ENDOCRINE

ANATOMY

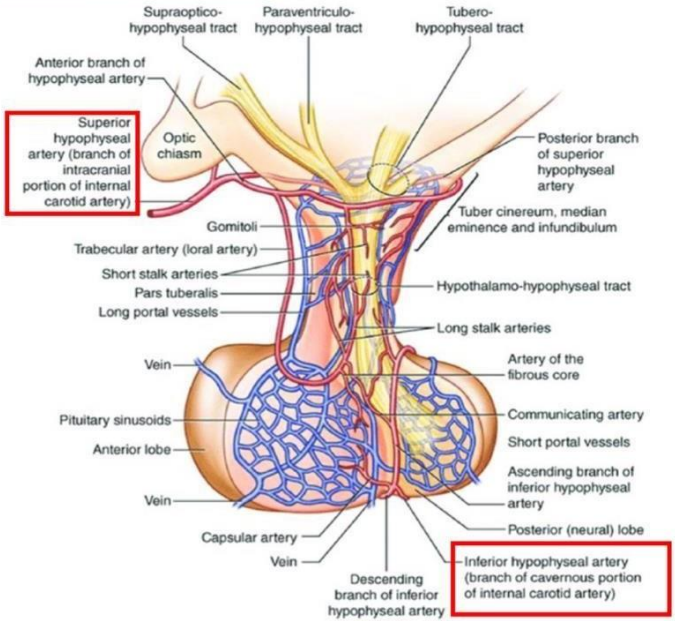
#2

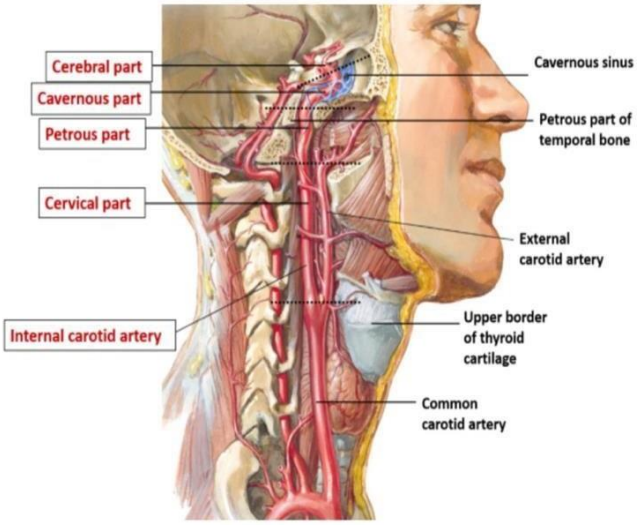
WRITER: **Group member**

COR RECTOR: **Your Name**

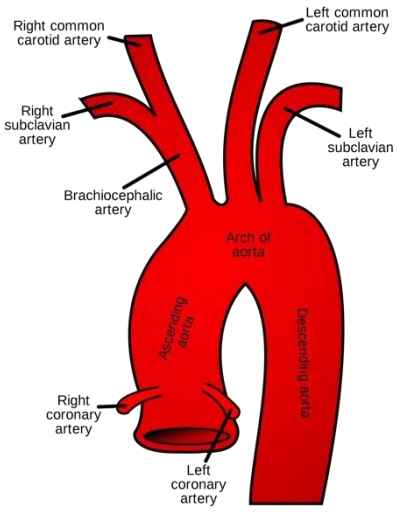
DOCTOR: **Dr. Ghada Name**

Blood supply





Where does it come from? The internal carotid artery which comes from the common carotid artery, the common carotid comes from the arch of the aorta (the left side), in the right side the common carotid comes from the brachiocephalic artery. Look at the picture (only for explaining).



Eventually the common carotid will divide into internal and external, the internal will supply the cranial cavity (one of the suppliers, not the only).

Look at the pic above we have the superior and inferior hypophyseal arteries.

The superior hypophyseal artery will give rise to many branches one of them such as the posterior and anterior branches and they will circle around the

lowest part of the hypothalamus (median eminence) and there the hormones managing happens.

The hypothalamo-hypophyseal portal system

Superior hypophyseal artery

↓

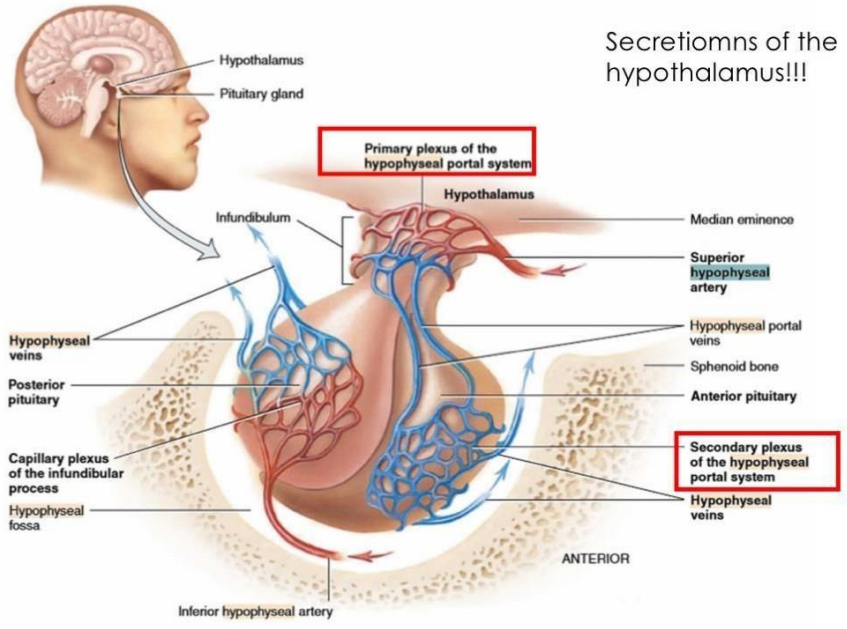
Primary plexus (capillaries)

↓

Hypophyseal portal viens

↓

Secondary plexus (capillaries)



Secretiomns of the hypothalamus!!!

NOTE : THE CAPILLARIES ARE ACTUALLY INSIDE THE PITUITARY (UNLIKE THE PIC UPOVE), IT LOOKS THIS WAY IN THE PIC ONLY FOR EXPLAINING

Secretions of the hypothalamus

- **to Neurohypophysis.**
  1. Hypothalamic-hypophyseal tract
  2. Supraoptic and the paraventricular Ns.
  3. Axonal transport-—pars nervousa.
  4. ADH, Oxytocin.

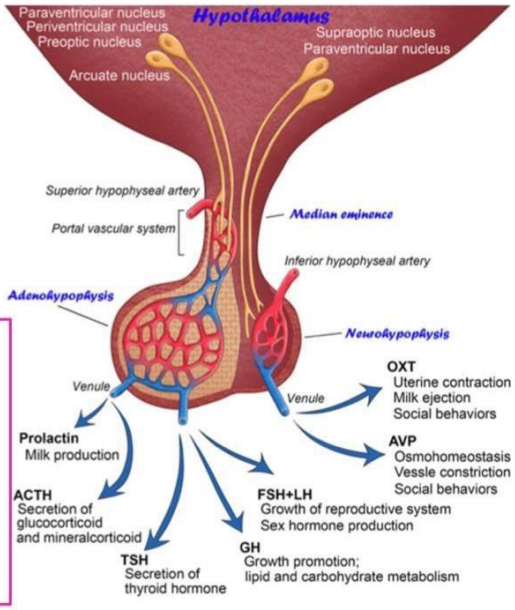
- **To Adenohypophysis**

  Rreleasing and inhibitory hormones

  The thyrotropin-releasing hormone (TRH), gonadotropin-releasing hormone (GnRH), growth hormone-releasing hormone (GHRH), corticotropin-releasing hormone (CRH).

  Prolactin inhibitory hormone (dopamine, PIH) . Growth hormone—inhibiting hormone (GHIH, somatostatin)

The hypothalamic-hypophyseal tract consists of axons extending from the hypothalamic supraoptic and paraventricular nuclei, through the infundibulum and into the pars nervosa



Portal circulation = hypothalamo-hypophyseal circulation

The two nuclei of the hypothalamus (supraoptic and

paraventricular) are in charged for making two hormones: ADH and oxytocin, they have typical neurons but slightly modified, they're larger and bigger in size, ADH and oxytocin will be delivered through the axons and will be stored in the pars nervosa, and when the nerve impulses arrive it'll be released to the blood.

Oxytocin —> breasts, uterus.
ADH —> kidney.

ADH along with oxytocin are produced in the supra optic and paraventricular nuclei of the hypothalamus. These hormones are stored in the posterior pituitary and released in response to appropriate stimuli which is transmitted by the axons in the hypothalamus-hypophyseal tract .
The second function of the hypothalamus is the production of releasing and inhibiting hormones, which stop and start the production of other hormones throughout the body mainly those in the anterior pituitary gland These releasing and inhibitory hormones must firstly reach the adenohypophysis instead of going to the systemic circulation so to achieve this the portal system is found .
In normal cases veins continue as veins but in the portal system there is an exception they branch again to form the secondary plexus to make these hormones reach the adenohypophysis first because they are found in small amounts if they reach the systemic circulation first they would be diluted .

What is portal circulation? Instead of going through the huge complexed systematic circulation, pituitary gland got its own thing, it's got capillaries then venules and then instead of bigger veins it got another set of capillaries.

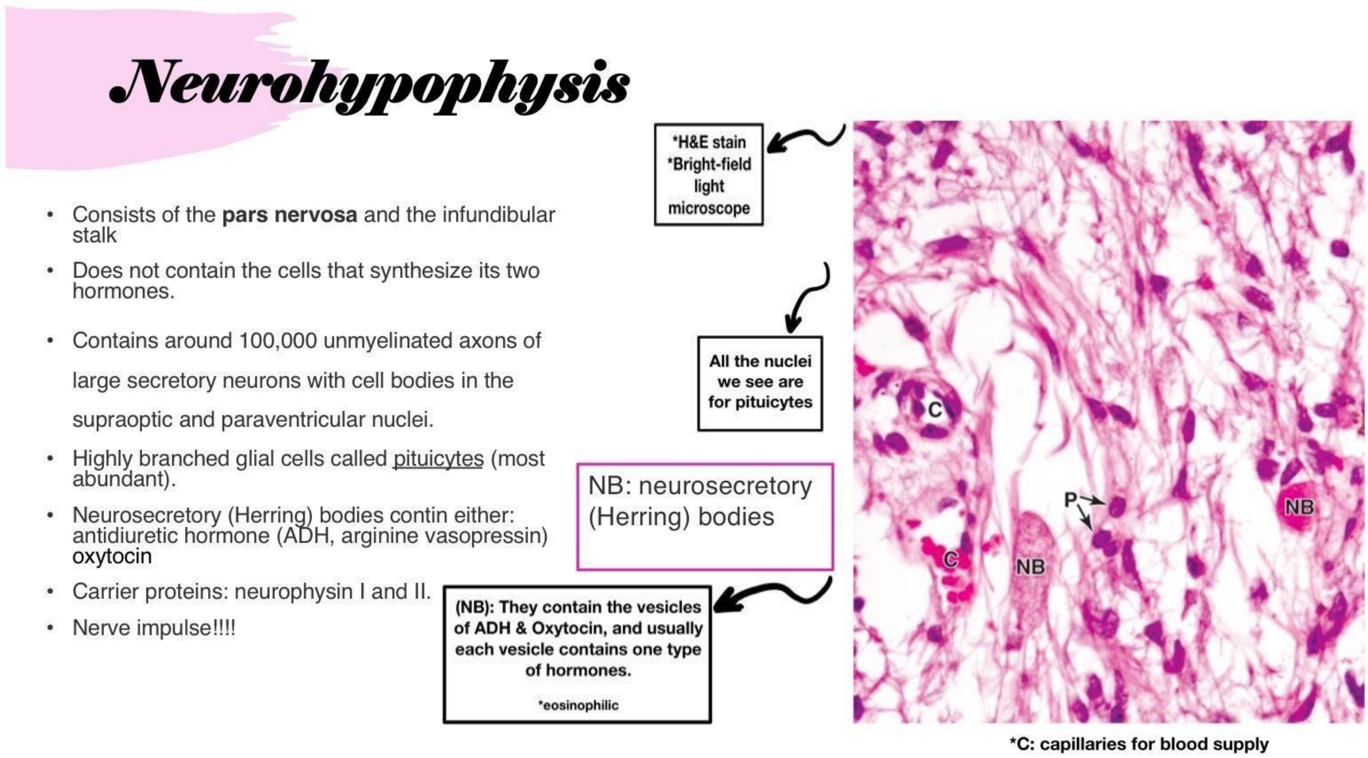
يعني ببساطة بيجي الدم من ال hypothalamus محمل بالهرمونات بيمرق ب artery بعدها capillary بيدخل ال pituitary وبيحط الي عنده (الهرمونات) بال pituitary وبيطلع للsystemic circulation هلا يسهل عليه.

فيديو قصير جميل بيشرح الموضوع في حال -ال سمح هلا- ما فهمتوا :

https://youtu.be/Mp9j5amVtSk

After all of that the other set of capillaries will form normal veins and go back to the systemic circulation as in any other normal veins (hypophyseal vein).

Portal circulation can be also found in lever and kidney, why? We can’t allow absorbed material (from the intestine) to enter the systemic circulation without checking it first in the liver, so we have a portal circulation in it.



Neurohypophysis
• Consists of the pars nervosa and the infundibular stalk
• Does not contain the cells that synthesize its two hormones.
• Contains around 100,000 unmyelinated axons of large secretory neurons with cell bodies in the supraoptic and paraventricular nuclei.
• Highly branched glial cells called pituicytes (most abundant).
• Neurosecretory (Herring) bodies contin either: antidiuretic hormone (ADH, arginine vasopressin) oxytocin
• Carrier proteins: neurophysin I and II.
• Nerve impulse!!!!
*H&E stain *Bright-field light microscope
All the nuclei we see are for pituicytes
NB: neurosecretory (Herring) bodies
(NB): They contain the vesicles of ADH & Oxytocin, and usually each vesicle contains one type of hormones.
*eosinophilic
C
C
NB
NB
P
*C: capillaries for blood supply

Neurohypophysis (posterior pituitary)

(Downgrowth of diencephalon)

(from inferior hypophyseal)

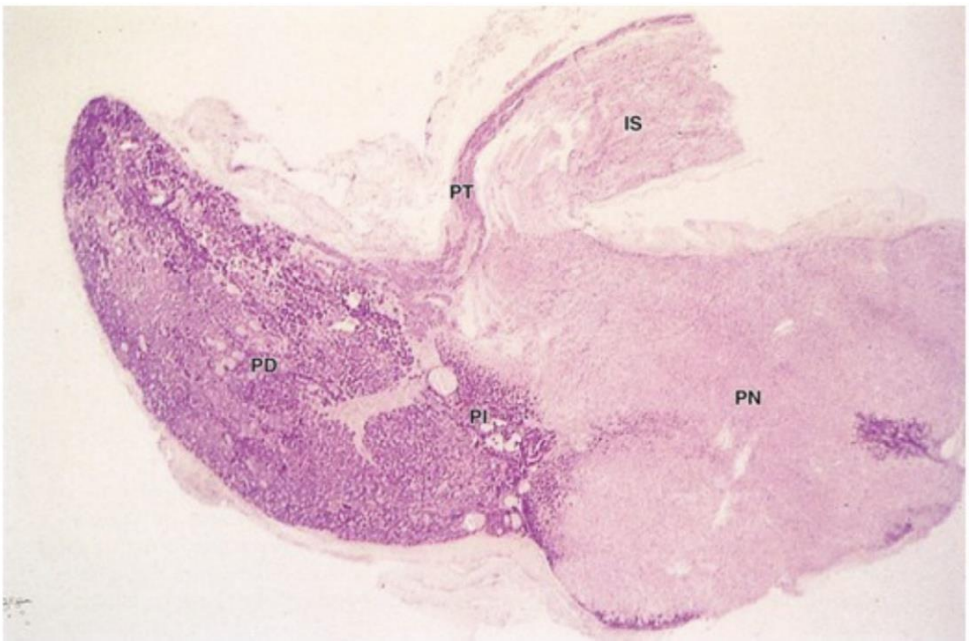
It's a typical neural tissue, but we'll not see neurons, it's actually a collection of unmyelinated axons with supporting cells (glial cells).

These supporting cells called pituicytes (they're like astrocytes), and they're only for supporting the axons (they have no role in nerve impulse or secretion function).

- supraoptic and paraventricular nuclei: they're in hypothalamus, they synthesize the two hormones (ADH & Oxytocin), and they use their axons to deliver these hormones to posterior pituitary gland.

- What really happen is that when our body needs to secrete or release ADH or oxytocin a nerve impulse will reach the receptors of hypothalamus to let the hormone go and does its function inside the body, (*the doctor says that we'll take the whole details in NERVOUS SYSTEM), so this is a combination and that's how the neurohypophysis works, contrary to adenohypophysis which is hormonal and hormonal only.

Adenohypophysis



*Anterior pituitary: typical epithelial cells which have secretory function - PD: pars distalis. - PI: pars intermedia. - PT: pars tuberalis.

*Posterior pituitary: neural tissue which contains axons, glial and capillaries - IS: Infundibular stalk. - PN: Pars nervosa.

V4

The superior hypophyseal artery will give rise to many branches one of them such as the posterior and **anterior** branches

Page 4

A paragraph with wrong info has been deleted and instead of it “ADH along with oxytocin are produced in the supra optic and paraventricular nuclei of the hypothalamus. These hormones are stored in the posterior pituitary and released in response to appropriate stimuli which is transmitted by the axons in the hypothalamus-hypophyseal tract .

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