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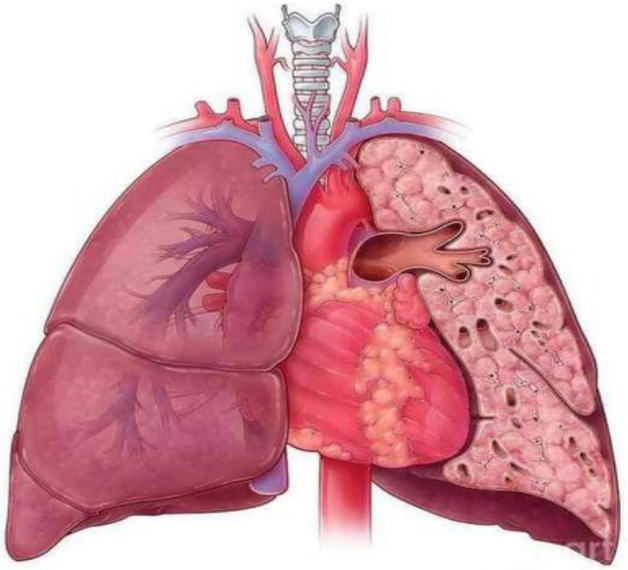
لجان الدُّفعات



Soul Academy

تفريغ أناتومي

موضوع المحاضرة: **ANS**

رقم المحاضرة : **6**

إعداد الصيدلانيه : **Aya & Heba**

محاضرة الأحد ، ٢٩/ ١٠/ ٢٠٢٣ ♡

مـــراجعـــة ؛

بالمحاضرة السابقة اخدنا عن الـ CNS والـ PNS انه بنقسم

- spinal nerve: عددها 31 pairs وطالعة من الـ spinal cord
- cranial nerve: عددها 12 وبتكون طالعة من الـ brain

PNS
- nerve
- Ganglia
- sensory receptor

اليوم رح نحكي عن الـ Autonomic ؛ (inconsciously)

- Sympathatic
  - preganglionic → Ach
  - post-ganglionic → NE (except sweet gland)
- Parasympathatic
  - pre → Ach
  - post → Ach

اللهم استعملنا
ولا تستبدلنا ♡

Soul Academy

Heba & Aya

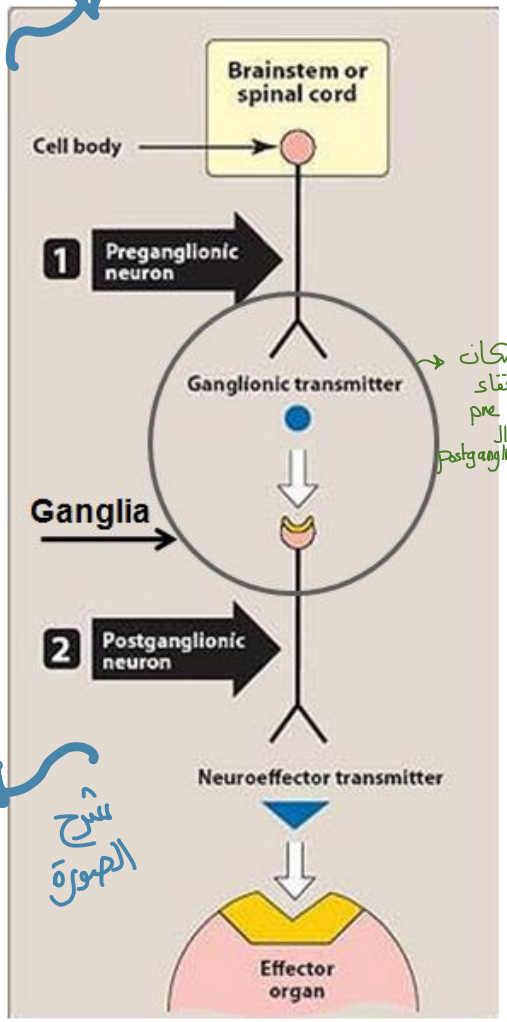
The Autonomic Nervous system

يقسم الـ PNS إلى 3 أقسام :
1. Somatic (skeletal muscle)
2. Autonomic (cardiac, smooth & gland)
3. entric (GI)

- The autonomic nervous system (ANS) is part of the peripheral nervous system. It operates unconsciously to control involuntary muscles (cardiac and smooth) and glands. It's formed of two divisions: The Sympathetic and Parasympathetic.
- The ANS is formed of Preganglionic and Postganglionic fibers. The preganglionic fibers arise from autonomic centers in the CNS and pass through cranial and spinal nerves to autonomic ganglia outside the CNS. The postganglionic fibers arise from the autonomic ganglia to supply the involuntary muscles and glands.
- The autonomic centers are controlled by the ***Hypothalamus.***

1. Hormone
2. eating
3. temprature

* إذا كان التقاء الـ pre مع الـ post بال CNS nuclei
بال PNS ganglia



مكان التقاء الـ pre مع الـ postganglionic

شرح الصورة

Fig.22: The two-neuron pathway of the ANS.

The Sympathetic (Thoracolumbar) Division

- The gray matter of the ***T1-L2 segments*** of the spinal cord possess a ***lateral horn*** in which are located the cell bodies of the sympathetic preganglionic neurons.
- The myelinated axons of these neurons leave the spinal cord through the anterior root of the spinal nerves.
- They pass through the white ramus to enter the sympathetic trunk.
  - *Sympathetic trunk* is a chain of ganglia located on each side of the vertebral column.

Internal features of the spinal cord

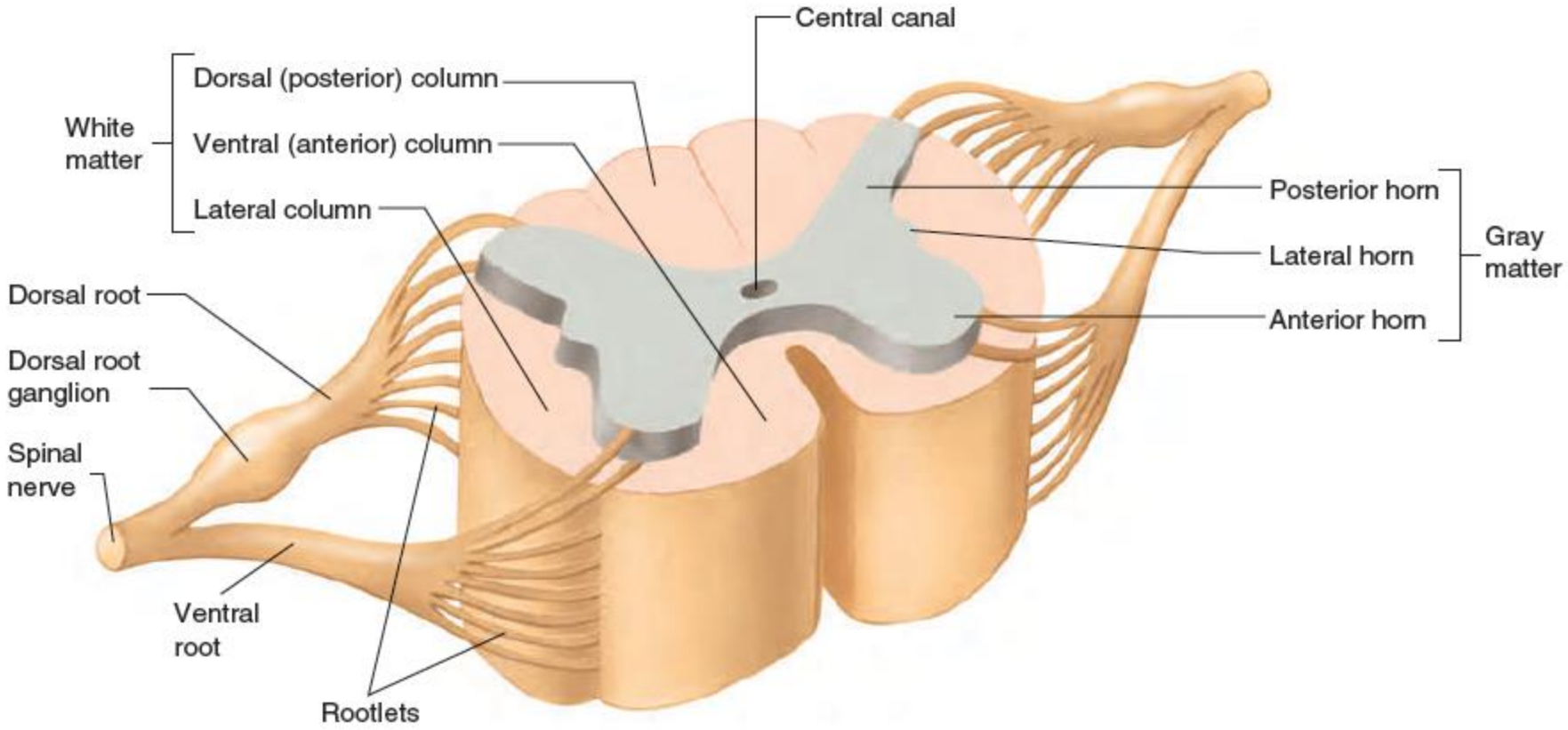


Fig.20*: Cross section through the spinal cord showing important internal features.

- In the sympathetic trunk, the preganglionic neuron may either:
  1. *Synapse* with the postganglionic neurons in the ganglia at the *same level* on the same side. In this case, the unmyelinated postganglionic fibers exit the trunk through the gray ramus to re-enter the spinal nerves where they pass to supply the smooth muscles of blood vessels, sweat glands, and the arrector pili muscles of the skin.
  2. Pass up/down in the sympathetic trunk to *synapse* with postganglionic neurons at a *different level* to supply skin.

  → Some postganglionic fibers will supply various organs in the head, chest, abdomen and pelvis.
  3. *Leave* the trunk *without synapsing*. Here preganglionic fibers will form the Splanchnic nerves and they will eventually synapse with postganglionic neurons in the preaortic ganglia (celiac, superior mesenteric, inferior mesenteric and renal). The postganglinic fibers will then pass to supply the viscera.

حالات توزيع الـ Sympathetic كيف يرتبط الـ pre ganglionic مع الـ post ganglionic

at same Level

pre ganglionic fiber ما يطلع الـ بالعمود قدامه يرسل post ganglionic براحة ach

supply: 1 smooth muscles blood vessels
2 sweat glands
3 pili muscles of the skin

up/down (different Level)

pre ganglionic fibar الـ مع يطلع لفوق أو لتحت

بغذي للعضلات

supply: skin head, chest abdomen pelvis

without Synapsing

pre ganglionic fibar الـ

مع يضل طالع لفوق

وما يرتبط بـ post ganglionics الموجودة بالـ preaortic ganglia (celiac, superior inferior mesenteric renal)

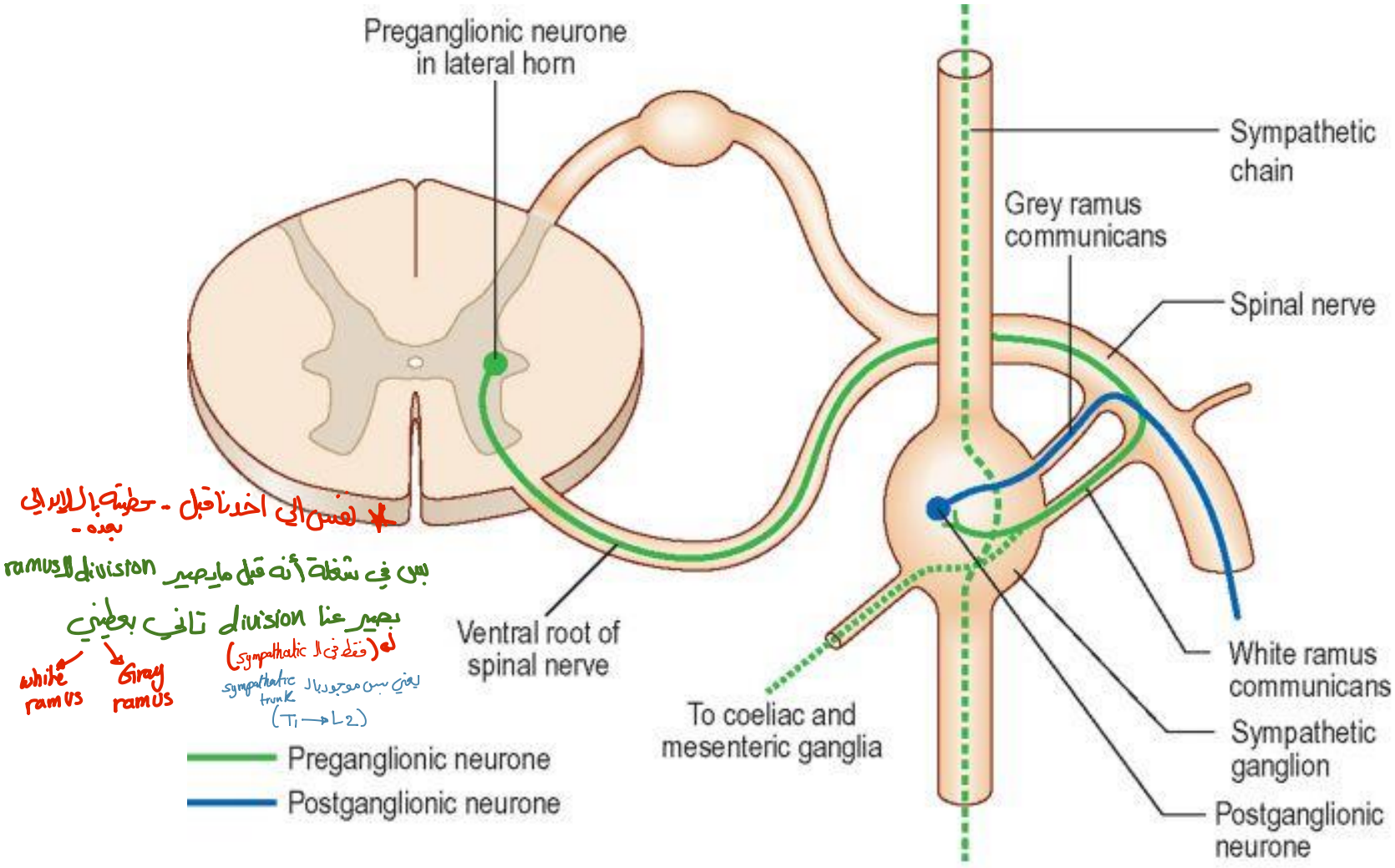


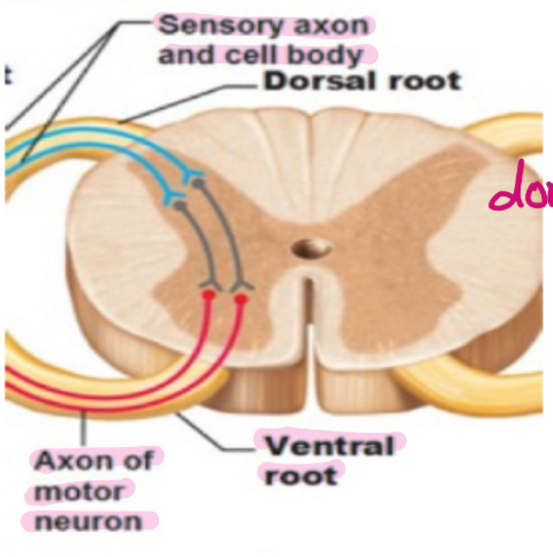
Fig.23: The pathway of the sympathetic neurons.

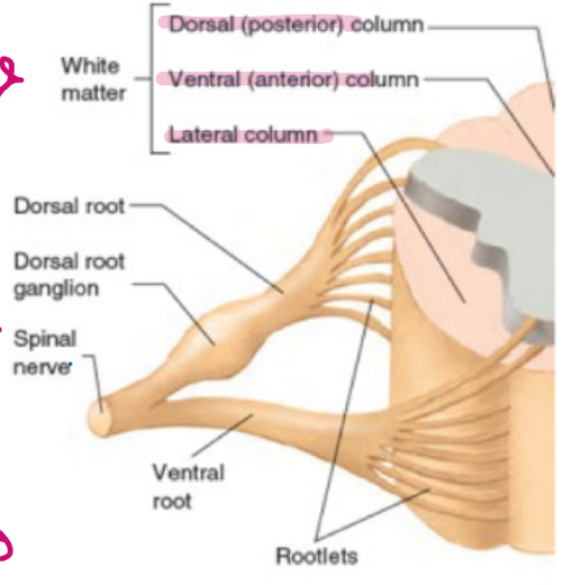
هسه أنا بعرف انه الـ spinal nerve بطلع من الـ spinal cord
و الـ spinal nerves اللي في الـ PNS بطلع منه sensory & motor neurons

* بس السؤال من وين بطلعوا؟؟

عا أجزاء الـ spinal cord اللي بالصورة
سواء إذا كانت dorsal or ventral بطلع منها:

* من كل جزء بطلع من الـ spinal cord، 2 sensory & motor
dorsal اسمه الأقرب للظهر، واحد أقرب للبطن اسمه ventral
2 sensory بطلع منه
والثاني أقرب للبطن اسمه ventral، بطلع
منه 2 motor. وبحير اسمهم ←
ventral root & dorsal root



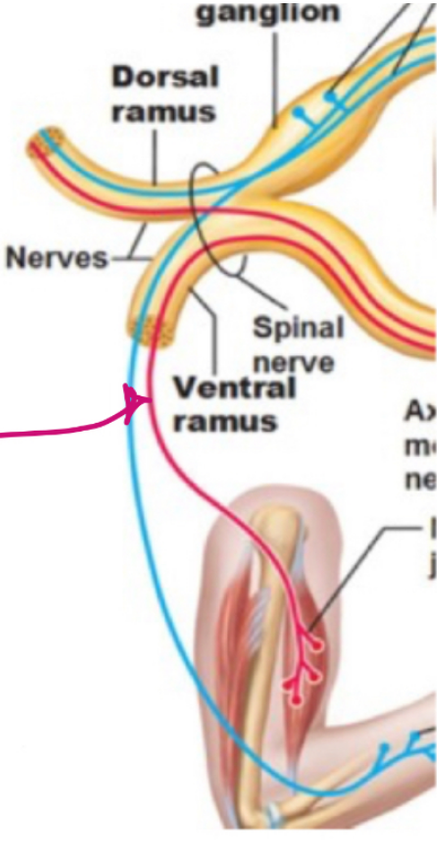


ventral root & dorsal root ال

بلتقوا سبكان اسمه spinal nerve

بعدين برجعوا بتفرقوا وبصيرا سم كل واحد

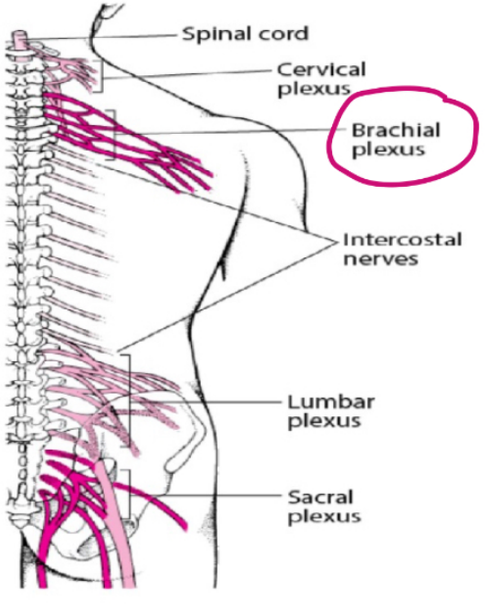
ventral or dorsal ramus



sensory & motor وبكونوا كل وحدة

sensory & Motor لما يصير عنا تشابك بال

بصير اسمه plexus



The Parasympathetic Division

- Also called Craniosacral division.
- Preganglionic neurons pass through:
  - The cranial nerves III, VII, IX and X
  - Sacral spinal nerves S2-S4 (form the Pelvic Splanchnic nerves)
- A preganglionic neuron usually synapses with 4-5 postganglionic neurons all of which supply a single visceral effector. So the effect is limited.

General and Special Sensations

نربطه بال skin تقريبا لانها كل خصائص ال skin
انه بحس باللمس والحرارة بغطي العضيات وبكون
موجود بكل مكان وبسيط التركيب

General and Special Senses

General Senses

- Include:
  - Somatic sensations (tactile, thermal, pain, and proprioceptive – sense of position) from body and joints
  - Visceral sensations from the organs.
- Scattered throughout the body.
- Simple structures.

Special Senses

هو بكون متخصص للحواس

- Include
  - Smell
  - Taste
  - Vision
  - Hearing and equilibrium.
- Concentrated in specific locations in the head.
- Anatomically distinct structures.
- Complex neural pathway.

The General Sensory Structures

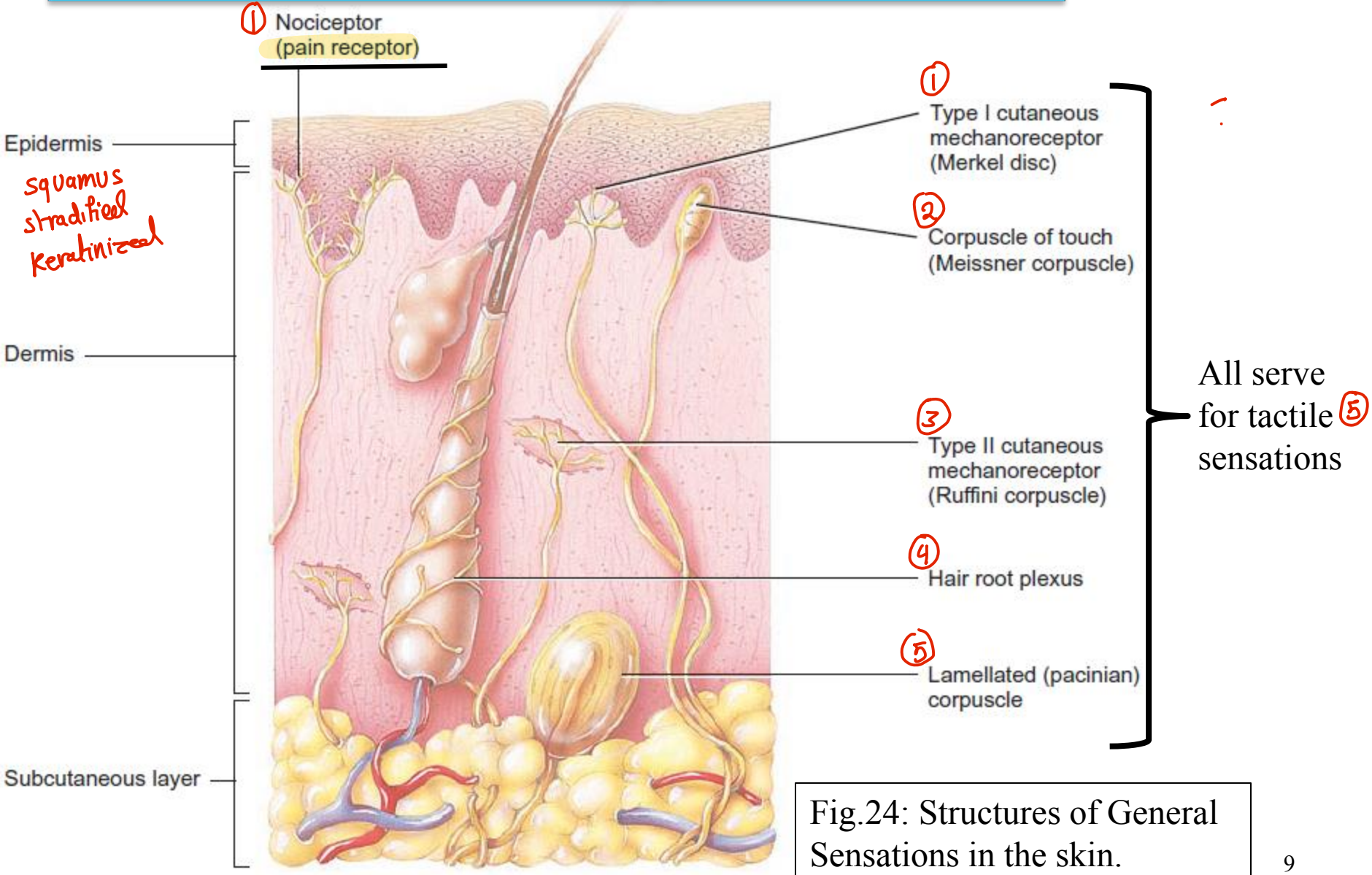


Fig.24: Structures of General Sensations in the skin.

Special Senses – Olfaction = Smell

- The olfactory epithelium is located in the roof of the nasal cavity.

- The olfactory epithelium is formed of:

1. ***Olfactory receptors*** bipolar neurons with cilia called olfactory hairs.
2. ***Supporting cells***- provide support and nourishment.
3. ***Basal cells***- replace olfactory receptors.

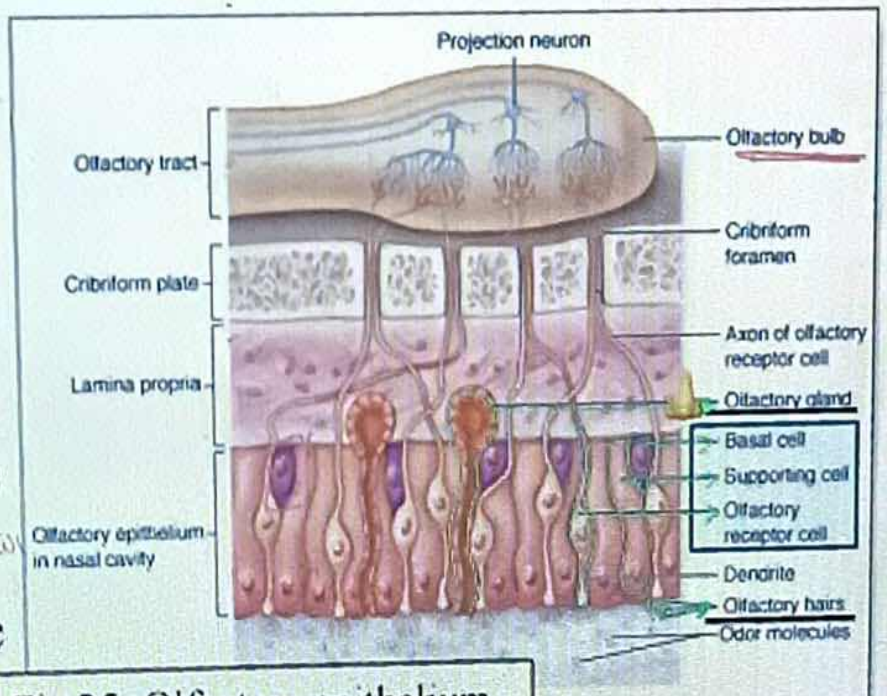


Fig.25: Olfactory epithelium.

- Olfactory glands produce a secretion that helps in moistening the surface of the epithelium

Special Senses – Gustation = Taste

- Gustation is performed by specialized structures called ***Taste Buds*** that are mainly present in the papillae of the tongue.

داخل اللسان

- Taste buds are oval structures formed of:

1. ***Gustatory cells***- Each one has a gustatory hair (a long microvillus) that projects through an opening in the bud called the taste pore.

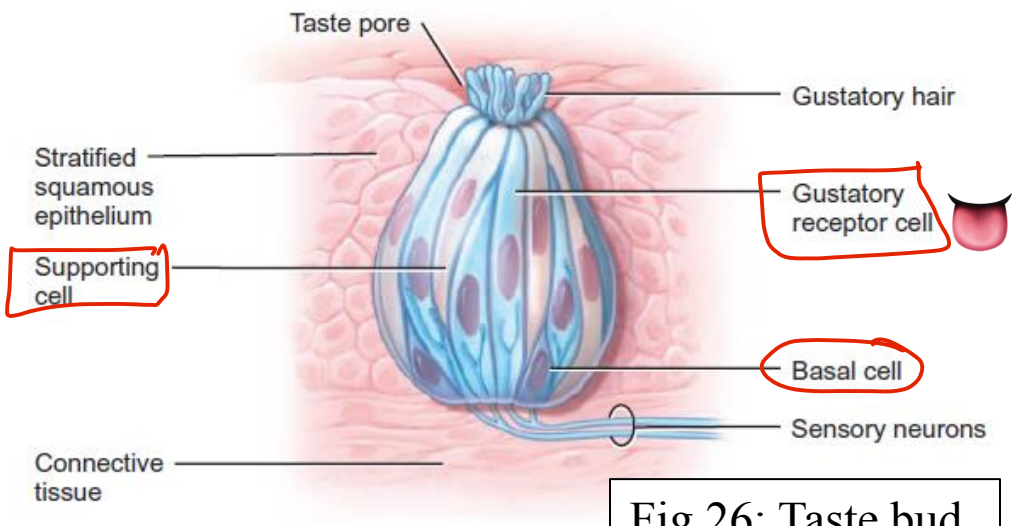


Fig.26: Taste bud.

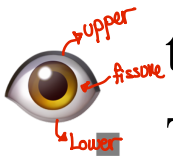
2. ***Supporting cells***- provide support and nourishment.
3. ***Basal cells***- replace the other cells.

small instant (الأطعمة الدسمة) هاي موقسرت الموجودة بالـ
microvillus تعتبر صيك، حشان تكن أطول microvillus بتشبه الـ

Special Senses – Vision

- Vision is the function of the eye.
- The eyeball is located in the orbital cavity of the skull. (3,4,6)
- Accessory structures of the eye include:
  1. The eyelids جفون
  2. The lacrimal apparatus دمعي
  3. The extrinsic muscles of the eye عضلات العين الخارجية

- The two eyelids (palpebrae) جفن (1)protect eye from light, (2)shade eye during sleep, and (3)spread tear دمعة.
- The space between the eyelids that exposes the eyeball is called the ***palpebral fissure***.



- The ***levator palpebrae superioris*** رافعة muscle raises the upper eyelid.

The muscle responsible for opening the upper eyelid.

The Lacrimal Apparatus

~important for exam

FLOW OF TEARS

Lacrimal gland

↓

Lacrimal ducts

↓

Superior or inferior lacrimal canal

↓

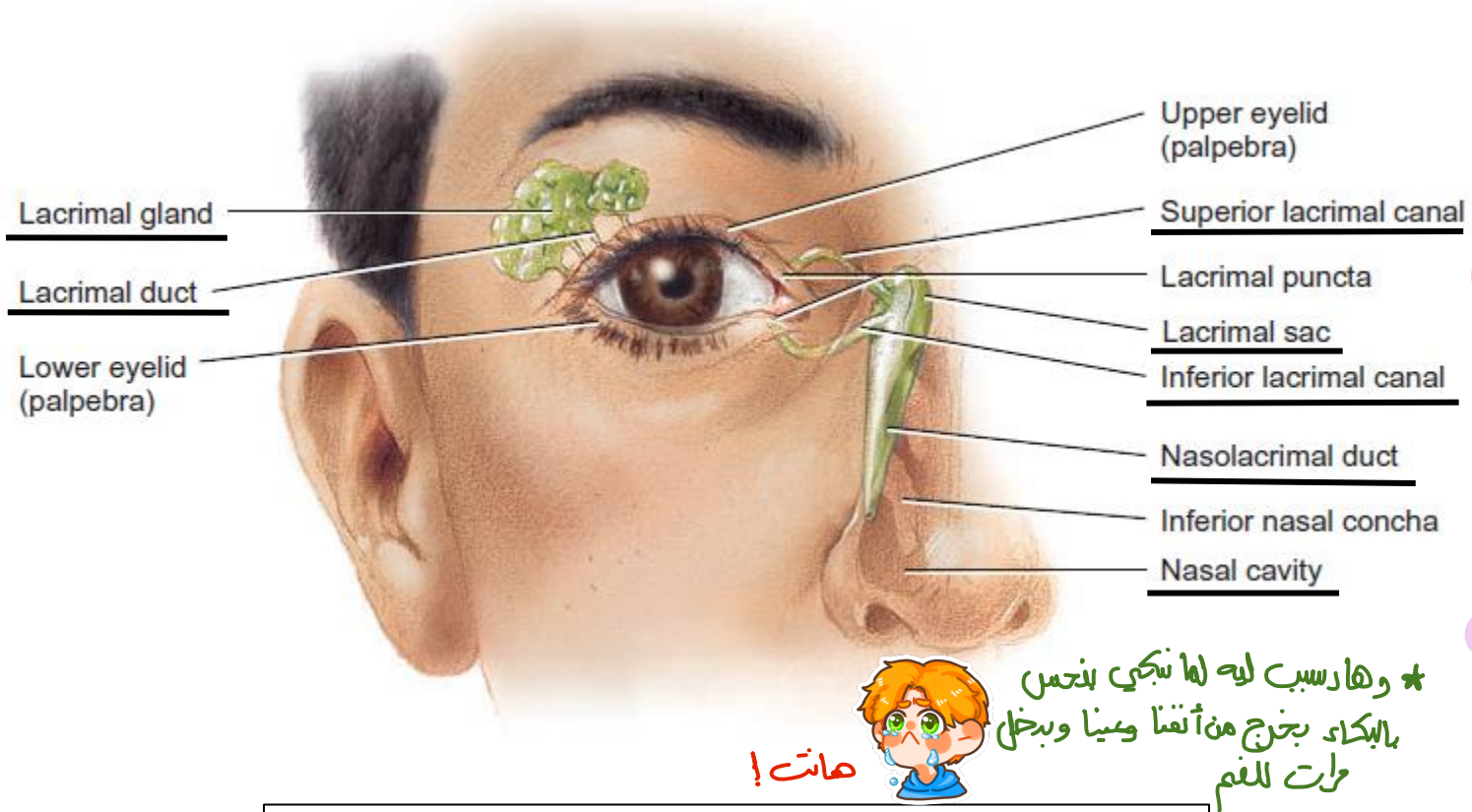
Lacrimal sac

↓

Nasolacrimal duct

↓

Nasal cavity



هانت !

* وهادسبب لي لما نبكي بنحس بالبكاء بخرج من أنفنا وعينا وبدخل مرات للفم

Fig.27*: Components of the lacrimal apparatus.

التي تحيط بالعين Extrinsic Eye Muscles

- Six **extrinsic** eye muscles control movements of each eyeball. They are called extrinsic because they originate outside the eyeball in the bony orbit and insert on the outer surface of the sclera. These muscles are supplied by cranial nerve III, IV, and VI.

3 4 6

عدا عظمي

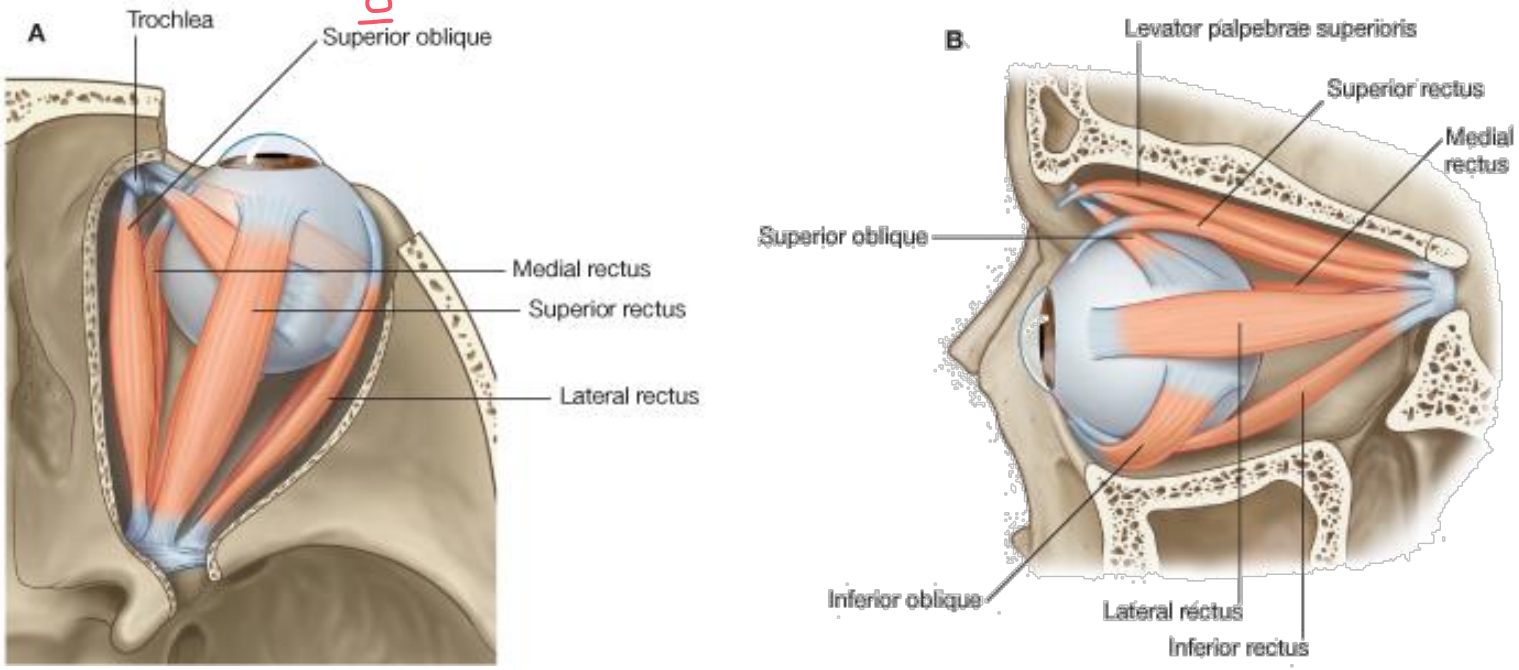


Fig.28: Extrinsic muscles of the eye. (A) superior view. (B) lateral view.

Anatomy of the Eyeball

The Wall of the eyeball

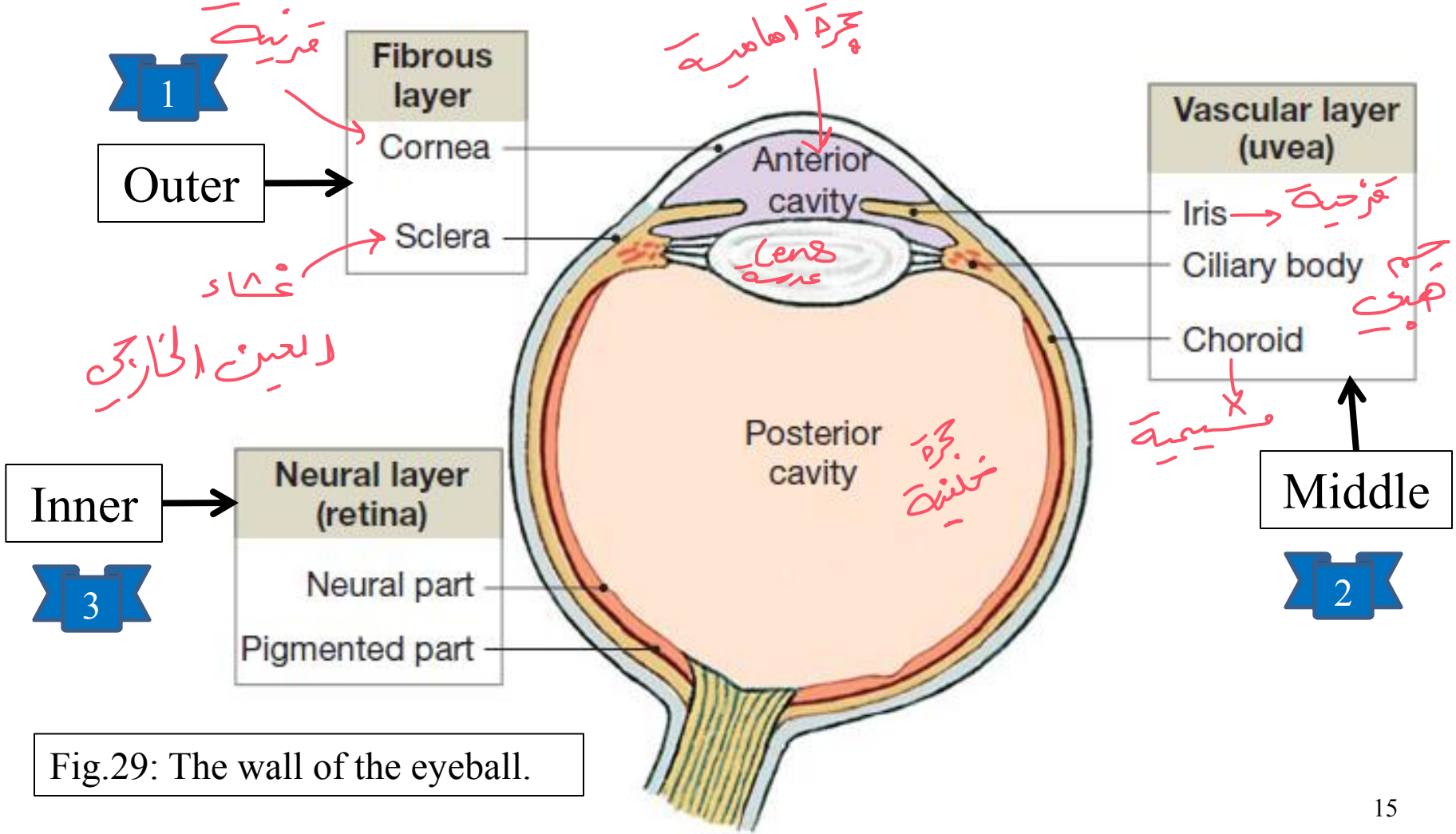


Fig.29: The wall of the eyeball.

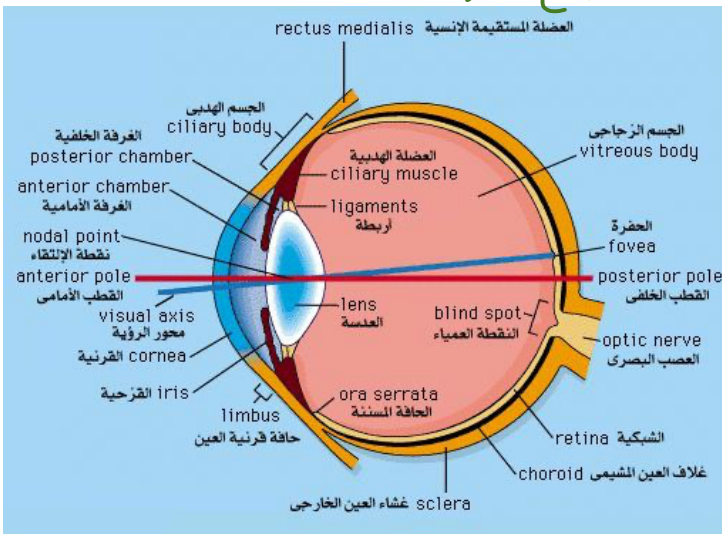
1. Fibrous tunic (layer)

الجزء الخلفي اللي بيرتبط بالـ extrinsic eye muscles

a) Sclera "white" of the eye

- The larger posterior part.
- A strong fibrous layer.
- Functions:
  1. Protect the eye.
  2. Help maintain shape of the eye.
  3. Site of attachment of extrinsic eye muscles.

- توضيح المعاني باللغة العربية -



b) Cornea القرنية

- The smaller anterior part. Located in front of the iris. القزحية
- Transparent. شفافة
- Function: it allows light to enter the eye and it's the major refractory structure in the eye.

الجزء الأمامي transparent يكون عشان يسمح لمرور الـ light من خلاله

2. *Vascular tunic*

تتكون بالجزء الخلفي للعين ويكون فيها أوعية دموية كثير ليش؟!
عشان تنقل الغذاء لـ retina وفيها صبغة الميلانين عشان تمتص الضوء

a) Choroid

- The large posterior part. It's highly vascular layer with numerous melanin-producing melanocytes.
- Functions: (1)supply nutrients to the retina, (2)melanin pigment absorbs any stray lights, thus, making the image sharp.

b) Ciliary body

الجسم الهدبي

posterior لـ تكون
cornea, sclera

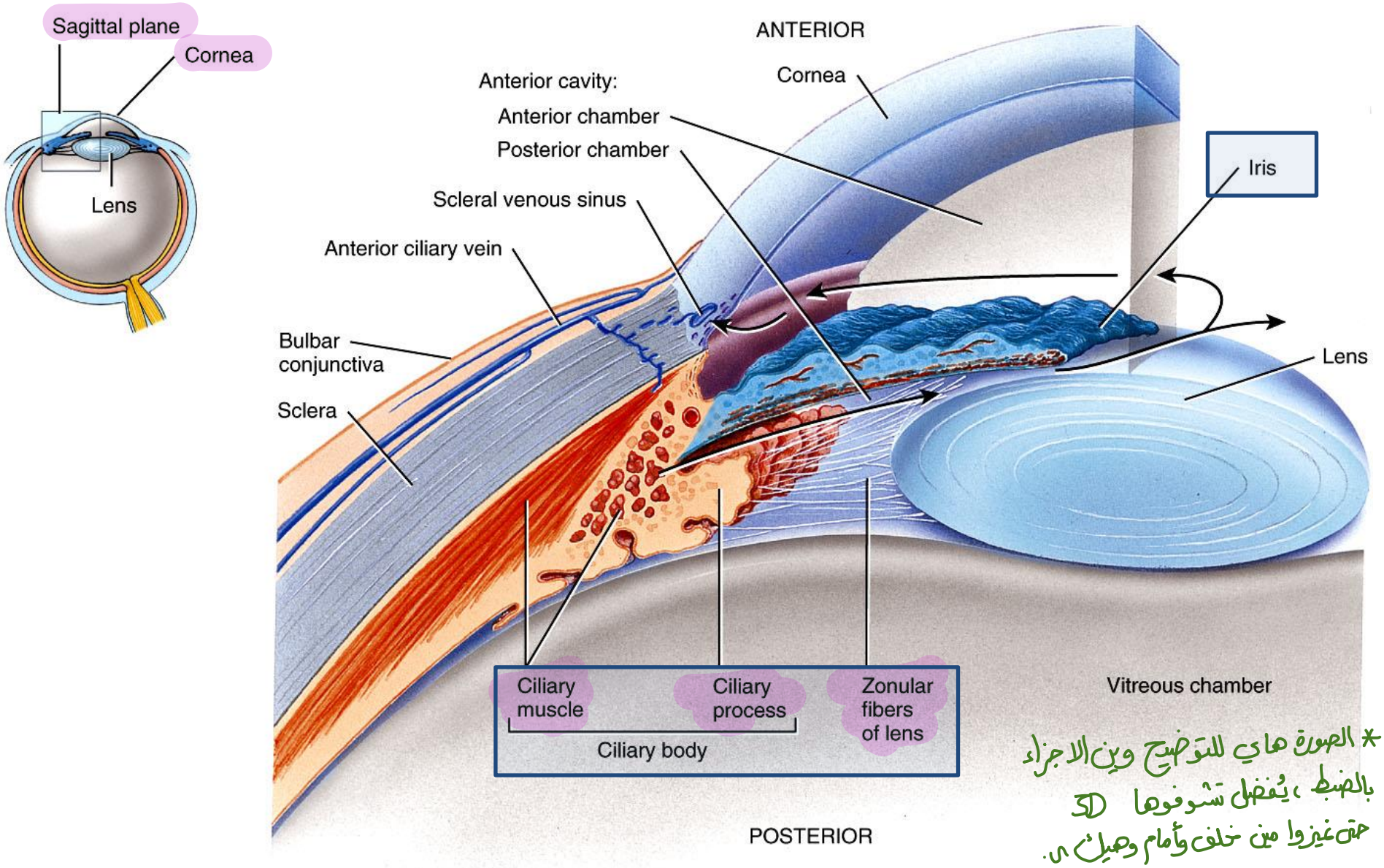
- The middle part of the vascular tunic.
- Located just posterior to the junction of the cornea and sclera.
- Has numerous protrusions called the ***ciliary processess***. These produce the aqueous humor. From them extend the ***zonular fibers*** (suspensory ligaments) that are attached to the lens.

يحافظ على ضغط العين

يمسك

- The ***ciliary muscle*** is a smooth muscle within the ciliary body. It's responsible for changing the shape of the lens.

بوبع العدسة



* الصورة هاي للتوضيح وين الاجزاء بالضبط ، يُفضل تشوفوها 3D حتى تميزوا من خلف وأمام وهيك ..

Fig.30: The ciliary body and the iris.

- طول بالك حفايل سلايدين -

c) The Iris

- The anterior colored portion of the vascular tunic.
- The opening in the middle of the iris is called the ***pupil***. Through this pupil light can pass to the lens.

- The iris contains the circular ***sphincter pupillae muscle*** and the radial ***dilator pupillae muscle***. These muscles change the diameter of the pupil regulating the amount of light passing through it.

دائري عشان يضيق
وطولي عشان يوسع

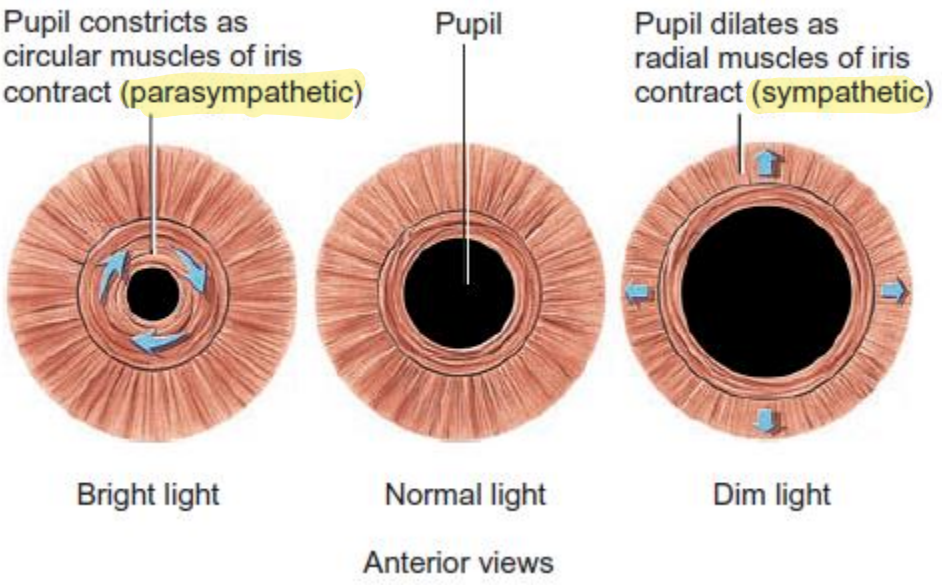
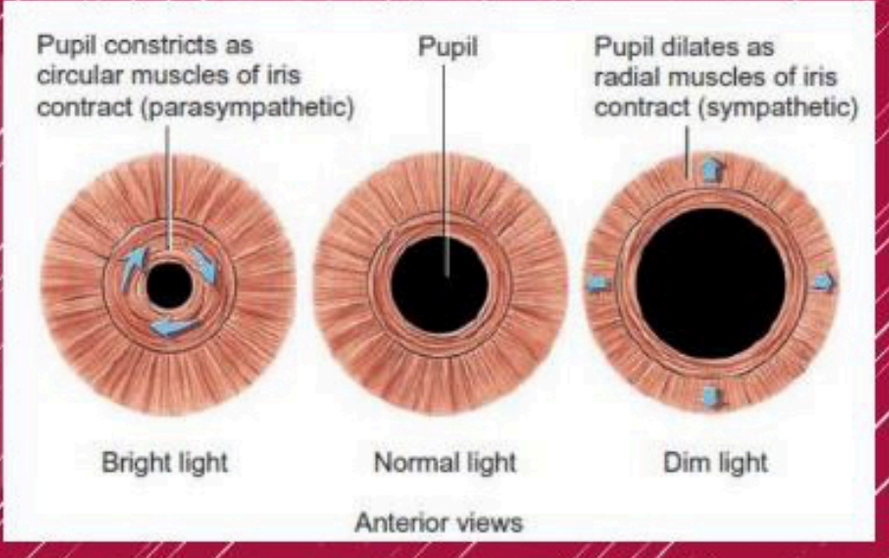


Fig.31*: The muscles of the iris. Note the effect of the two divisions of the ANS on them.

معلومة بس
كما يموت الشخص بوجه الطبيب الضوء على عينه حتى يعرفوا إذا مات ((لأنه بؤبؤ العين ما بوسع ولا بضيق دلالة على موت CNS وبالتالي موت الشخص

* ملخص 8 ج

iris



sphincterpupillaemuscle	circular	contract	parasympathatic	bright light
dilatorpupillae muscle	radial	dilates	sympathetic	dim lght

بالتوفيق يا رب، وما تنسونا
من صالح دعائكم💙💙

.