. They also will have their reflection about the process, their colleagues and the tutor.

**- Tutors role:**

- The tutor will work as a facilitator more than traditional teacher who delivers all the information to the students. Tutors role is to stimulate and motivate the students to learn and to search for the information and knowledge. During the case they will guide the students and redirect them towards the intended learning objectives. The tutors share in the assessment process. Moreover, the tutor together with the students has the responsibility of setting the roles of the tutorial session.

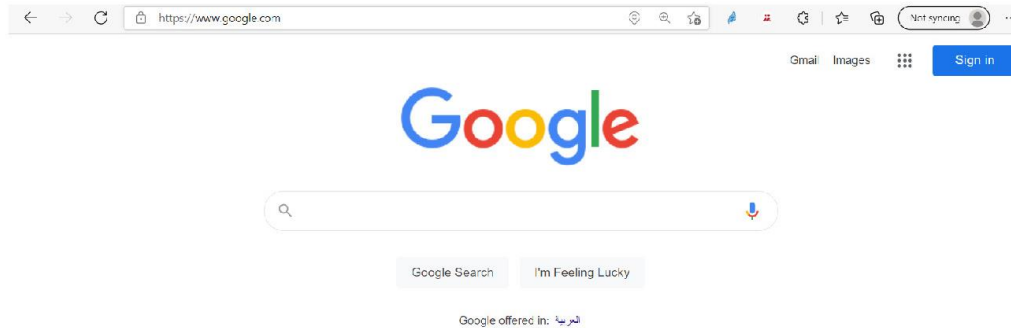
- The tutor will receive guide information for the objectives in each case from the departments at least one week before the case is to be discussed, he should read them and then in the discussion of the case he should see if the students had fulfilled all the needed items so as to approve their work or they need to search more for certain items and get them so as to complete their work completely or they got more or un needed items they should discard them. By the end of the cases of the module students will have their hand out covering all items needed in the objectives they searched for
- All staff members should have their official mails done by the beginning of the academic year so as good communication may be applicable and to facilitate uploading of their lectures every Wednesday of each week
- Concerning the module (BOS 101) which is the beginning module for M1 the academic year 2022-2023.
- In each session one of the students will be the reader (the one who reads the case) and another one will be the writer (the one who writes the objectives on the board after brain storming of the students with the tutor and collect them after that)
- In session ( 1 ) ( week 1)
  - One case will be red by the students
  - They make brain storming with each other and with the tutor to get the objectives the case is talking about. They will go home to search for them and make presentation about them the coming session.
  - Weeks for reading of the cases and discussion of the objectives are written above each case.
  - The presentation have certain rubrics the tutor try that the students stick more and more to them each presentation then at the last presentation of the module they will have certain mark among their portfolio total mark about:
    - The presentation they showed along the module and their share in the discussions and preparation of the work needed (see professional behavior sheet included) (the mark is given by the tutor)
  - After they finish the presentation in each session they will read the following case and brain storm to get the objectives that they will go home to prepare them as presentation in the coming case session and so on all the sessions
  - If the case is long its presentation by the students may take two weeks not one week to ensure that the students presented the objectives in the case in a good way
- All students are to make their Emails in the first week try to login to thr LMS so as to be able to reach the following:
  - Lectures
  - Videos
  - Presentation
  - On line exams formative questions

**- Scoring Rubric for Presentations:**

Category	Scoring Criteria	Total Points	Score
<b>Organization (15 %)</b>	Were the main ideas presented in a clear manner?	5	
	Information is presented in a logical sequence.	5	
	Presentation appropriately cites requisite number of references.	5	
<b>Content (45 %)</b>	- The Introduction is attention-getting, - It lays out the problem well, - It establishes a framework for the rest of the presentation.	5	
	Technical terms are well-defined in language that is appropriate for the target audience.	5	
	The Presentation contains accurate information.	10	
	The material included is relevant to the overall message/purpose.	10	
	Appropriate amount of material is prepared, and the points made reflect well their relative importance.	10	
	There is an obvious conclusion summarizing the presentation.	5	
<b>Presentation (40 %)</b>	Speaker maintains good eye contact with the audience and is appropriately animated (e.g., gestures, moving around, etc.).	5	
	Speaker uses a clear, audible voice.	5	
	Delivery is poised, controlled, and smooth.	5	
	Good language skills and pronunciation are used.	5	
	Visual aids are well prepared, informative, effective, and not distracting.	5	
	Length of presentation is within the assigned time limits.	5	
	Information was well communicated.	10	
<b>Score %</b>	<b>Total Points</b>	<b>100%</b>	

# Steps to register on the Moodle e-learning website for Faculty of Medicine

1. Open any browser e.g. Chrome, Firefox, Edge, Safari .....

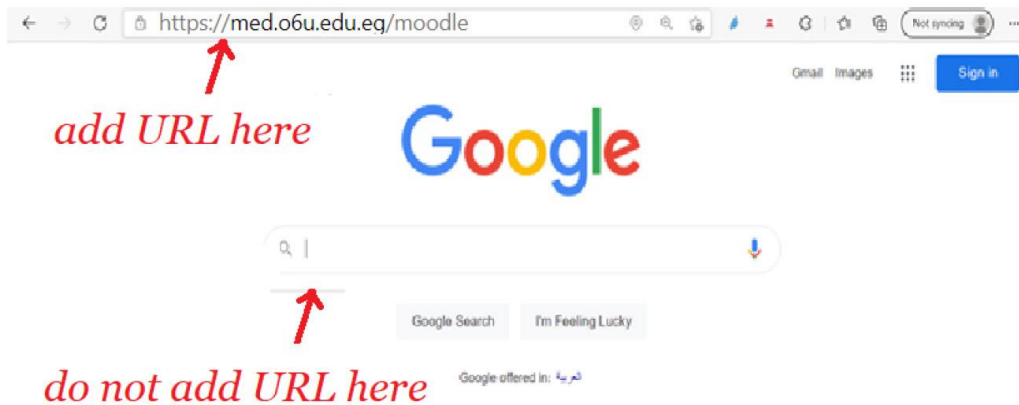


2. Then copy & paste this address in the URL box

<https://med.o6u.edu.eg/moodle>

N.B.

- It is https & not http
- There is no www in the address



### 3. Press "Enter" Key

o6u-med English (en) You are not logged in. (Log in)



الهيكل الإداري لجامعة 6 أكتوبر- كلية الطب



رئيس مجلس الأمناء الأستاذ الدكتور أحمد زكي بدر

### 4. Click on "log in" in the upper right corner of the screen.



Username

Password

Remember username

**Log in**

Forgotten your username or password?

Cookies must be enabled in your browser ?

Some courses may allow guest access

Log in as a guest

5. Write your ID number twice: in the “Username” & in the “Password” ..... here is an example:



20022792

.....

Remember username

Log in

Forgotten your username or password?

Cookies must be enabled in your browser ?

Some courses may allow guest access

Log in as a guest

6. Then click on “Log in” below. You will be asked to change your Password:

You must change your password to proceed. ×

Change password

Username 20022792

The password must have at least 8 characters, at least 1 digit(s), at least 1 lower case letter(s), at least 1 upper case letter(s), at least 1 non-alphanumeric character(s) such as as \*, -, or #

Current password ⓘ

New password ⓘ

New password (again) ⓘ

Save changes

There are required fields in this form marked ⓘ .


The new password must have at least 8 characters, at least 1 digit(s), at least 1 lower case letter(s), at least 1 upper case letter(s), at least 1 non-alphanumeric character(s) such as as \*, -, or #

**Very Important: DO NOT FORGET THE NEW PASSWORD**

## How to enroll yourself in a Module?

Some modules need an “enrolment key” to enter it for the first time. Ask you teacher for this key.

### Enrolment options

 Pediatrics-5

Teacher: Manar Aref  
Teacher: Eman Sharaf

▼ Self enrolment (Student)

Enrolment key

[Enrol me](#)

**Enrolment key is ( o6u)**



# Professional Behavior of student in the case checklist

Students Name: .....

Date: .....

End of module (Summative): .....

Module title: .....

Student's Signature :.....

Tutor's Name:.....

Criteria	Scale:					Comments
	1 and 2 is unsatisfactory, 3, 4 and 5 is satisfactory performance					

**Preparation:**

Is well prepared with relevant information, uses a variety of references and summarizes key points

	1	2	3	4	5
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**Critical thinking:**

Identifies problem, analyzes problem, suggests possible reasons for the problem, helps group to formulate learning objectives

	1	2	3	4	5
--	---	---	---	---	---

**Participation:**

Participates actively, talks on turn and listens attentively to others

	1	2	3	4	5
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**Communication Skill & Group Skills:**

Respects tutor and colleagues, communicates well uses appropriate language, accepts feedback and responds appropriately.

	1	2	3	4	5
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Contributes to group learning, shares information with others, demonstrates sensitivity to views and feeling of others, takes on assigned tasks willingly

**Presentation skills:**

Presents the information relevant to the learning objective of the case, explains clearly the reasoning process with regard to solving the problem

	1	2	3	4	5
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**SATISFACTORY**

**UNSATISFACTORY**

**-The students portfolio (October 6 university - faculty of medicine - 2024 - 2025):**

**Portfolio :**

It is a collection of student work , reflections , and educational experience done and arranged by the student for documentation and assessment.

**Purpose of portfolio :**

It is formed to monitor the student progress ,, assess the student achievement , and determine the student grades.

**Goals**

- Show learning progress over time
- Provide greater motivation for students
- Increase self assessment skills
- Encourage reflective learning
- Increase tutor student collaboration

**Module :**

**Student name :**

**ID:**

**Level:**

**Academic year :**

**First term / Second term :**

Task	Monitored by	Signature	Mark
<b>-CV of student</b>  <b>-Attendance</b>  <b>-List of Cases taken or seen in the module</b>  <b>-Objectives detected by brain storming</b>  <b>-Presentation in front of colleagues against rubrics</b>  <b>-your reflection concerning the sessions, cases , objectives , and presentation</b>	<b>Tutor</b>		<b>20%</b>

-Topics of Lectures taken in the module	-Department member		10%
-topics of practicals and laboratories taken in the module	-Department member		
-Skills achieved n this module	-professor in the skill lab		
-Number of formative exams done	-professor in the lecture		
-Your reflection concerning the lectures , practicals , skill labs , and formative exams	-Department member		
Task needed by department ..... or assignments or research work or video making	-Department member		Mark for all departments sharing in module 25%
Task needed by department ..... or assignments or research work or video making	-Department member		Mark for all departments sharing in module 25%
Task needed by department ..... or assignments or research work or video making	-Department member		Mark for all departments sharing in module 25%
Points of strength you had in this module ( <i>what you need to do using what you knew or what could have been better in your work after your knowledge )</i>	Tutor		10%
Points of weakness in this module and your sight to correct them	Tutor		5%
Describe your study day	Tutor		10%

<i>(what you tried to learn , how your learning influenced your practice , the most important thing you learnt in this module)</i>			
Meeting with staff member <i>(what was the objective and what was the result )</i>	Staff member		5%
Have you visited Alex (the talking patient robot , and SECTRA table ) <i>(If YES please say how was your journey and if NO please say why )</i>	Tutor		3%
Describe your group work with your colleagues <i>(Team Based Learning )</i>	Tutor		10%
Any activities you have done	Tutor		2%

Modules in this term :

Code	Course Title	Credit Hours	Marks				
			Mod-work	Mid-Mod	End-Module	Pract & Clin	Tot
IBS 101	Introduction to Body Structure	5	12	25	50	38	125
IBF 102	Introduction to Body Function	4	10	20	40	30	100
IHI 103	Introduction to Heamato-Immunology	5	12	25	50	38	125
IMB 104	Introduction to Molecular Biology	3	7	15	30	23	75
SKL 1	Skills 1	1	-	-	-	25	25
PRF 1	Professionalism 1	1	-	-	Pass / Fail	-	-
ELE 1	Elective 1	1	-	-	Pass / Fail	-	-
<b>Total</b>		<b>20</b>	<b>41</b>	<b>85</b>	<b>170</b>	<b>154</b>	<b>450</b>

























## Cases for the first year students (first term 2024-2025)

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### Case 1: Bone growth

Ali, a 14 year old boy, attended the orthopedic clinic as his parents noticed an unequal length of both lower limbs. Which was more noticeable during the last few months. By discussing his history, The parents confirmed that they didn't notice this variation except in the last few months. They gave a history of a fracture in the left leg two years earlier. They were advised to have an X-ray which showed a callus of bone tissue near the upper end of the left tibia indicating a healed fracture. The left leg was the shorter one.

1. Mention the type of ossification of long bones and their ossification centers. (Anatomy)
  - Membranous ossification: a connective tissue membrane will ossify into bone (e.g.: clavicle).
  - Cartilaginous ossification: a membrane will be transformed into cartilage model which will ossify into bone (e.g.: all bones of the limbs except clavicle).
  - Before birth, the shaft is transformed into bone, it begins by a primary center of ossification.
  - After birth, each end is transformed into bone, it begins by a secondary center of ossification.
2. Describe the structure of a growing long bone. (Anatomy)
  - During development of long bones, it is formed of a membranous model, which mostly changes to cartilage.
  - Before birth, the shaft is transformed into bone, it begins by a primary center of ossification. • After birth, each end is transformed into bone, it begins by a secondary center of ossification.
  - A disc of cartilage persists between the shaft and each end; it is called epiphyseal plate of cartilage.
  - The epiphyseal plate of cartilage adds new cells to the shaft, this will increase bone length.
  - The newly formed part of the shaft (near epiphyseal plate of cartilage) is called metaphysis.



- Later, the epiphyseal plate of cartilage ossifies, this will stop bone lengthening.
- Usually, the 2 epiphyseal plates of the same bone do not ossify at the same time. One (non-growing) end ossifies around the age of 19 years in males (17 years in females). The other (growing) end will ossify around the age of 21 years in males (19 years in females) with variations.
- The bone is covered by a periosteum. The periosteum adds new cells deep to it, causing an increase in bone width.
- The bone shows a cavity. This cavity is lined with endosteum and contains bone marrow, which is responsible for formation of blood cells.

3. Explain the discrepancy in the length of both limbs. (Anatomy)

- Due to fracture of the epiphyseal plate which is responsible for the increase of long bone length



Photo of a child with a limb length discrepancy due to growth plate injury.



**Case 2: Immotile cilia syndrome**

A 27-year-old woman arrived at the infertility clinic, claiming to have been unable to conceive for two years. She has a history of tubal pregnancy, recurrent chest infection and chronic sinusitis. The initial assessment of infertility revealed normal hormone levels and normal pelvic ultrasound findings, The doctor suspected there may be an underlying genetic disorder influencing cilia function. Immotile cilia syndrome is confirmed by genetic testing.

1- Describe the anatomy of the fallopian tube. (Anatomy)

- It is about 10 cm.
- It receives the ovum from the ovary, the ovum remains for 1 day for fertilization.
- If fertilization occurs, the cilia in the fallopian tube move the fertilized ovum to the uterus.
- Parts: Infundibulum: guiding the ova and showing fimbriae (finger like processes). Ampulla: dilated part. It is the site of fertilization. Isthmus: narrow part. Intrauterine part: narrowest part.

2- Explain how the above-mentioned syndrome can result in the case of infertility or tubal pregnancy. (Anatomy)

In women, reduced function of motile cilia lining the fallopian tubes may be the cause of reduced fertility due to impaired oocyte transport leading to increased risk of ectopic pregnancies.

3- Enumerate the types of cell apical modification with examples. (Histology)

### Apical Modifications

#### 1- Microvilli:

- Finger like projections from the cell Membrane.
- L.M: apical brush border.
- EM: have a core of actin filaments which maintain its shape & help shortening & elongation of microvilli.
- Site & function: Increase the apical surface area for absorption e.g., in small intestine

#### 2- Stereocilia: (solid= non- motile):

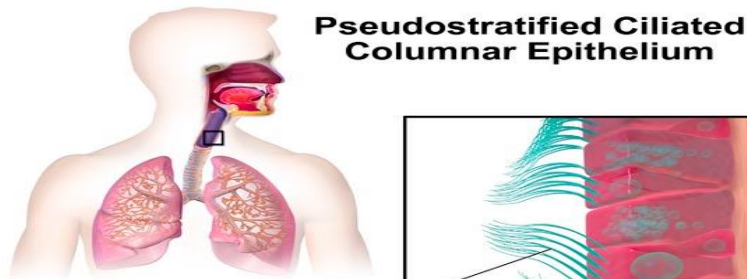
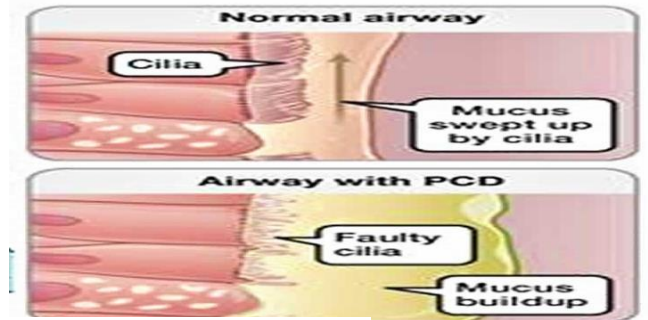
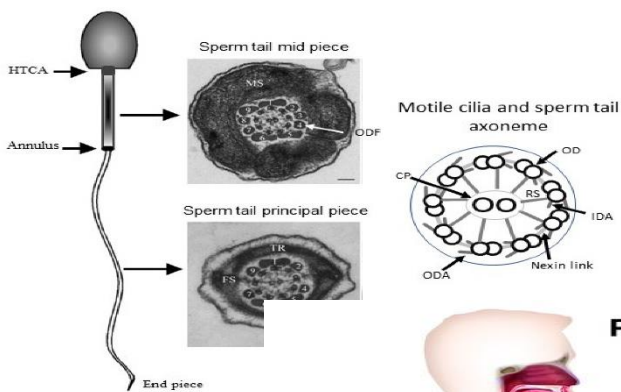
- Not true cilia but long microvilli.
- L.M: hairlike processes from the free surface of some cells.
- E.M: Have a core of actin filaments.
- Function & Site: help absorption e.g. epididymis.

#### 3- Cilia:

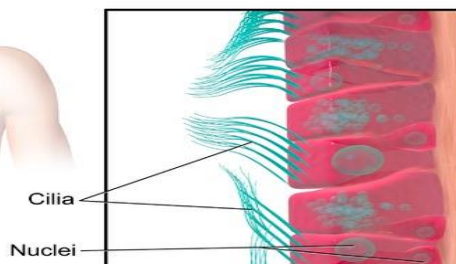
- L.M: hairlike processes which arise from the free surface of some cells.
- E.M: have a core of 20 microtubules arranged as 9 peripheral doublets & 2 central singlets covered with cell membrane.
- Function & sites: Their rhythmic beating propels fluids or particles in one direction e.g. trachea, bronchi & Fallopian tube.

4- **Flagella:** is an extra-long cilium that forms the tail of sperm & helps its movements.

4- In cases of male patients, how this syndrome affect fertility? **(Histology)**  
 Sperm flagella share similar axonemal structures with motile cilia, with mutations leading to sperm dysmotility or morphological abnormalities of sperm.

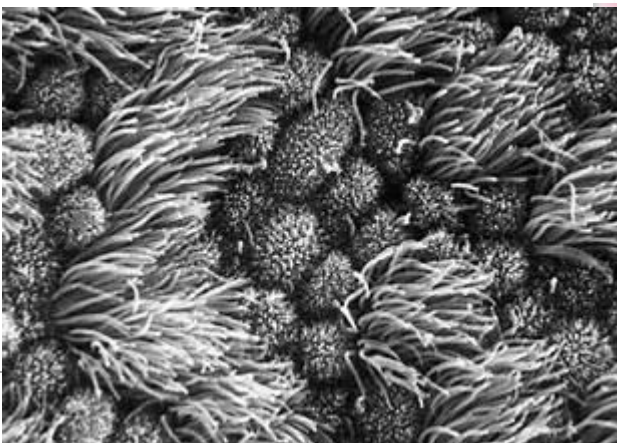


**Pseudostratified Ciliated Columnar Epithelium**



**Umbilical**

**Case 3:**



**cord abnormalities**

A 28-year-old woman, 34 weeks gestational age, presents to the prenatal clinic for routine ultrasound examination. The obstetrician noticed an umbilical cord localized thickening around the umbilical vein. However, healthy fetal heart sounds and normal blood flow within the umbilical cord assured him that there is nothing to worry about.

1- What is the name of this condition? (**Anatomy**)

**False umbilical cord knots due to localized collections of Wharton's jelly within the umbilical cord.**

2- Enumerate the contents of umbilical cord. (**Anatomy**)

**Contents:**

1) **Warton's jelly:** the EEM of the connecting stalk.

2) **Umbilical vessels:** a) Two (Rt & Lt) umbilical arteries: carries non oxygenated blood from the fetus to the placenta. b) Two (Rt & Lt) umbilical veins: the Rt rapidly disappears. The Lt vein carries oxygenated blood from the placenta to the fetus.

3) **Vitelline duct:** which connects the midgut to the definitive yolk sac. Later this duct disappears.

4) **Urachus** (distal part of allantois).

3- Mention the congenital anomalies of umbilical cord. (**Anatomy**)

**Anomalies of umbilical cord:**

1) **Very long cord:** may wind around the neck of the fetus causing hypoxia and may cause true knots.

2) **Very short cord:** may cause early separation of the placenta.

3) **Knots of the cord:**

4) **Abnormal attachment of the cord to the placenta** (battledore placenta and velamentous attachment of umbilical cord)

4- Describe in detail the type of connective tissue in the umbilical cord.

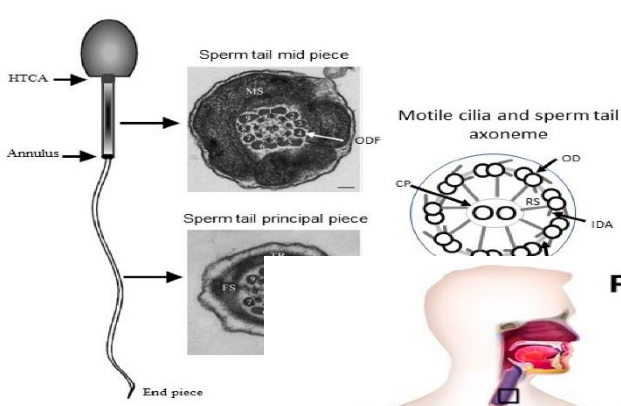
**(Histology)****➤ Type of C.T is Mucoïd connective tissue****▪ Structure: formed of**

○ Mesenchymal cells & fibroblasts that communicate with their processes.

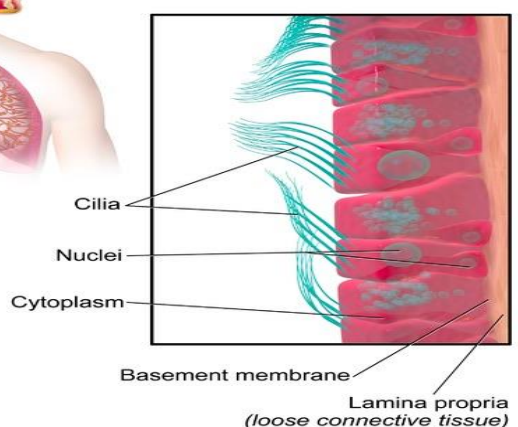
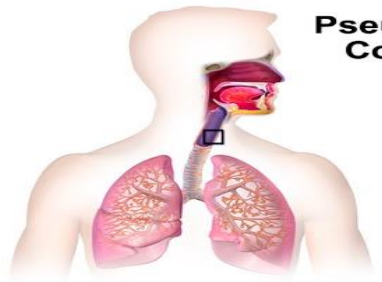
○ Jelly like ground substance huge in amount, rich in mucus, hyaluronic acid and glycoprotein called Wharton's jelly.

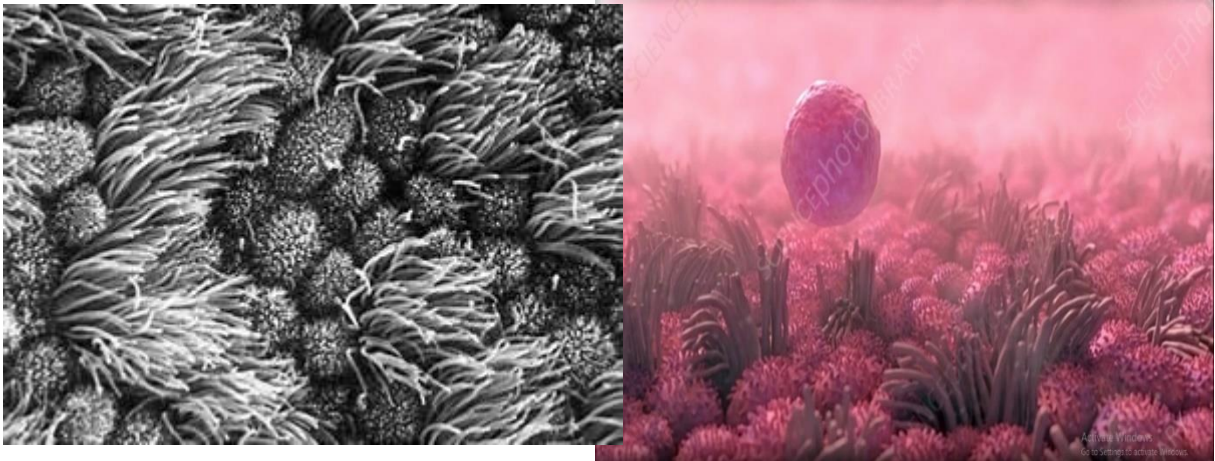
▪ **Other Sites:** • Pulp of growing tooth. • Vitreous humor of eye.

▪ **Function:** protects nearby structures from pressure.



**Pseudostratified Ciliated Columnar Epithelium**





Cilia within the fallopian tubes

### 3: Umbilical cord

### Case

### abnormalities

A 28-year-old woman, 34 weeks gestational age, presents to the prenatal clinic for routine ultrasound examination. The obstetrician noticed an umbilical cord localized thickening around the umbilical vein. However, healthy fetal heart sounds and normal blood flow within the umbilical cord assured him that there is nothing to worry about.

- 5- What is the name of this condition? (**Anatomy**)
  - Knots of umbilical cord
- 6- Enumerate the contents of umbilical cord. (**Anatomy**)
  - 5 structures forming the content of umbilical cord
- 7- Mention the congenital anomalies of umbilical cord. (**Anatomy**)
  - Abnormal length
  - Abnormal attachment
  - Interruption of blood flow within cord
- 8- Describe in detail the type of connective tissue in the umbilical cord. (**Histology**)

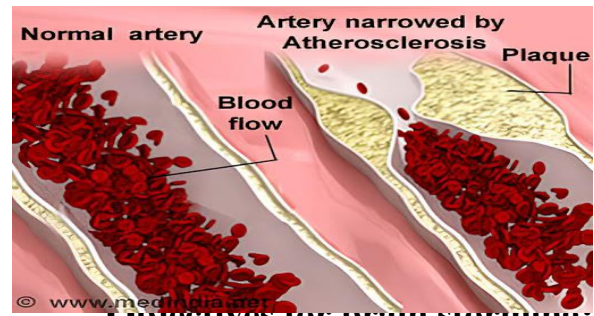
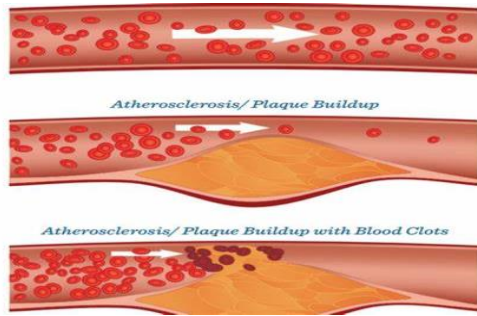


## Tutor guide

### 1-case 1:

A 57 years old, obese, heavy smoker male was admitted to the ER department suffering of severe chest pain on and off. By clinical examination the patient is hypertensive. The ER doctor carry out angiography which revealed narrowed coronary arteries, which is a common consequence for the risk factors of the patient (atherosclerosis).





**Objectives for brain storming:**

- 1) Mention the epithelial lining of large arteries and how it differs from other types of simple epithelium. (H) **Simple squamous epithelium**

a-Simple Epithelium

Definition:

It is formed of one layer of cells resting on basement membrane.

It is divided according to shape of cells into:

- Simple squamous epithelium 1-
- Simple cubical epithelium 2-
- Simple columnar epithelium 3-
- Simple columnar ciliated epithelium 4-
- Pseudo-stratified columnar epithelium 5-

POC	1-Simple squamous epithelium	2-Simple cubical	3-Simple columnar	4-Simple columnar ciliated
<b>Shape of cells</b>	<ul style="list-style-type: none"> <li>• Flat</li> <li>• Flat nucleus</li> </ul>	<ul style="list-style-type: none"> <li>• Cub like</li> <li>• Central rounded nucleus</li> </ul>	<ul style="list-style-type: none"> <li>-Tall cells</li> <li>-Basal oval nucleus</li> </ul>	<ul style="list-style-type: none"> <li>Tall cells carry cilia</li> <li>-Basal oval nucleus</li> </ul>
<b>Functions</b>	<ul style="list-style-type: none"> <li>• Smooth surface (easy movement)</li> <li>• Thin surface (gas &amp; fluid exchange)</li> </ul>	<ul style="list-style-type: none"> <li>• Secretion</li> <li>• Reabsorption</li> </ul>	<ul style="list-style-type: none"> <li>Secretion</li> <li>Absorption (Microvilli e.g., intestine)</li> </ul>	<ul style="list-style-type: none"> <li>Movement of particles or fluids over surface</li> </ul>
<b>Sites</b>	<ul style="list-style-type: none"> <li>• Mesothelium[pleura, pericardium &amp; peritoneum]</li> <li>• Endothelium[heart &amp; blood vessels]</li> <li>• Lung alveoli</li> <li>• Bowman's capsule of kidney</li> </ul>	<ul style="list-style-type: none"> <li>• Thyroid follicle</li> <li>• Small ducts of salivary g.</li> <li>• Renal convoluted tubules</li> </ul>	<ul style="list-style-type: none"> <li>-Stomach</li> <li>-Intestine</li> <li>-Goblet cell [secret mucous which accumulates in its apex]</li> </ul>	<ul style="list-style-type: none"> <li>-Lung bronchioles</li> <li>-Uterus</li> <li>-Oviduct</li> </ul>



2) Discuss the type of connective tissue in the wall of large arteries and mention the other different types.(H)

Types of Connective Tissue Proper in large arteries

Yellow elastic connective tissue

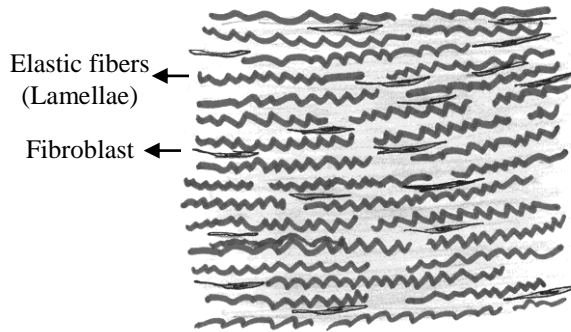
**i. Structure:** formed of connective tissue cells mainly fibroblasts and connective tissue fibres mainly elastic fibres so it appears yellow in fresh state and can be stained brown with orcein.

**ii. Sites:**

- Aorta and large vessels.
- Bronchi and bronchioles.
- Ligamentum nuchae and ligamentum flavum.

**iii. Function:** gives flexible support.

3) Demonstrate the difference between arteries and veins (A).



**Elastic C.T.**

➤ **The blood vessels**

The blood vessels include arteries, veins and *connections* between arteries and veins. A.

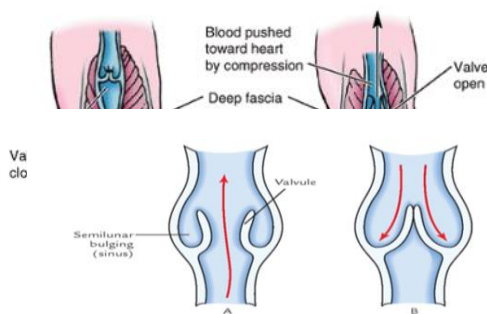
A - Arteries

- Arteries are elastic vessels that carry blood *away* from the heart.
- All arteries carry oxygenated blood *except the*: pulmonary artery which carries non-oxygenated blood.
  - Large arteries give rise to medium-sized arteries which give rise to smaller arteries and arterioles. The latter give rise to capillaries at the level of tissues.
- An artery is usually accompanied by a *single* vein. However, some arteries are accompanied by two small veins called *venae comitantes* which assist venous return against gravity as in the arm, forearm, and leg.
- Arteries tend to anastomose with each other especially around the large joints and in the hand

- and foot, to avoid effect of movements on the blood flow to regions *distal* to the joints
- Some arteries do not anastomose at all with adjacent arteries, and they are called *end* arteries like:
  - Central arteries suppling C.N.S
  - Central artery of the retina.
  - Coronary arteries of the heart.
  - Segmental arteries supplying the intestine.
  - Segmental arteries supplying lungs, kidneys, and spleen.
    - Some arteries run a *tortuous* course specially those supplying mobile organs.
  - Ophthalmic artery of the eyeball.
  - Facial artery.
  - Lingual artery.
  - Splenic artery.
  - Uterine artery.

**B- Veins**

- Veins are thin-walled vessels which carry blood *to* the heart.
- All veins carry non-oxygenated blood **except the** four pulmonary veins which carry oxygenated blood.
- Veins begin from the venous side of capillaries as venules which give rise to larger veins. (Called tributaries). Large veins in the limbs have numerous valves to help venous return against gravity.



**Valves inside the veins**



**Valves in the veins of L.L and Muscular pump**

4) Discuss different body circulations. (A)

➤ **Circulations of the blood**

**1- Systemic circulation**

- It is between the left ventricle and the whole body.
- The left ventricle pumps its oxygenated blood to the aorta which gives many arteries supplying the whole body. Venous blood returns from the body to the heart via :
  - Superior vena cava, drains upper half of the body.
  - Inferior vena cava, drains lower half of the body
  - Coronary venous sinus drains the heart itself.

**2. Pulmonary circulation**

It is between the right ventricle and lungs.

The right ventricle pumps its non-oxygenated blood to the pulmonary artery which carries it to the lungs.

Oxygenated blood returns from the lungs to the left atrium via the four pulmonary veins.

**3. Portal circulation**

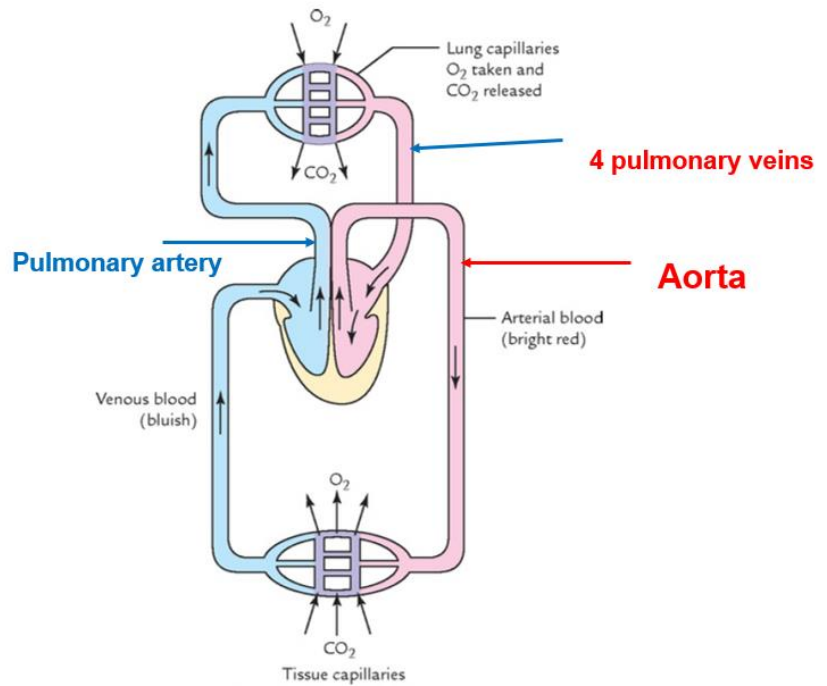
Portal circulation means that, blood comes from one set of capillaries and passes to a second set of capillaries. In other words, a portal vein begins like a vein and ends by dividing into branches like an artery.

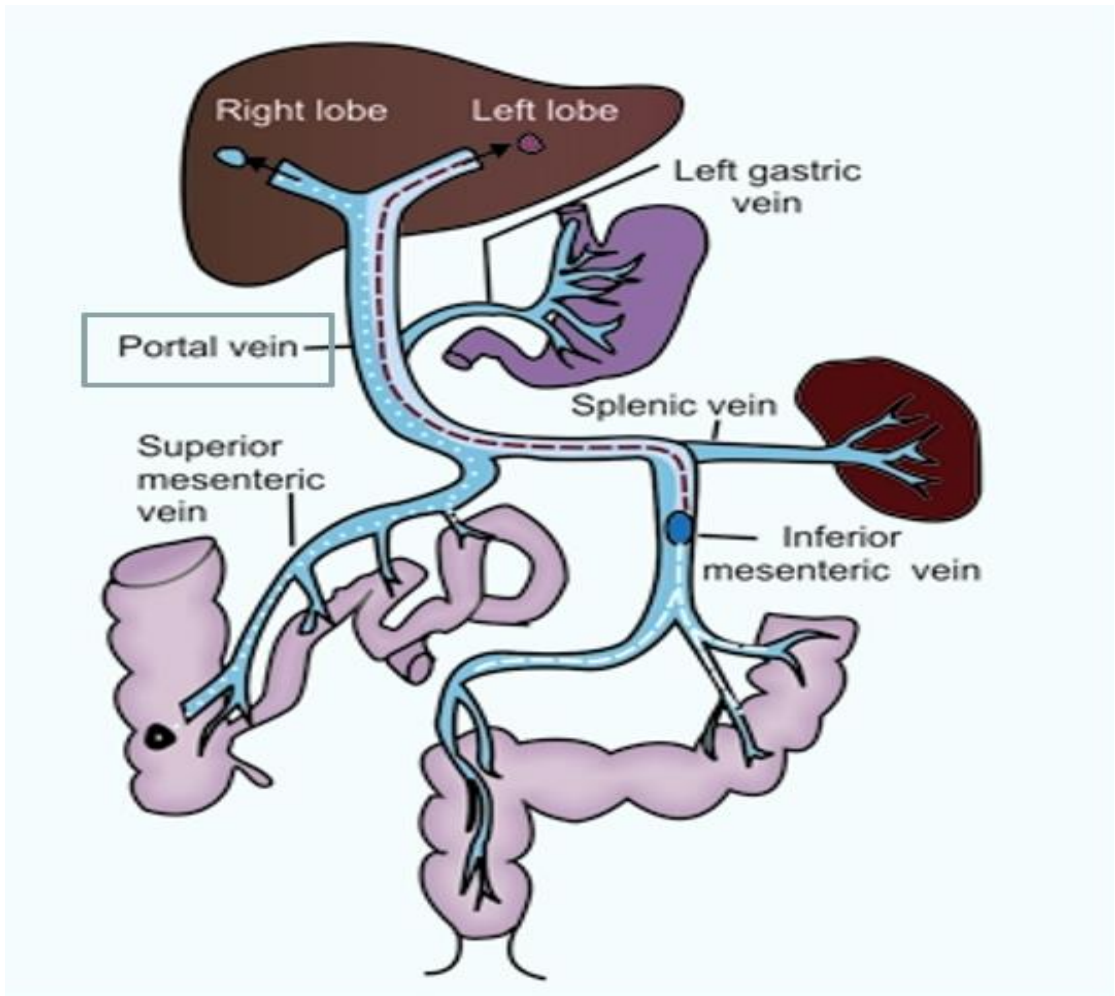
There are two portal circulations in the body:

Entero-hepatic portal circulation in which the portal vein drains products of digestion from G.I.T and transfer them to the blood sinusoids of the liver. •

**N.B:**

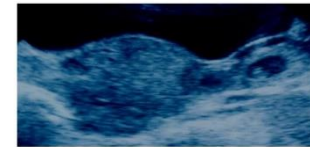
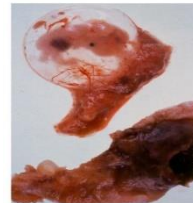
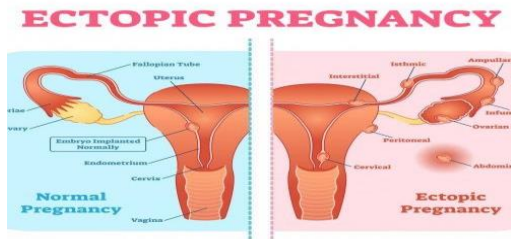
- Large arteries give and terminate by dividing into branches.
- Large veins are formed by union of tributaries.
- Portal vein begins by union of tributaries like a vein and ends by dividing into branches like an artery.





**Case 2:**

A 25-year-old woman was rushed to the hospital in the midnight because she had intense lower abdominal pain. She gave history of two missed periods. Vaginal examination revealed early pregnancy and ultrasound of pelvic cavity showed empty uterus and fluid in pouch of Douglas. This is a case of tubal



Tubal Ectopic Pregnancy

ectopic pregnancy.

**Objectives for brain storming:**

1. Name the common site of ectopic pregnancy. (A) **Uterine tube**

**Implantation**

**Definition:** it is the process by which the blastocyst embeds itself in the endometrium of the uterus.

**Onset:** it begins at the *end* of the first week and is completed by the *end* of the second week of pregnancy.

**Normal and abnormal sites of implantation**

- i. **Normal site of implantation:** in the upper part of the posterior wall of the uterus.
- ii. **Abnormal sites of implantation:** (they follow abnormal sites of fertilization).

- In the lower part of the uterus, near the internal os. giving rise to placenta previa.
- In the uterine tube (tubal pregnancy). It usually ruptures within 1 – 2 months leading to internal haemorrhage.
- In the ovary (ovarian pregnancy).

2. Discuss the epithelial lining of uterine tube and how it adapts for its function. And discuss the process of cell polarity or modification (H)

**Simple columnar ciliated epithelium**

Tall cells carry cilia.

-Basal oval nucleus

Movement of particles or fluids over surface

-Lung bronchioles

-Uterus

-Oviduct

Cell polarity [Specializations]

Cell modifications

I. Apical Modifications

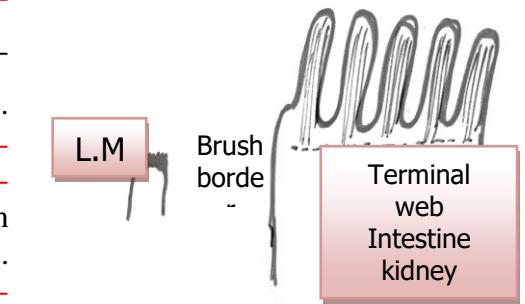
Microvilli: 1-

Finger like projections from the cell Membrane.

L.M: apical brush border.

EM: have a core of actin filaments which maintain its shape & help shortening & elongation of microvilli.

Site & function: ↑ surface area for



absorption e.g. in small intestine

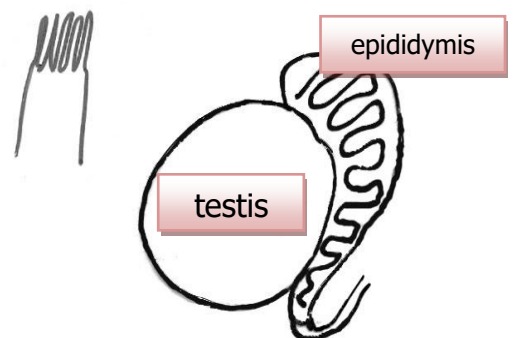
Stereocilia: (solid= non- motile) 2-

Not true cilia but long microvilli.

L.M: hair like processes from the free surface of some cells.

E.M: Have a core of actin filaments.

Function & Site: help absorption e.g., epididymis.



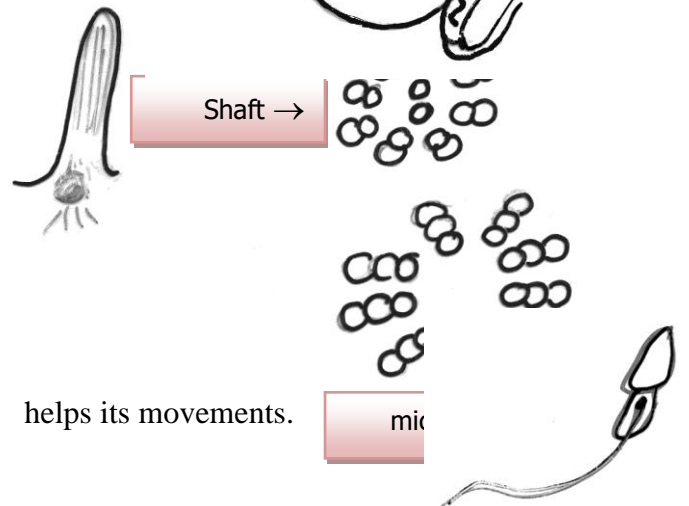
Cilia: 3-

L.M: hair like processes which arise from the free surface of some cells.

E.M: have a core of 20 microtubules arranged peripherally as doublets & 2 central singlets covered

rhythmic beating propels fluids or particles: trachea, bronchi

The flagellum is an extra-long cilium that forms



II. Lateral specializations= Cell junctions

Tight junction:

Zonula Occludens: a-

The 2 adjacent cell Membranes fuse completely at certain points to prevent passage of any substance between cells. It surrounds the apex of the cell like a belt.

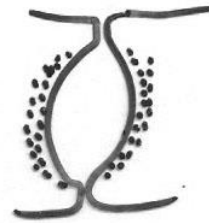


**Fascia Occludens:** It is patchy fusion of the 2 cell membranes (not like a belt) e.g., between endothelial cells.



**Adherens junction= zonula adherens:** 2]

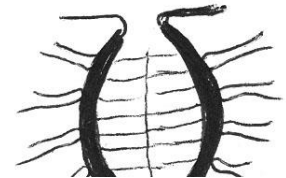
The 2 adjacent cell membranes are separated by a wide space (20nm) filled with adhesive cell coat material with condensed actin filaments at the cytoplasmic side. It surrounds the cell like a belt.



**Function:** It fixes adjacent cells & prevents their separation.

**Macula Adherens= Desmosome** 3]

The 2 adjacent cell membranes are separated by a very wide space (30 nm) filled with adhesive substance. The cytoplasmic side is thickened forming attachment plates in which tonofilaments are inserted forming hair pin- like loops. It does not encircle the cell but appears as spot.



**Function:** Strongest type fixes epithelial cells e.g., in skin.

**Gap junction: [Communicating J.] = nexus.** 4]

The 2 adjacent cell membranes are separated by a very narrow gap (2nm) but connected by narrow channels.



**Function:** allows passage of ions or impulses from one cell to the other e.g., cardiac & smooth muscles.



N.B. If more than one junction is present between adjacent cells e.g., cells of the small intestine it is called junctional complex.

III. Basal specializations

**Hemidesmosome** 1]

- 1/2 a desmosome at the basal part of basal cells.
- It fixes epithelium to basement membrane & connective tissue.

**Basement membrane:** 2]

- The membrane that connects epithelium to connective tissue.
- **L.M:** Red line (by PAS) or brown (by AG).
- It is either clear (thick) as in skin.
- OR non- clear (thin) as in transitional epithelium.
- **E.M:** 2 components
- 1-Basal lamina formed mainly by the cell coat of epithelium (glycoprotein) & collagen fibers (IV)
- 2-Reticular lamina : consists of reticular fibers (type III collagen) & glycoprotein.

**Functions:** -

- 1- Supports epithelium.
- 2- Fixes epithelium to connective tissue.



3- Controls passage of ions & nutrients e.g., kidney & lung.

Basal Infoldings: 3]

- The basal cell membrane shows invaginations.
- Dividing the base of the cell into compartments
- Contain mitochondria to give energy for active transport of ions e.g., in kidney tubules.

3. Discuss normal process of implantation. (A)

Mechanism of implantation

- By the 7<sup>th</sup> day, the trophoblast splits into an *outer* syncytiotrophoblast and an *inner* cytotrophoblast.
- The syncytiotrophoblast (over the embryonic pole) presents many finger-like processes which invade and erode the endometrium and maternal blood vessels.
- After complete implantation, its site is closed by fibrinous tissue (closing plug), followed by regeneration of the epithelium over the implantation site.

4. Which embryological event normally takes place at tubes and discuss this event? (A)

Fertilization

■ **Fertilization is preceded by capacitation and acrosome reaction of the sperms.**

**1. Capacitation of the sperms:**

- It occurs in the uterus.
- A glycoprotein is removed from the acrosome of the sperm. This increases the *activity* of the sperms.

**2. Acrosome reaction of the sperms:**

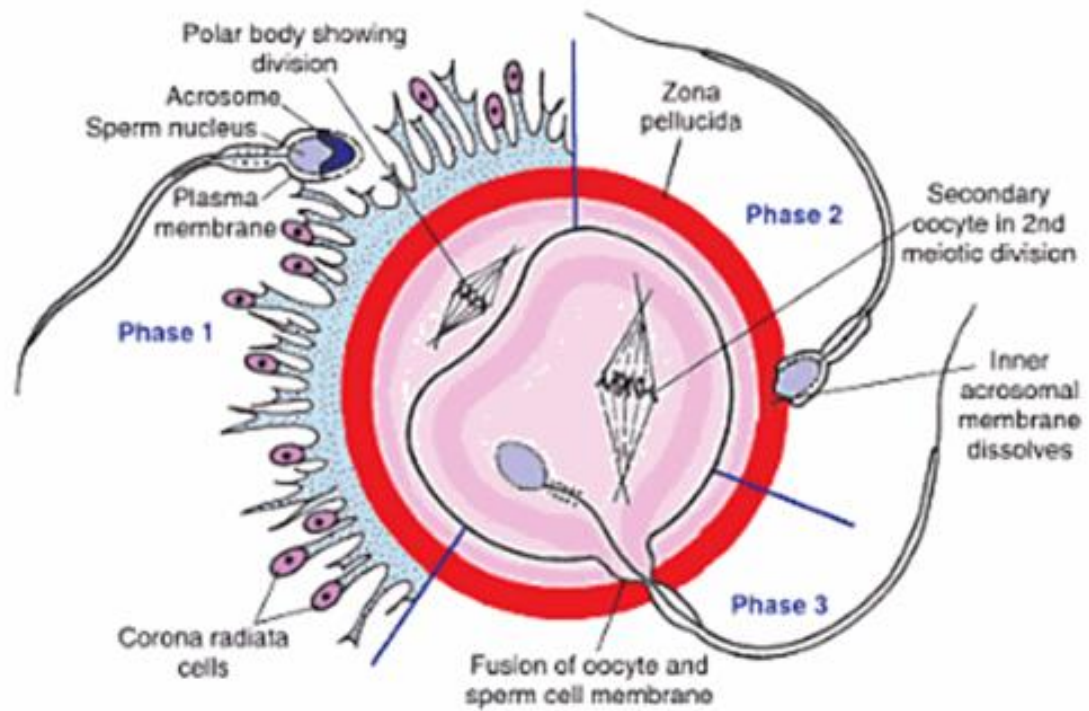
- It occurs in the uterine tube.
- Multiple perforations develop in the acrosome of the sperm leading to release of enzymes that facilitate the process of fertilization.

■ Fertilization is the fusion between a single sperm and an ovum to form a zygote.

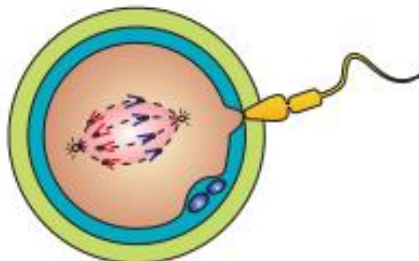
**Site and duration:** it occurs in the ampulla of the uterine tube and lasts for 24 hours.

**Process of fertilization:**

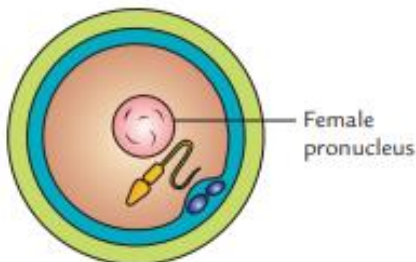
1. Penetration of corona radiata by *many* sperms.
2. Penetration of zona pellucida by a *single* sperm, followed immediately by *zona reaction*, which makes zona pellucida *impermeable* to other sperms.
3. Fusion of the cell membranes of the sperm and secondary oocyte. Only the head and tail of the sperm enter the cytoplasm of the secondary oocyte. This is immediately *followed* by completion of the second meiotic division of the secondary oocyte forming a mature ovum and a second polar body.
4. Formation of male and female pronuclei:
  - The nucleus of the head of the sperm separates and enlarges to form the male pronucleus.
  - The nucleus of the mature ovum forms the female pronucleus.
5. Fusion of the male and female pronuclei with *loss* of their nuclear membranes to form a new cell called the *zygote*.



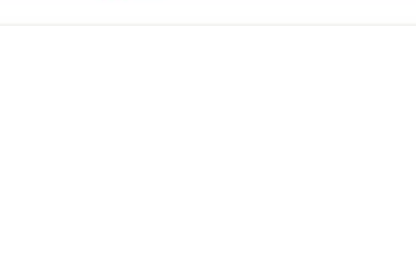
**B** Penetration of sperm through zona pellucida



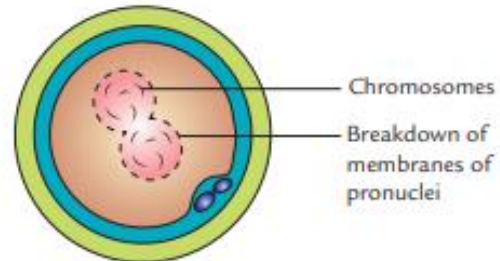
**C** Fusion of cell membranes of oocyte and sperm



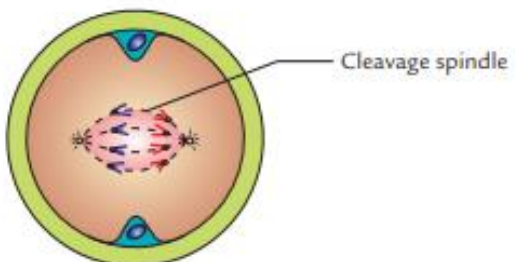
**D** Entry of sperm within oocyte



**E** Formation of male and female pronuclei



**F** Replication of DNA from 1n to 2n



**G** Formation of zygote (chromosomes of the zygote get arranged on the equatorial plane)



### **Results of fertilization:**

1. The secondary oocyte *completes* its second meiotic division, giving rise to a mature ovum and second polar body.
2. Restoration of the diploid number of chromosomes (46).
3. Sex determination:
  - Fertilization by X – bearing sperm will form XX zygote giving rise to a female.
  - Fertilization by Y – bearing sperm will form XY zygote giving rise to a male.
4. Initiation of cleavage of the zygote, which is a series of rapid successive *mitotic* divisions.
5. Which embryological event takes place at this site (tubes) to cause ectopic pregnancy? (A) **Implantation of blastocyst**

### **Implantation and changes in the blastocyst.**

**Definition:** it is the process by which the blastocyst embeds itself in the endometrium of the uterus.

**Onset:** it begins at the *end* of the first week and is completed by the *end* of the second week of pregnancy.

#### **Normal and abnormal sites of implantation**

- iii. **Normal site of implantation:** in the upper part of the posterior wall of the uterus.
- iv. **Abnormal sites of implantation:** (they follow abnormal sites of fertilization).
  - In the lower part of the uterus, near the internal os giving rise to placenta previa.
  - In the uterine tube (tubal pregnancy). It usually ruptures within 1 – 2 months leading to internal haemorrhage.
  - In the ovary (ovarian pregnancy).

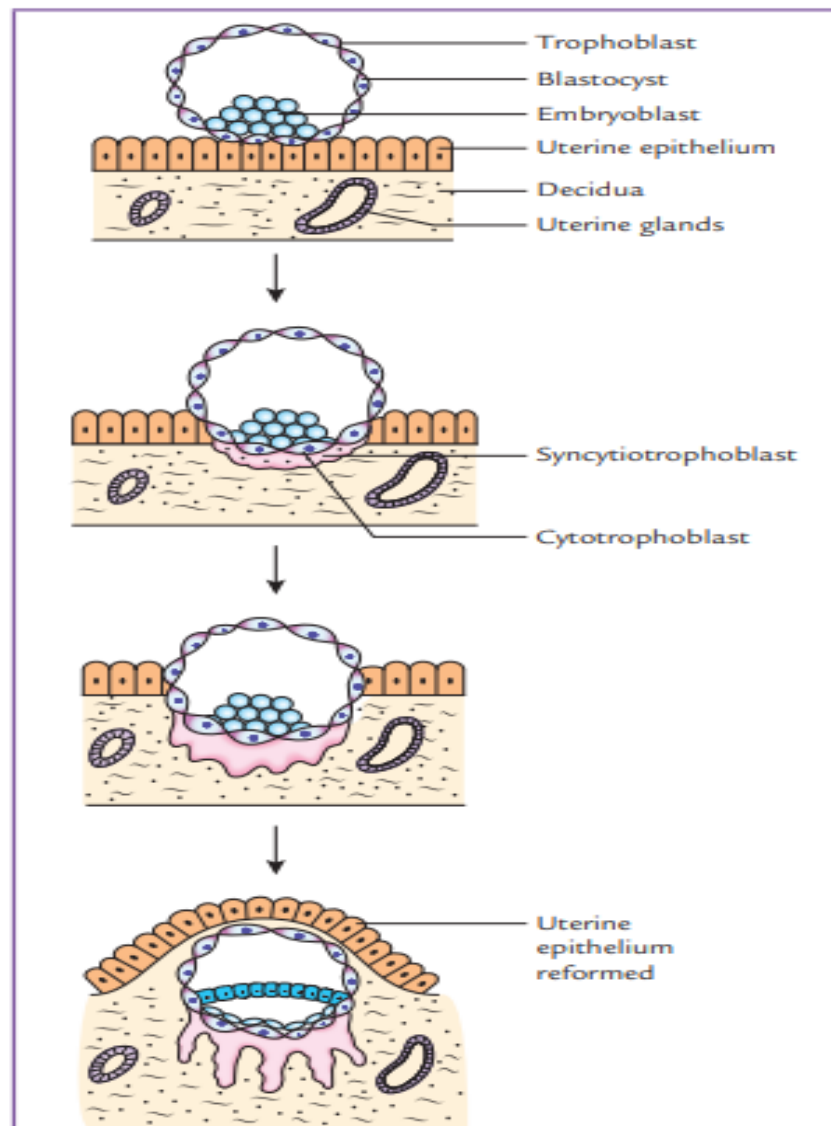
#### **Mechanism of implantation**

- By the 7<sup>th</sup> day, the trophoblast splits into an *outer* syncytiotrophoblast and an *inner* cytotrophoblast.

- The syncytiotrophoblast (over the embryonic pole) presents many finger-like processes which invade and erode the endometrium and maternal blood vessels.
- After complete implantation, its site is closed by fibrinous tissue (closing plug), followed by regeneration of the epithelium over the implantation site.

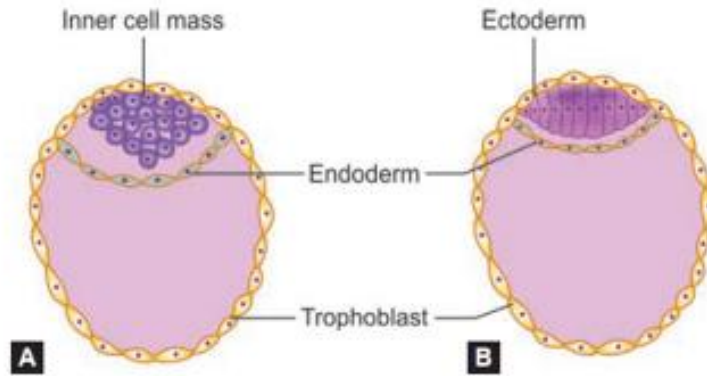
**Changes in the blastocyst during implantation in the second week of pregnancy (The rule of two):**

1. The trophoblast *completes* its differentiation into *outer* syncytiotrophoblast and an *inner* cytotrophoblast.
2. The embryoblast differentiates into epiblast and hypoblast (or ectoderm and endoderm respectively).
3. Two cavities are formed: amniotic cavity (*dorsal* to the ectoderm) and primary yolk sac (*ventral* to the endoderm). The latter sac *replaces* the blastocoele of the blastocyst.

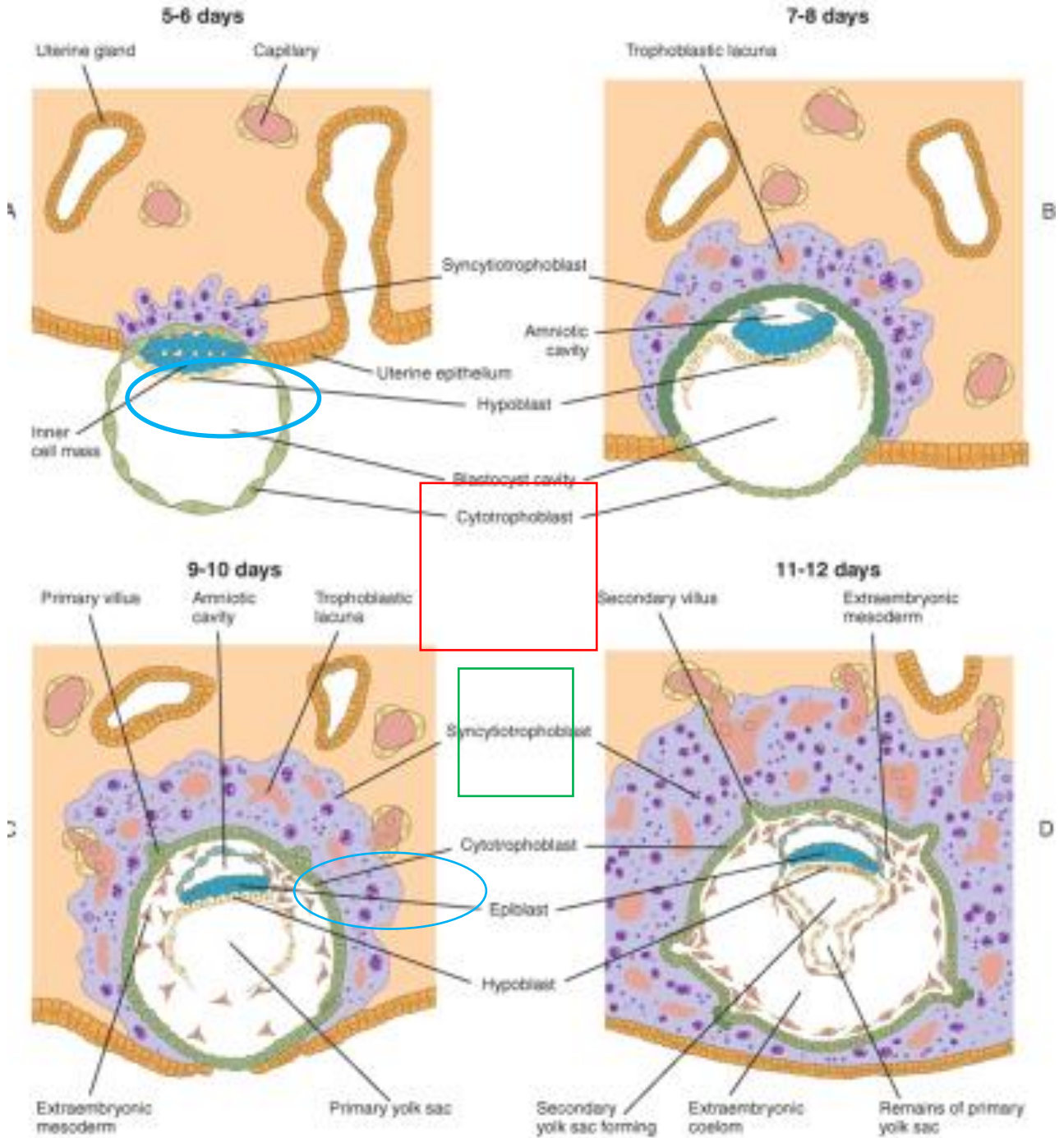


**Fig. 6.5** Steps of implantation.

6. What is the



Amniotic cells

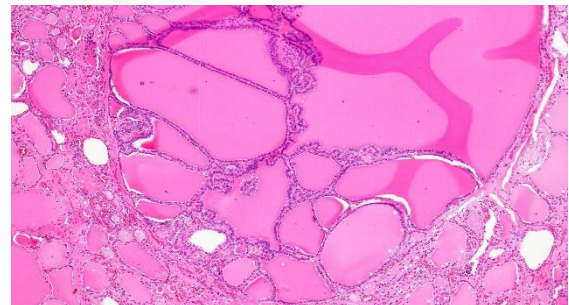


natural fate of pregnancy at this site ? (A)free search.

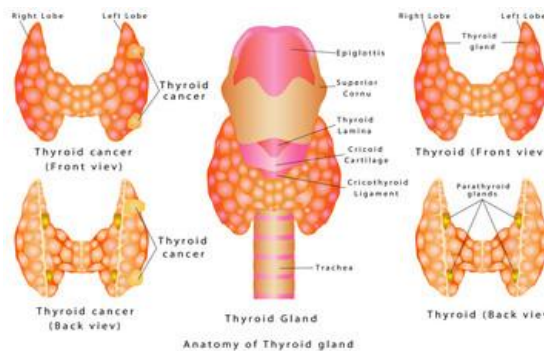
Rupture of the uterine tube with bleeding in peritoneal cavity with accumulation of blood in pouch of Douglas.

**3-Case 3:**

A 45-year-old female was attended to the internal medicine clinic complaining from a swelling in the front of the neck, after clinical examination of the neck, the doctor order some investigations and measure the vital signs of the patient ,elevated blood pressure is found. The doctor diagnosed this case as goiter.



Sanderson's polster in nodular hyperplasia: aggregate of small follicles at one pole of large colloid nodule (H&E, x10)



**Objectives for brain storming:**

- **Key words :** vital signs :blood pressure ,temperature ,pulse,

**Goiter:** enlarged thyroid gland.

- 1) Mention the type of epithelium of this gland. (H)
- 2) Mention the type of secretion of this gland and the other different types of secretions and the mechanisms of secretion. (H)

**Glandular Epithelium II-**

Definition:

It is a type of epithelium which modifies to act as a gland & give secretion.

Classification of glandular epithelium according to:

1-Presence or absence of duct:

Exocrine gland (salivary glands): a)

The exocrine gland is formed of secretory portion & duct system.

Endocrine gland, ductless gland,(thyroid gland): b)

- NO duct system.
  - Their secretion is called hormones.
  - Secre
- tion is carried by blood.

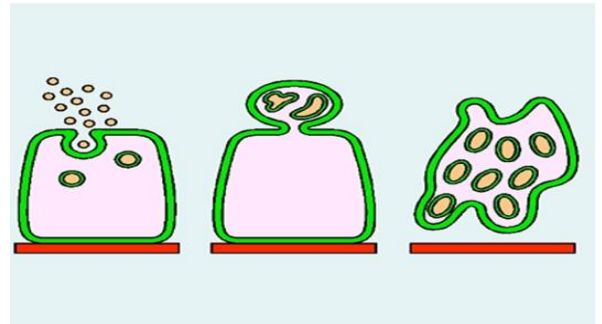
Mixed gland (pancreas): c)

The gland is formed of two parts exocrine part & endocrine part.

2-Number of cells forming the gland:

Unicellular gland, formed of one cell (goblet cell) a)

Multicellular glands formed of many cells (all glands) b)



3-Type of secretion:

Watery secretion (Sweat gland) a)

Serous secretion: The secretion is watery but contains enzymes e.g., parotid gland & pancreas. b)

Mucous secretion: e.g., Salivary gland & goblet cells. c)

Muco-serous secretion e.g., sublingual & submandibular gland. d)

Fatty secretion → sebaceous gland. e)

Waxy secretion → glands of external ear. f)

Cellular secretion → ovary (ova) & testis (perms). h)

4-Mode (mechanism) of secretion:

**a) Merocrine secretion:**

- The most common mechanism
- Secretion comes out by exocytosis.
- No changes in the cell e.g., pancreas.

**b) Apocrine secretion:**

- The secretion is released surrounded by a part of cytoplasm & the cell membrane usually the apex of the cell.
- e.g., mammary gland & some sweat glands.

**c) Holocrine secretion:**

- The secretion accumulates within the cell.
- The swollen cell ruptures & secretions come out e.g., sebaceous glands.

5-Branching of the duct:

Simple gland: The gland has a single non branching duct. a)

Simple branched gland: The gland has a single non branching duct & a branched secretory portion. b)



Compound gland: The gland has a branching duct system. c)

6-Shape of secretory part:

Tubular: Secretory part is in the form of a long tube a)

Alveolar (acinar):- Secretory part is rounded or ball shape. b)

Tubuloalveolar:- Secretory part is flask shape. c)

N.B. Since all exocrine glands consist of a secretory part & a duct system so they are classified into:

Tubular: i)

Simple tubular glands e.g., intestinal glands. -

Simple branched tubular glands e.g., fundic glands of stomach -

Simple coiled tubular e.g., sweat glands. -

Compound tubular glands e.g., kidney, liver -

Alveolar: ii)

Simple alveolar glands e.g., sebaceous glands. -

Simple branched alveolar glands e.g., sebaceous glands. -

Compound alveolar glands e.g., mammary gland -

Tubulo-alveolar: iii)

Simple tubulo-alveolar gland, not present in man.

Simple branched tubulo-alveolar glands e.g., lingual, labial glands (minor salivary glands).

Compound tubulo-alveolar glands e.g., major salivary glands (parotid) & pancreas.

3) Discuss the anatomy of this gland. (A)

■ **Thyroid gland**

**Site :** It lies in the lower part of the neck, clasps the anterolateral surfaces of the pharynx, larynx, esophagus, and trachea opposite C5, 6, 7 and T1 vertebrae.

**Description of the gland :** The gland is formed of right and left lobes connected by an isthmus :

A. The lobe of the gland has ( fig.137 ) :

1. Apex : reaches the oblique line of the thyroid cartilage of the larynx.
2. Base : reaches down to the level of the 6<sup>th</sup> tracheal ring.
3. Medial surface : is related to ( fig.139 ) :

- 2 tubes above : larynx and pharynx.
- 2 tubes below : trachea and esophagus.
- 2 nerves : *external* laryngeal and *recurrent* laryngeal nerves.

B. Isthmus of the gland covers 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> tracheal rings.

Fig. 11.2 Parts and extent of the thyroid gland.

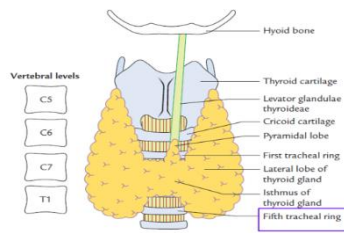
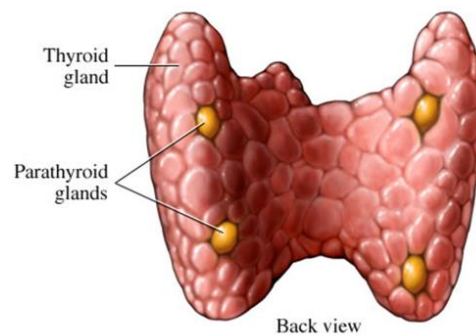


Fig. 11.2 Parts and extent of the thyroid gland.

## ■ Parathyroid glands

- They are 4 in number; all lie posterior to and *within* the capsule of the thyroid lobe
- They secrete parathyroid hormone which maintains the calcium level in the blood.



### 4) Discuss different types of endocrine glands. (A)

- Pituitary gland.
- Thyroid gland.
- Parathyroid glands.
- Suprarenal glands.
- Islets of Langerhans of the pancreas ( discussed ).
- Interstitial cells of Leydig of the testis ( discussed ).
- Ovaries ( discussed ).

#### ➤ Pituitary gland

**Site** : It lies in the hypophyseal fossa ( Sella turcica ) of the middle cranial fossa of the skull  
**weight** : 0.5 gm.

**Important relations ( fig.136 ) :**

1. Superiorly : it is connected to the hypothalamus by the infundibulum ( Pituitary stalk ).
2. Inferiorly : it is related to the sphenoid bone which contains the sphenoidal air sinuses.

## ➤ Suprarenal glands

**Site and description ( fig.140 ) :**

- They are yellowish retroperitoneal structures which lie on the upper poles of the kidneys.
- The right gland is **pyramidal** in shape and lies behind the right lobe of the liver.
- The left gland is **crescentic** in shape and lies behind the left part of the pancreas.

**Structure of the gland :** it is formed of

1. Cortex : is the **outer** part of the gland and secretes.
2. Medulla : is the **inner** part of the gland and secretes epinephrine and norepinephrine.

**Nerve supply of the gland** is mainly by **preganglionic** sympathetic nerve fibres which relay in the suprarenal medulla which is considered as a **modified** sympathetic ganglion.

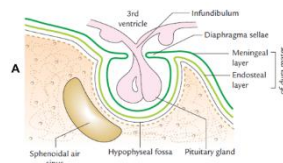
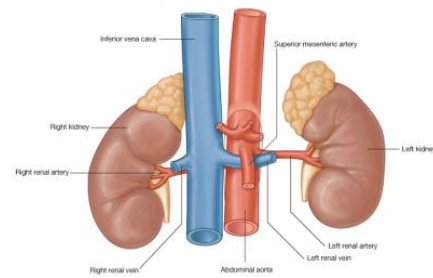
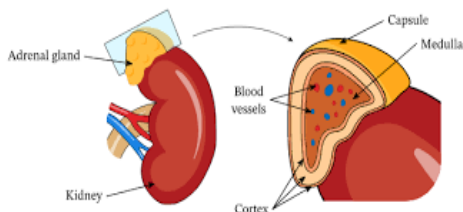


Fig. 21-19 Location of hypophysis cerebri (pituitary gland).

ands

➤ **The Pancreas**

**Site** : It lies in the concavity of the duodenum.

**Parts** : It has a head, neck, body, and tail .

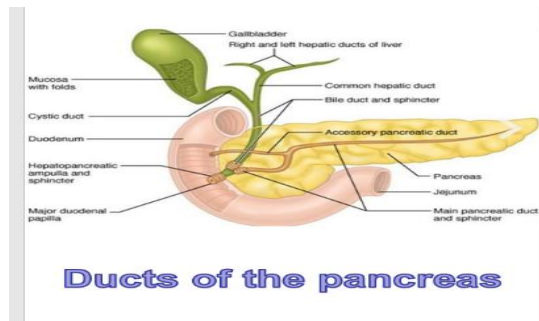
**Ducts** : It has **2** ducts ::

The main pancreatic duct that usually unites with the bile duct to form the hepato – pancreatic duct which opens in the middle of the second part of the duodenum. •

The accessory pancreatic duct opens in the second part of duodenum **2 cm** • *above* the main pancreatic duct.

**Functions of the pancreas :**

- Exocrine function: it secretes the alkaline pancreatic juice to digest fatty foods.
- Endocrine function (islets of Langerhans): it secretes insulin into the venous circulation.



➤ **Ovaries**

- Primary sex organs which are the ovaries for production of ova and secretion of female hormones, estrogens and progesterone)

-Site : In the lateral wall of the pelvis.

-Dimensions : 3 x 1.5 x 1 cm for length, breadth, and thickness respectively. ---

Description : It has

- 2 ends: superior and inferior.
- 2 borders: anterior and posterior.
- 2 surfaces : lateral and medial.

**-Blood and nerve :**

- Arterial supply by the ovarian artery from the abdominal aorta
- Venous drainage by ovarian vein, which ends on the right side in the I.V.C and on the left side ends in the left renal vein (compare with the testicular veins).
- Nerve supply by autonomic nerve fibers.

➤ **Testis**

(Primary sex organs : the testes for production of sperms and secretion of male sex hormone, testosterone)

It is suspended in the scrotum by the spermatic cord.

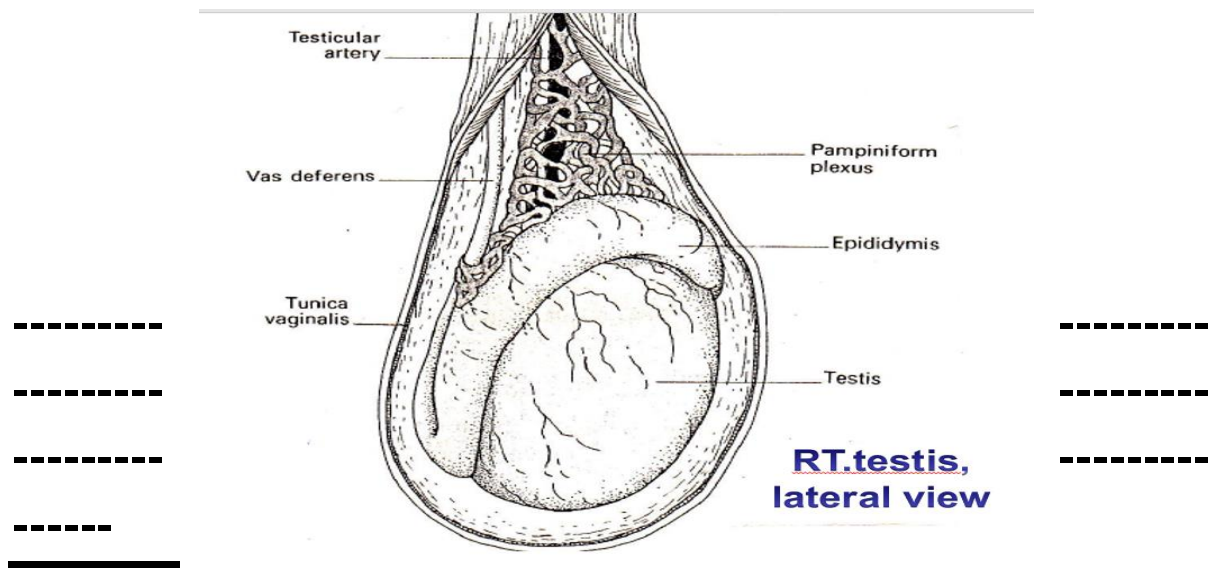
- Dimensions : 1.5 x 1 x 1/2 inches for length, anteroposterior diameter, and thickness respectively.
- Description: It has:
  - 2 poles : superior ( related to *head* of epididymis ) and inferior.
  - 2 borders : posterior ( related to *body* of epididymis ) and anterior.
    - 2 surfaces : medial and lateral.

2 coats : tunica albuginea ( which is an *inner* fibrous coat surrounds the testis all around ) and tunica vaginalis ( which is an *outer* serous membrane which covers front and sides of the testis.

**N . B :** Sperms leave the testis via 20 efferent ductulus which pass to the head of the epididymis.

**Blood and nerve supply of the testis :**

- Arterial supply by testicular artery from the abdominal aorta.
- Venous drainage by pampiniform plexus which surrounds the testicular artery and gives rise to testicular vein which ends in the right side in the I.V.C and on the left side in the left renal vein.
- Nerve supply by the sympathetic nerve fibers.



**IBF module :****Case: Respiratory alkalosis + action of sympathetic system on body organs**

A 20 year old patient admitted to emergency room with severe attack of anxiety that cause him to try to suicide in last half an hour. On examination, The patient has rapid breathing as RR was 22, BP was 160/100 and pulse was 120 and severely agitated. The relatives said that he was diagnosed with generalized anxiety disorder (GAD) and taking his medications regularly but his mother died 2 days ago. ABG was done that revealed PH was 7.92, PCO<sub>2</sub> was 20 and HCO<sub>3</sub> was 26.

Case: Metabolic acidosis + action of parasympathetic on body organs

A 35-year-old man presented to clinic with acute pain in the left flank. On physical examination his blood pressure was 90/60, pulse 55 and its Urine analysis revealed haematuria. On abdominal ultrasound, the radiologist reported renal stone. Diclofenac and norfloxacin were prescribed and the patient was prepared for surgical intervention (ESWL).before operation, Arterial blood gases revealed that PH was 7.2, PCO<sub>2</sub> was 35 and HCO<sub>3</sub> was 16 that revealed that normalization of acid- base balance before procedure should be done.

**Module IHI :****Case 1: Superantigen**

47-year-old women developed toxic shock following an infection with a strain of *Staphylococcus aureus* that produced toxic shock syndrome toxin (TSST)-1.

The toxin binds directly to MHC class II molecules on macrophage

**Objectives for brain storming**

- 1-Mention characters of superantigen (immunology)
- 2-Mention how it differs from ordinary antigen (immunology)
- 3- Mention differential diagnosis of shock ( phys.)

**Case 2: Chronic Immune Thrombocytopenia Purpura****(Physiology and histology integrated cases)**

A 52-year-old woman with a history of hypertension returned to clinic for continued management of chronic immune thrombocytopenia purpura (ITP).

She was diagnosed three years previously when she presented to her primary care provider with petechiae and was found to have isolated thrombocytopenia with a platelet count of 3,000/ $\mu$ L. She was referred to a hematologist and was initially treated with high-dose steroids, with appropriate response. However, duration of response was short, and she ultimately required multiple additional lines of therapy to maintain platelet count above 30,000/  $\mu$ L, including splenectomy, rituximab, eltrombopag, and immunosuppression. A bone marrow

biopsy was performed and revealed increased megakaryocytes without evidence of dysplasia with normal cytogenetics and molecular analysis, confirming the diagnosis of ITP.

### **Objectives:**

- 1- Mention Structure & functions of platelets (histology)
- 2- Mention bleeding time and abnormalities of hemostasis (physiology)

### **Case 3 anaemia**

#### **(Physiology and histology integrated cases)**

A 50-year-old man comes to his family physician complaining of fatigue. The patient indicates that climbing the stairs leaves him short of breath and that this has been getting progressively worse over the past month. He does not participate in any regular exercise. The patient works in a stressful job and to relieve stress the patient smokes, drinks 6 cups of coffee a day, and has two or three alcoholic drinks after work. He has been taking aspirin for the last 6 months for frequent stomach pain. The patient has decreased caloric intake for the past 3 months in an effort to lose weight, with moderate success.

#### PHYSICAL EXAMINATION

VS: T 36°C, P 105/min, R 24/min, BP 90/75 mm Hg,  
BMI 33

PE: Upper and lower endoscopy reveals a bleeding gastric ulcer.

#### LABORATORY STUDIES



Hematocrit: 30%

Red blood cell smear: Microcytic hypochromic cells

Serum ferritin: 20 µg/L

### **Objectives for brain storming**

- 1- Mention types and causes of anemia (Phys)
- 2- Mention Abnormalities in shape, size & colors of RBCs (Histo)
- 3- Mention Role of blood film in diagnosis of anemia (Histo)

### **Case 4 : erythroblastosis faetalis**

Mr ahmed is a twenty five years old engineer. He asked to marry Miss Amal a friend of him. On making the routine before marriage medical exams they were warned that they should consult medical supervision when they seek pregnancy.

Mr Ahmed was having blood group A+ve and Miss Amal was B-ve

Objectives :

- Discuss the erythroblastosis faetalis (physiology )
- Discuss the blood transfusion process (physiology )

Case 4 Hypersensitivity:

- **A 17 year old boy presents with itchy eyes, nasal stuffiness, increased lacrimation, sneezing and watery nasal discharge. He has similar episode in the past that have corresponded with changing of seasons. His mother is known to have bronchial asthma. Which reaction is responsible for his condition?**

### **Objectives for brain storming**

1. Describe the type of this reaction and the immunoglobulin is responsible for it (immunology)
- 4- Mention the cell responsible for the reaction, describe its structure ? (immunology) (Histology)
2. Enumerate the mediators released responsible for the reaction (immunology)

3. Describe the immunological lines of treatment of this reaction (immunology)

### **Module IMB :**

#### **Case 1: Familial hyper polyposis (Familial adenomatous polyposis, FAP)**

A 48-year-old man presented to the emergency department for high-intensity abdominal pain in the last two days associated with two episodes of emetic food content and three episodes of greenish diarrhea without blood or mucus. Physical examination revealed generalized pain on deep palpation of the abdomen without the presence of peritoneal signs. He mentions unquantified weight loss in the last six months. Notable in his past medical history is the multiple members of his family with intestinal polyps and colon cancer. Further history, clinical exam, laboratory tests, and colonoscopy demonstrated findings consistent with FAP. A total colectomy was eventually performed, followed by an ileorectal anastomosis.

#### **Histology:**

1. What is the genetic basis for the disease
2. What is the genetic test for FAP?
3. What is APC genetics?

#### **Biochemistry:**

1. Mention different mechanisms for DNA repair
2. Mention defect of repair in familial hyper polyposis