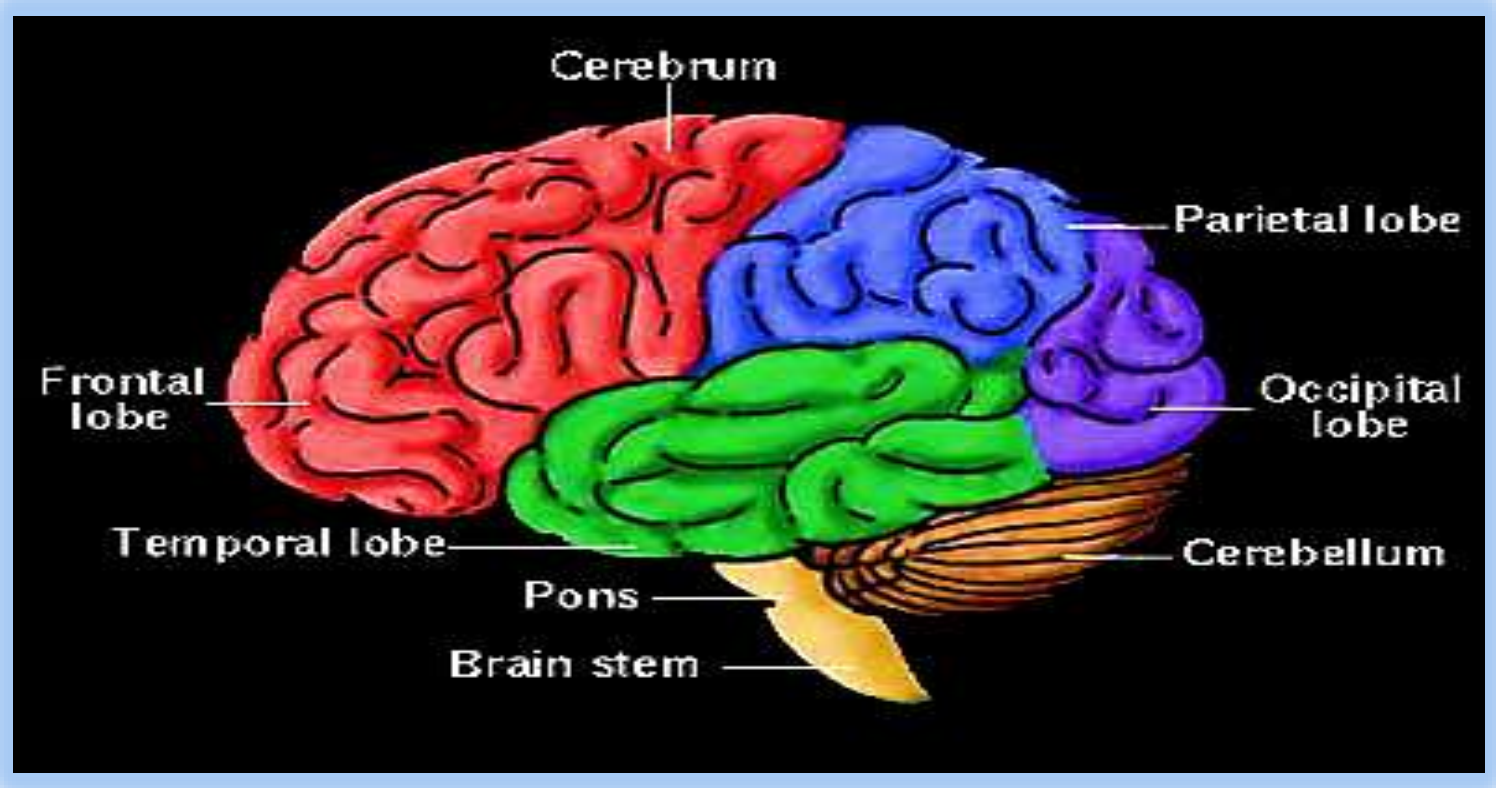
Central Regulation of Viscera



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The autonomic nervous system has:

Central part:

In brain and spinal cord

Peripheral part or autonomic fibers:

Sympathetic and parasympathetic.

Autonomic ganglia.

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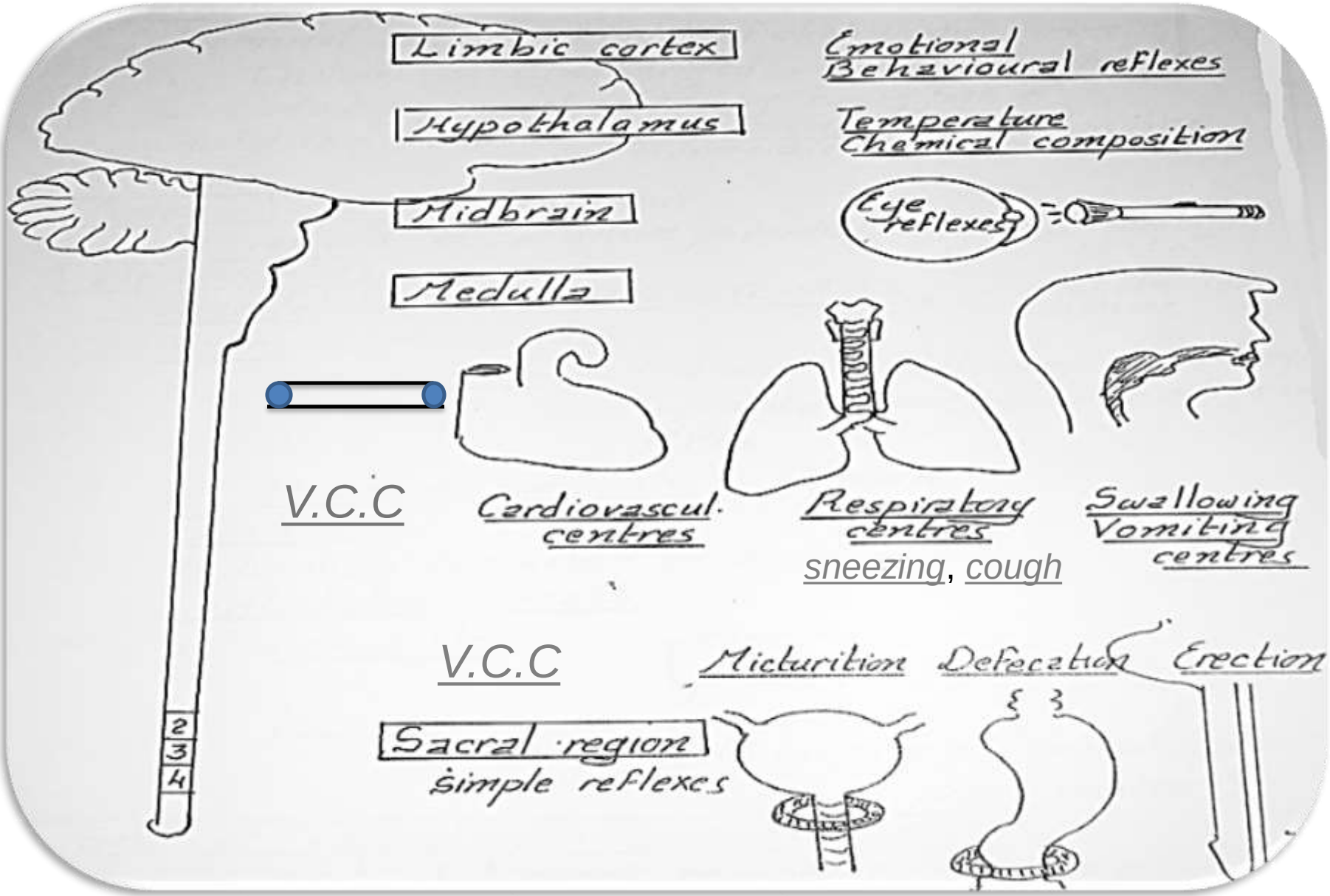

Central Regulation of Viscera

I-Spinal Cord: for simple reflexes

The LHCs act as lower autonomic control center because they show tonic activity after cutting the spinal cord from the higher centers in the brain.

A-Sacral segments (S2,3,4) center for micturition, defecation and erection reflex.

B- Thoracic and lumber segments (T1-L3) of the spinal cord act as a vasoconstrictor center (i.e. produce V.C of blood vessels).

II-Suprapinal Centers: for more complex reflexes

1-Medulla Oblongata And Pons:

Contains cardiac inhibitory center (CIC), vasoconstrictor center (VCC) & respiratory center, sneezing, cough swallowing & vomiting.

2-Midbrain: Contains the center of pupillary light reflex & accommodation reflex.

3-Hypothalamus:

A-Contains the centers that regulate the body temperature, water balance and food intake.

B-Control the autonomic function:

The posterior nuclei of the hypothalamus control the sympathetic and the anterior nuclei control the parasympathetic function

4-Limbic System: It is connect with hypothalamus to integrate autonomic, emotional and behavior reflexes.

TEST YOUR SELF

1-Which of the following represents the correct pathway leading to the perception of sound?

A. tympanic membrane, ossicles, endolymph, perilymph, hair cells
B. tympanic membrane, ossicles, perilymph, endolymph, hair cells
C. ossicles, tympanic membrane, endolymph, perilymph, hair cells
D. ossicles, perilymph, tympanic membrane, endolymph, hair cells

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2-The basilar membrane of the cochlea:

a- Is unaffected by movement of fluid in the Scala vestibuli .

b- Covers the oval window and the round window

C-Vibrates by the traveling wave produced in the fluids of the cochlea by sound waves

d- Is very rigid structure.

3-The stereocilia for hearing are exposed to

a) Endolymph in the scala vestibuli.

b) Perilymph in the scala vestibuli.

c) Endolymph in the scala media.

d) Perilymph in the scala media.

e) Endolymph in the scala tympani.

4-Which correctly describes a step in auditory signal transduction?

A. Displacement of the basilar membrane with respect to the tectorial membrane stimulates stereocilia on the hair cells.

B. Pressure waves on the oval window cause vibrations of the malleus, which are transferred via the stapes to the round window.

C. Movement of the stapes causes oscillations in the tympanic membrane, which is in contact with the endolymph.

D. Oscillations of the stapes against the oval window set up pressure waves in the semicircular canals.

5-Amplification of sound by the middle ear:

a. Occurs because the ligaments connecting the bones are usually flexible

b. Is caused by the fact that the tympanic membrane is larger in area than the oval window

c. Is decreased by cutting the facial nerve

d. changes the sound wave to mechanical vibrations.

6-Which of the following is the location of the cardiovascular regulatory centers?

a) Thalamus

b) Hypothalamus

c) Limbic system

d) Pons

e) Medulla oblongata

7-The basilar membrane:

a- Vibrates best at high frequency near the apex of the cochlea

,b- Fibers increase in diameter from the base to the apex of the cochlea

c- Fibers decrease in length from the base to the-apex of the cochlea

d Is broader at the apex of the cochlea than at the base

8-During transmission of sound waves in the cochlea:

a- The foot of the stapes moves inward against the oval window, and the round window bulges outward

b- The foot of the stapes moves inward against the round window, and the oval window

bulges outward

c- The head of the malleus moves inward against the oval window, and the round window bulges outward

d- The incus moves inward against the oval window, and the round window bulges outward

9-If a patient is unable to hear high-frequency sounds, the damage to the basilar membrane is closest to the:

a. Oval window

b. Helicotrema

c. Modiolus

d. Spiral ganglion

10-Which of the following is the location of the behavior reflexes?

a) Thalamus

b) Hypothalamus

c) Limbic system

d) Pons

e) Medulla oblongata

11-Which one of the following statements is WRONG?

A. The middle ear lies between the tympanic membrane and the oval and round windows.

B. The ossicles magnifie the sound to 60% over the normal.

C. The stapes is located in the middle ear.

D. The tectorial membrane and the basilar membrane are located in the inner ear.

12-Which of the following statements best describes the basilar membrane of the organ of Corti?

(A) The apex responds better to low frequencies than the base does

(B) The base is wider than the apex

(C) The apex is relatively stiff compared to the base

(D) High frequencies produce maximal displacement of the basilar membrane

near the helicotrema

13-An injury to the first 4 sacral segments of the spinal cord produces:

a. Hyperglycaemia.

b. V.D. in the Cutaneous blood vessels.

c. Disturbance of sweat secretion.

d. Lack of erection of the penis in males & clitoris in females.

e. Relaxation of the internal anal & urethral sphincters.

14- Which system is not regulated by center in the medulla oblongata?

a. The cardiovascular system

b. The respiratory system

c. The immune system

d. The digestive symtem

15- Regulation of the visceral functions involves the following higher centres except:

a. Cerebral cortex.

b. Cerebellum.

c. Hypothalamus.

d. Limbic system.

e. Brain stem

Answers

1- B 2. C 3.C 4.A

5-B 6-E 7-D 8-A

9-A 10-C 11-B 12- A

13 –D 14-C 15-B