

Physiology

What is Physiology? Is it important?

* American Physiology Society definition (APS): includes two points

It is the functions or the dynamics of parts of the body and the whole body.

Human Physiology deals with the human beings.

We are going to study physiology at all levels of:

- Sub-cellular level: sub-cellular functions or abnormalities of enzymes.
- Cellular level.
- Tissue level.
- Organ level.
- System level.

You will study Physiology in health and disease, because you are a physicians (doctor), you will see the functions and the disfunctions (pathophysiology).

Physiology is all about the dynamics, physics, mechanisms of the body,

You can not separate Physiology from Medicine (It is the mother of Medicine).

Human brain:

What is the human brain?

It is the most difficult part to study so now we will take an introduction to it then we will take it in details in the end of the 3rd year.

It is divided into three main regions:

- Brain stem - Limbic system - Cerebral cortex

Brain stem (lower brain): it is also called reptiles' brain because it is very important and responsible for vitals.

It is the oldest part of the brain, consists of three parts:

- Medulla oblongata

- Pons

- Midbrain

- We can't live without it , we can't stay alive without it and no creature can do !

It is present in the lower animals, higher animals and human beings.

Functions:

- Respiratory centre: keeps you inspiring & expiring.

- Cardiovascular centre: controls heart rate, blood pressure, circulation.

- Conscious level: Puts you to sleep at the end of the day and wakes you up in the morning. (When someone is hit on the back of his head, that puts him in a coma).

* Note: direct hit on the back of the head is the most dangerous.

Patient suffering any pathology or tumor in this region is very unlucky as it is very difficult to be reached by surgery, very difficult to be treated and a very important region.

When the patient is drowsy, confused and he doesn't know where he is, we should think of the brain stem.

When this area dies or get damaged, we call the patient "Brain-death"

(الموت الدماغى السريرى).

*On the top of this area is the:

Limbic system (The emotional brain): it is the subcortical, emotional brain

- Emotions (ex: love, hate, like, dislike, jealous...etc)
- Motivation (ex: makes you do efforts like waking up in the morning, getting dressed, going to work...etc), when it is damaged and become disfunctioned , the patient loses the initiation and the motive
- Behavior (ex: talkative, smart, liar, shy, joyful ...etc)

The emotional brain differs between males and females, it is 13% larger in females than in males, females are more emotional, more loving and caring (emotions are more intense in females than in males).

This is good for female ---- makes her more human (lower animals like spiders and reptile don't have emotions, humans are in the top of the animal kingdom pyramid, when you go up (more evolved), the emotions become more intense).

This is bad ---- makes her get more psychic disfunctions.

The last part of the brain is the:

Cerebral cortex: 70% of the brain,

it is unique in human beings, we don't see it in lower animals, even in higher animals like monkeys, cats, dogs.. it is minimal, it is highly evolved in human beings.

- Thinking, solving problems, and intelligence.

- Memory

- Speech (language): we have a unique way of communication that is not found in animals (animals need a physical communication; we don't need that physical communication to make people understand).

* The conflict between the limbic system and the cerebral cortex makes you suffer from psychological illnesses (conflict between what you like and what is supposed to be done).

* Some examples:

Anxiety قلق, Insomnia أرق, having problems unable to be solved lead to depression اكتئاب.

Dinosaur weight = 1600 kg

Dinosaur's brain weight = 0.07 kg, 0.004%

Human weight = 70 kg

Human's brain weight = 1.4 kg, 2%

That does not mean that the fleshy person is more intelligent than the skinny person, the intelligence is related to the synapses and connections in the brain (more synapses --- more evolved and intelligent).

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