



# Histology Sheet No.

# 6

**Writer**

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**Scientific correction**

Reem Ghazal

**Grammatical correction**

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Notes:

Dr. Ghada's speech is in black color.

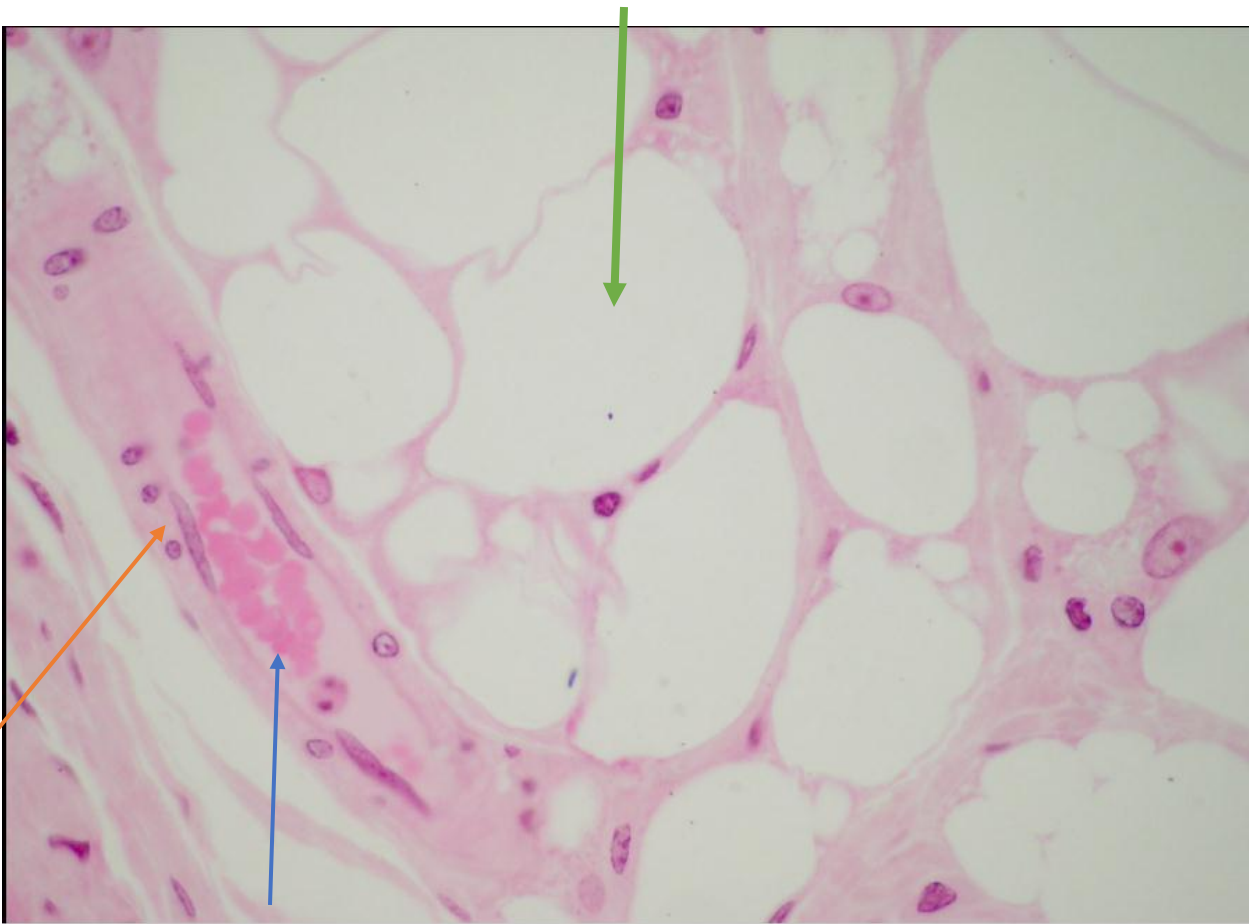
Additional information is in light blue

Location of the section in green

ينصح الخبراء بدراسة سلايدات الدكتور حنان (epithelium 2) تجدونها على موقع

(Ju. Medicine) وذلك من أجل التمرن على مزيد من الأمثلة

Q. identify the type of tissue in each picture?

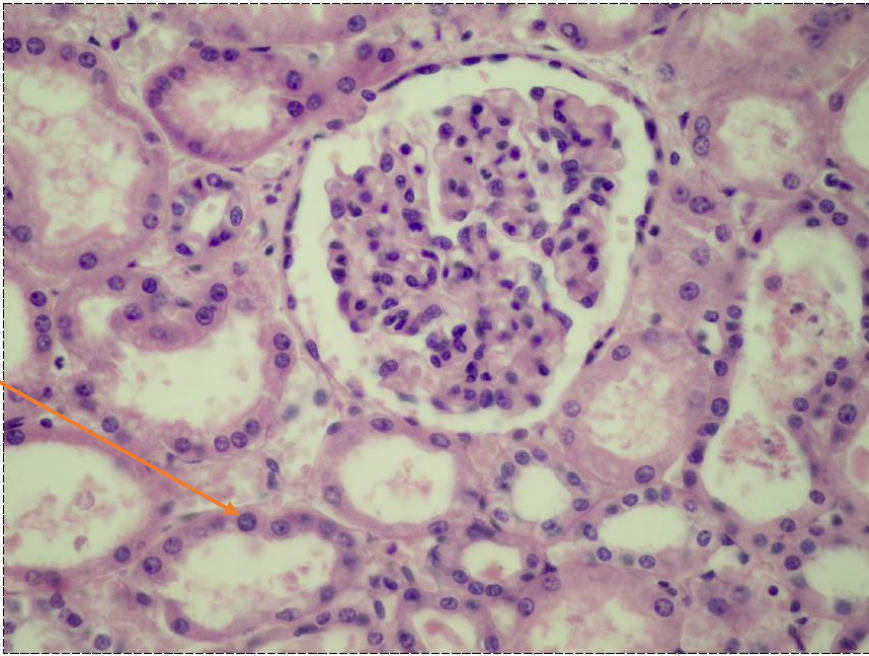


The orange arrow point to endothelium tissue.

(endothelium tissue=simple squamous tissue lines blood vessel)

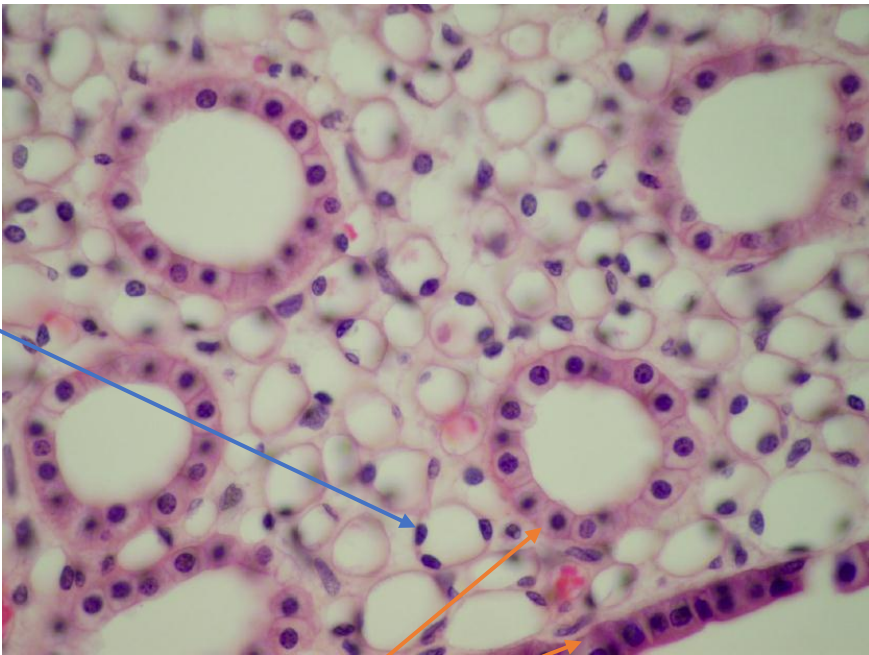
Blue arrow point to red blood cell(which is inside blood vessel and is surrounded by endothelium)

Green arrow→ adipose tissue (additional information)



orange arrow → simple cuboidal epithelium.

This section was taken from kidney.



Orange arrows → simple cuboidal epithelium.

Blue arrow → simple squamous epithelium.

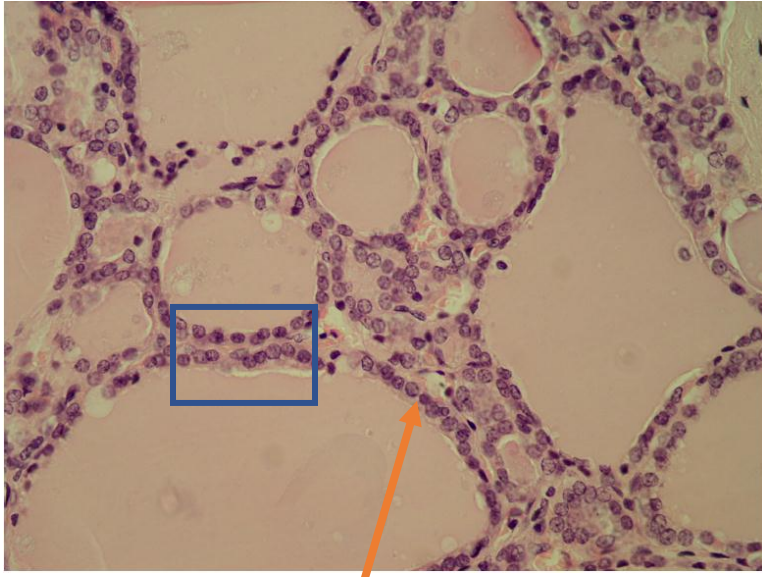
Some signs to know it

Thin wall

The volume of the cell is small compared to the cuboidal epithelium.

**Note that:**

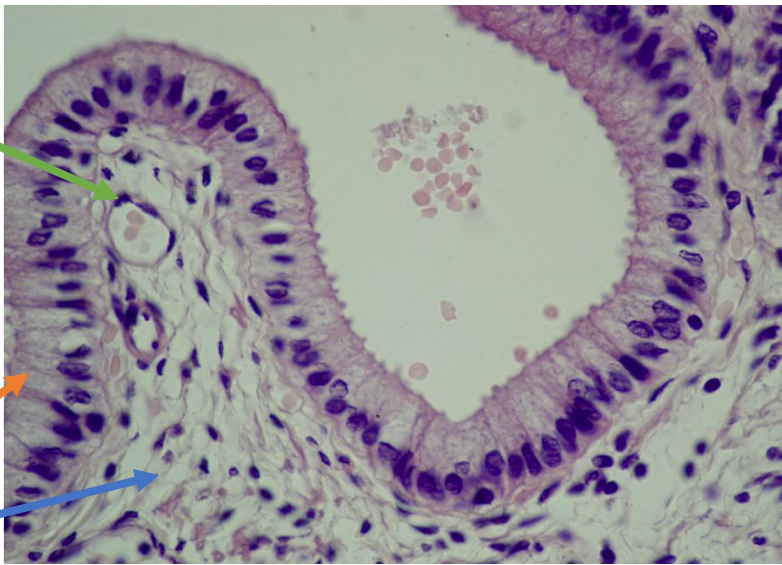
- (extremely small cytoplasm with flat nucleus) → sign of simple squamous epithelium.
- There is no standard volume of epithelium cells & their nuclei (especially columnar cells) so we depend on the shape.



Section of thyroid gland shows the follicles.

**Orange arrow** → simple cuboidal epithelium

**Blue square** → 2 separate epithelium, 1 for each follicle.



**Orange arrow** → simple columnar epithelium

(simple → 1 layer of cells & nuclei)

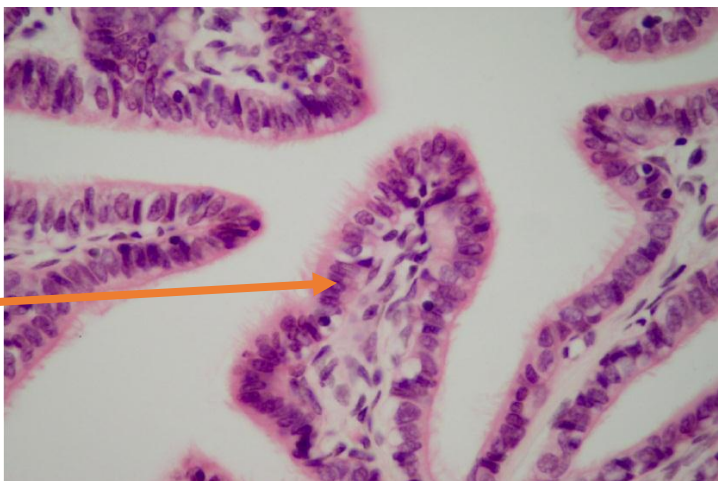
(columnar → the cytoplasm is more above the nucleus)

**Blue arrow** →

Loose connective tissue = lamina propria.

**Green arrow** → endothelium.

**Time is 9:45**

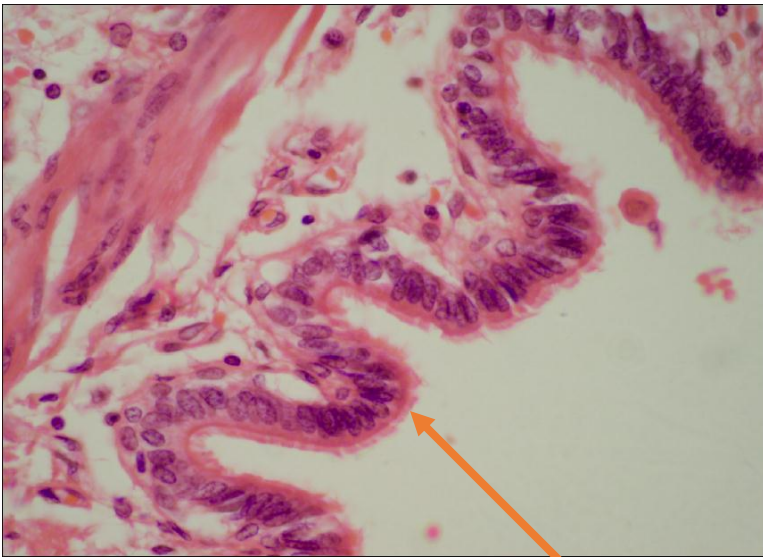


**Orange arrow** → simple columnar epithelium.

(simple → 1 layer)

(has apical modifications → columnar)

(the shape of nucleus isn't spherical, so it can't be considered as cuboidal)



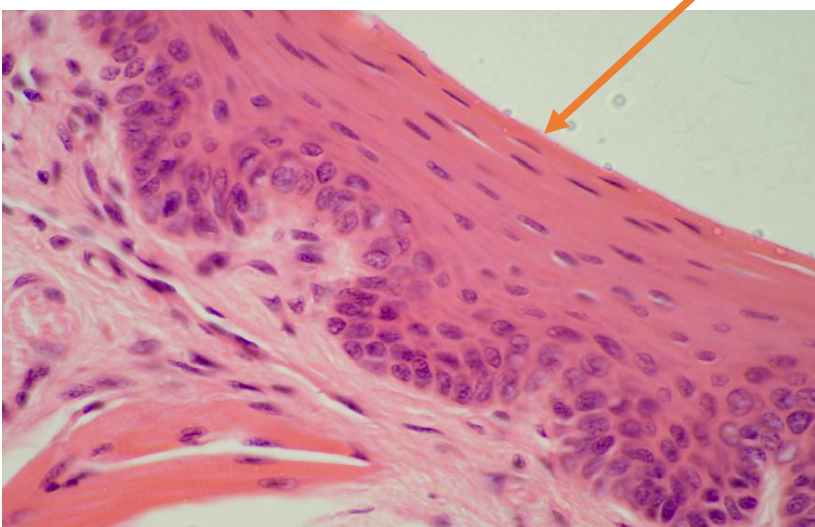
Orange arrow → simple columnar epithelium



Orange arrow → simple columnar epithelium

**Advice:**

(scan the whole tissue ,the angle of section might be tricky)



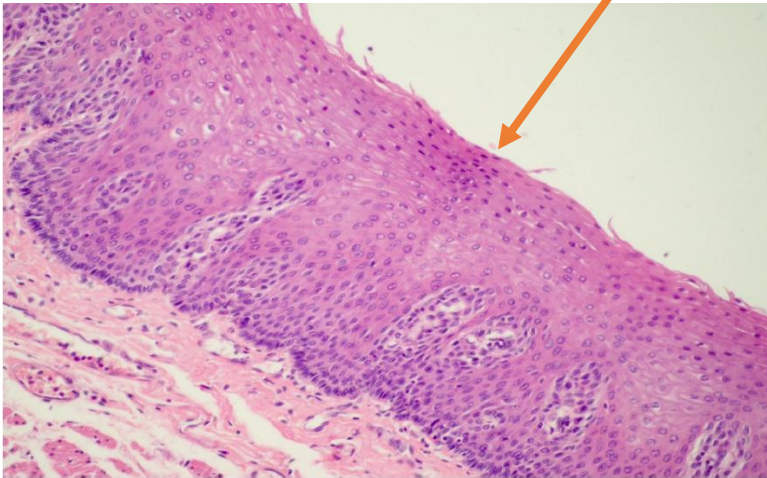
Orange arrow → stratified squamous

(non-keratinized → it has nucleus in the most superficial layer.)

The basal layer contains progenitor cells for the regeneration of the tissue.

- Stratified squamous is thinner in the cornea

(thick enough to protect & thin enough which allows passing of the light.



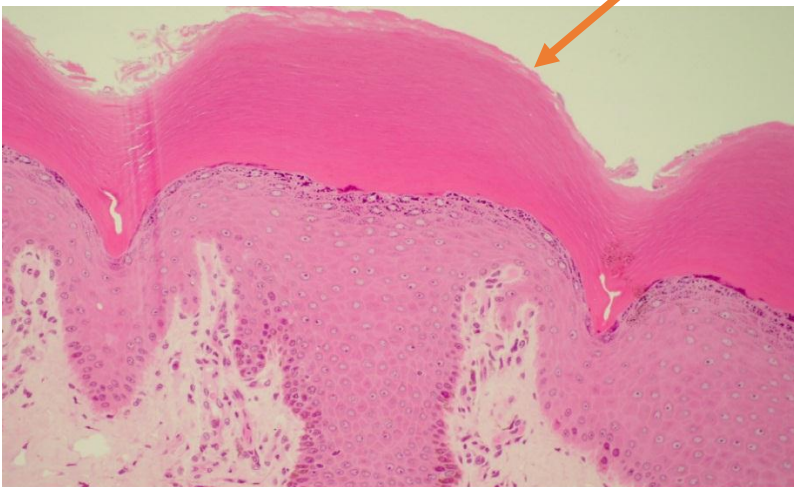
Section from esophagus.

Orange arrow → stratified squamous non-keratinized.

The big number of layers give protection to the organ.

(because a lot of food with different temperatures pass from this area)

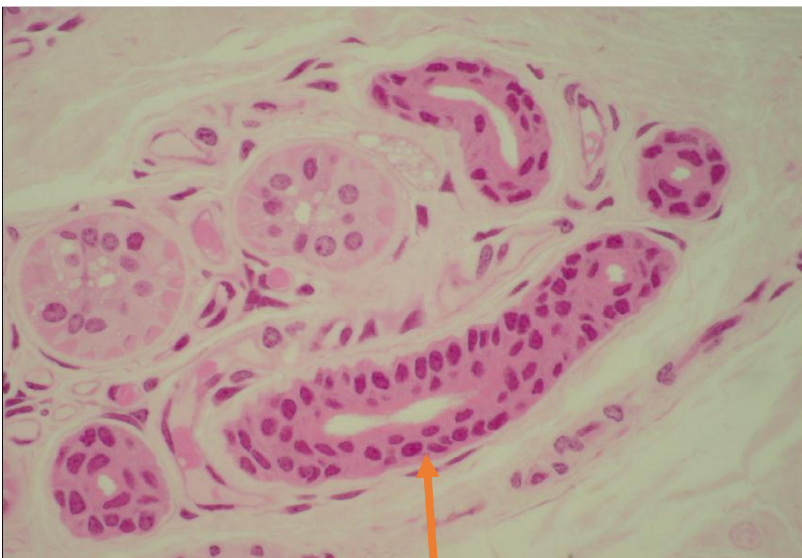
Time is 20:00



Orange arrow → stratified squamous keratinized.

(keratin is acidophilic)

The living cells near the surface are just sacs of keratin.



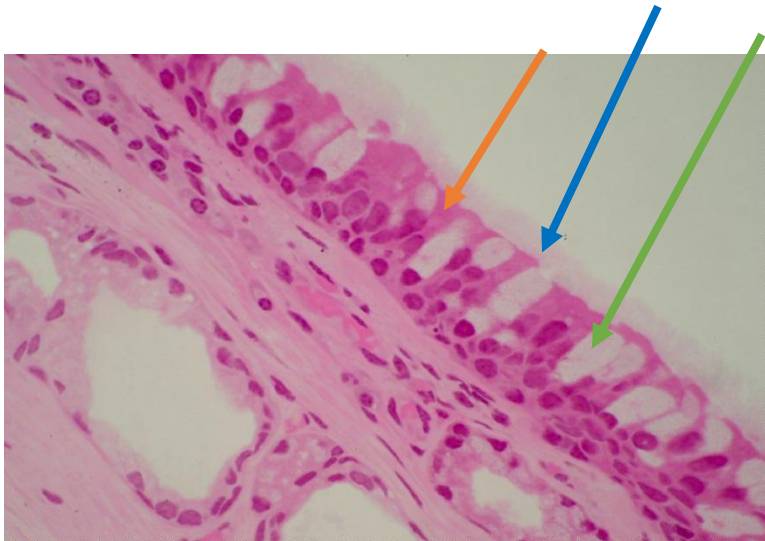
The section from the duct system of glands.

Orange arrow → stratified cuboidal epithelium.

Some signs:

(shape of nucleus → almost spherical)

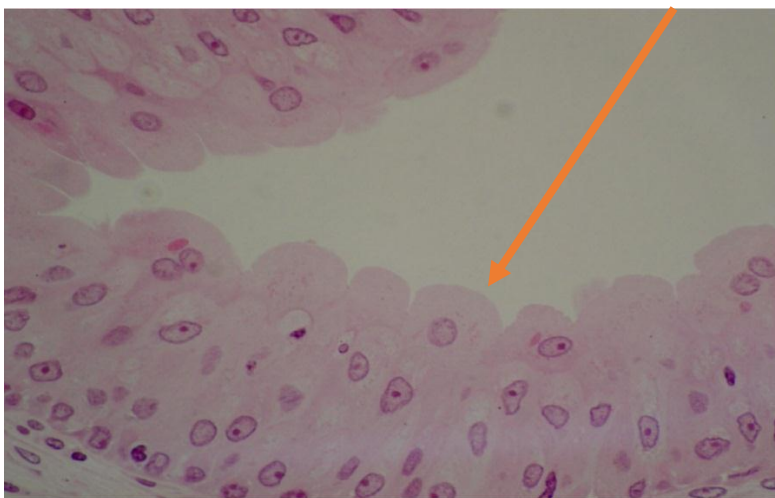
(the cytoplasm above & around the nucleus is almost significant)



Colored arrow → pseudo stratified columnar epithelium ciliated with goblet cells.

Those features are the most important to diagnose and identify the type.

There is no mobile cells in epithelium tissue.



The section from urinary bladder.

Orange arrow → transitional epithelium (urothelium).

(The superficial cells are umbrella cells which have Dom-shape → sign of urothelium)

This epithelium is stretchable.

Some umbrella cells could have 2 nuclei.

Time is 31:00



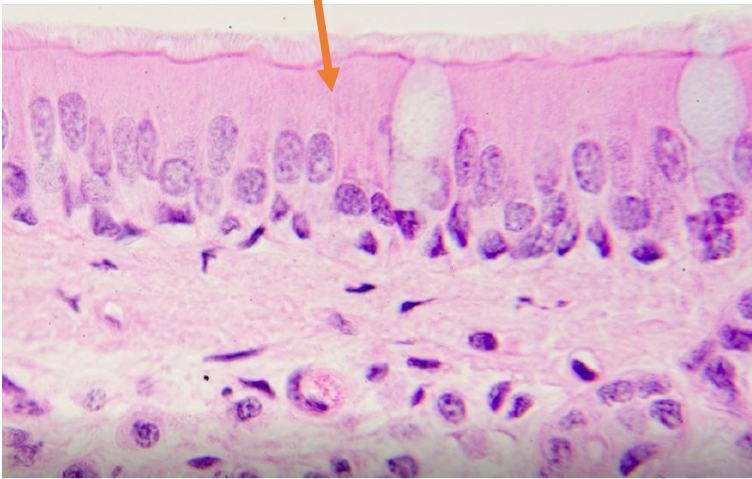
Orange arrow → stratified columnar epithelium.

(Stratified → 2 layers of nuclei)

(columnar → there is more cytoplasm above the nucleus.)

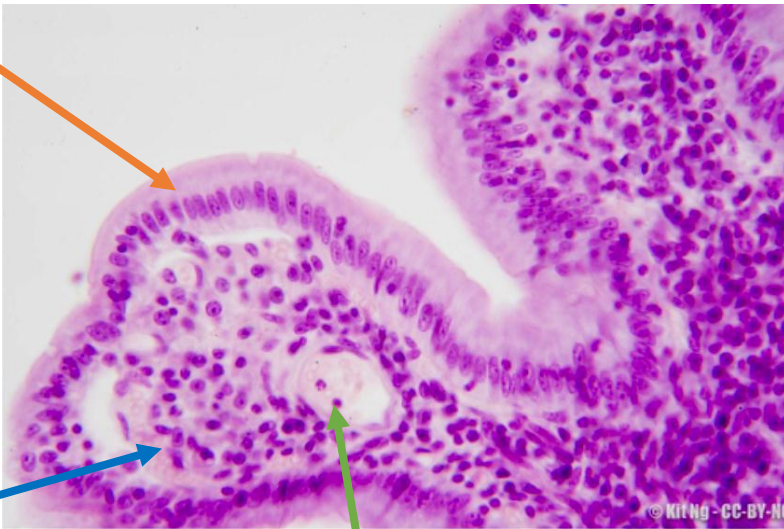
Blue arrow → endothelium

Green arrow → capillary



Orange arrow → pseudo stratified columnar epithelium ciliated with goblet cells.

Epithelium is homogenous.



The section is from gastro intestinal tract (GIT) which has a lot of cells.

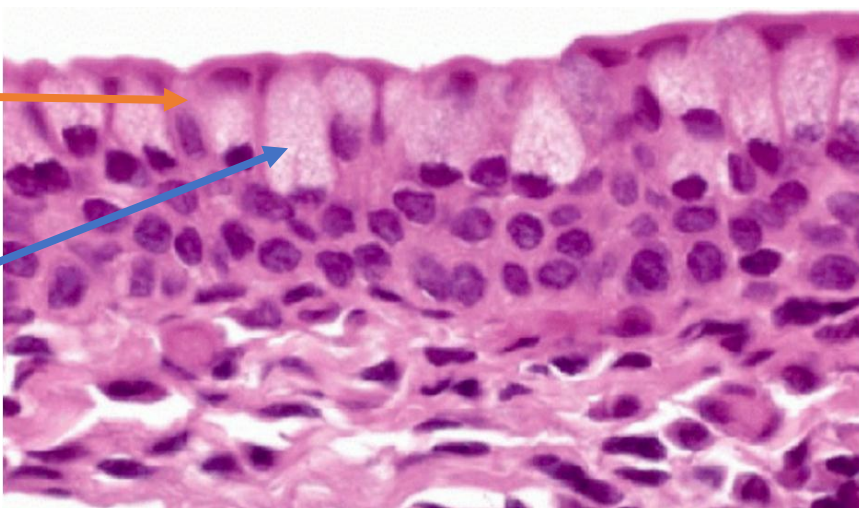
Orange arrow → simple columnar epithelium.

(columnar → a lot of cytoplasm above the nucleus)

Blue arrow → lamina propria.

Green arrow → endothelium

Mesothelium covering outside the organ



The section is from the conjunctiva.

Colored arrows → stratified columnar epithelium with goblet cells.

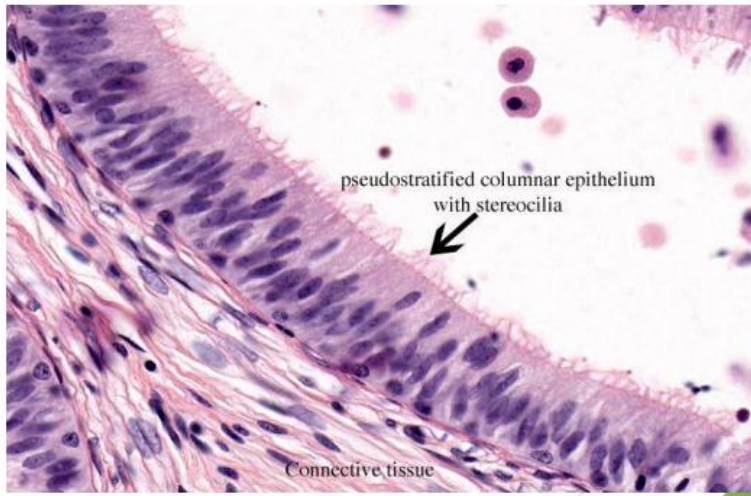
(it's not pseudo stratified because of:

No cilia here & there is layers of nuclei.)

Goblet cells release mucus to keep the eye as wet as possible.

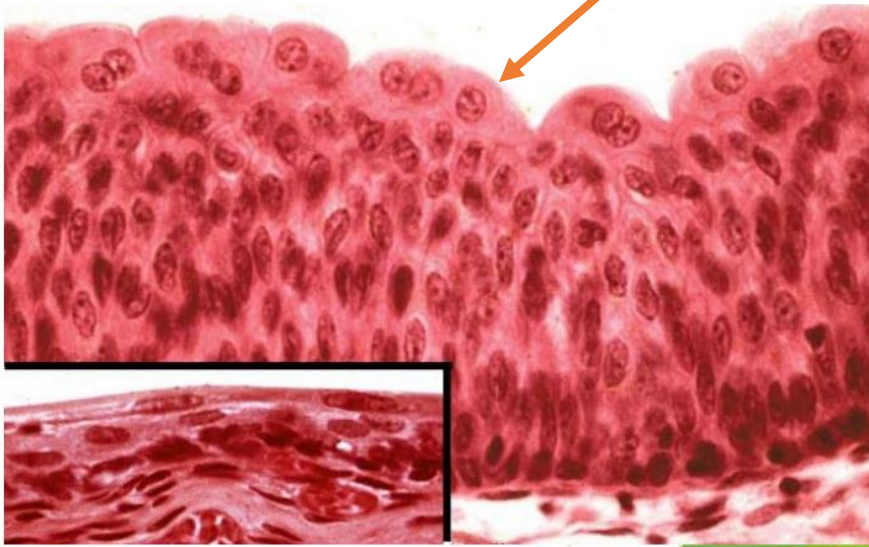


# Pseudostratified columnar epithelium with stereocilia



This section is from epididymis.

Un-stretched



Stretched



# The Golden Sheet

## How to distinguish the different epithelium tissues:

- 1 layer of nucleus → simple (divides according to the shape of the cell itself)
- Multilayers of nuclei → stratified (divides according to the shape of the superficial cells)
- Layers of nuclei, but every cell reach to the basement membrane, also ciliated & combine with goblet cells → pseudo stratified columnar epithelium ciliated with goblet cells. (Goblet cells have white color)
- Umbrella cells which have Dom-shape + multilayers of nuclei+ some cells have 2 nuclei → transitional epithelium.

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- Squamous epithelium → spindle shape (or like fried egg) of the cell, flattened (spindle) nucleus, too small cytoplasm and small volume.
  - Stratified squamous can be:
    - a. Keratinized: has pink layer without any nuclei above squamous layer
    - b. Non-keratinized: the superficial layer has nuclei.
  - Cuboidal epithelium → cubed shape of the cell, almost spherical nucleus and almost equal amount of cytoplasm above, under and around the nucleus.
  - Columnar epithelium → a lot of cytoplasm above the cytoplasm, elongated shape of nucleus, it's the biggest one but it doesn't have standard volume. (differ from organ to organ)
  - It can have some modifications like:
    - a. Microvilli: has finger like shape.
    - b. Cilia: has shape like brush board.

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- Mesothelium (covers the outside of organ)
  - Endothelium (simple squamous epithelium lines blood vessels), (you can see red blood cells & white blood cells in it)