

CNS Physiology



REVISION

FOR MID TERM EXAM

Done By:

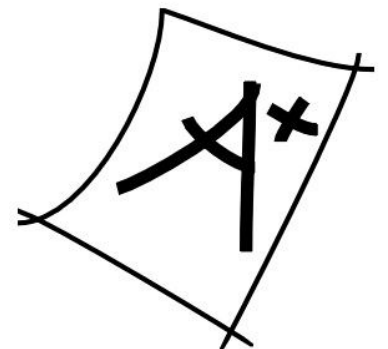
Moath Aleisa

Nouf Almasoud

Najla Aldraiweesh

Amerah Mansour

BEST OF LUCK FUTURE DOCTORS.. ;)



Lecture 1 : Physiology of Synapses and Receptors



Answers: 1.C, 2.D, 3.B, 4.B, 5.B, 6.B, 7.A

1. Regarding Chemical and Electrical synapses :

- A. Both have a physical connection between pre- and postsynaptic structures.
- B. Electrical synapses are more common than chemical.
- C. Chemical synapses depend on the release of neurotransmitters .
- D. Chemical synapses are faster than Electrical ,

2. Depolarization of the membrane of a nerve occur by the rapid influx of :

- A. Potassium ions
- B. Chloride ions
- C. Organic ions
- D. Sodium ions

3. At a synapse , impulse conduction normally :

- A. Occurs in both directions
- B. Occurs on one direction
- C. Depends on acetylcholine
- D. Depends on epinephrine

4. Increase membrane permeability to chloride ions results in :

- A. Facilitation
- B. Inhibition
- C. Differentiation
- D. Faculation

5. Which of the following is an inhibitory neurotransmitter :

- A. Glutamate
- B. Glycine
- C. Lipase
- D. Guanine

6. Which ONE of the following causes Indirect inhibition at the synapses?

- A. If an inhibitory neuron acts on a postsynaptic neuron.
- B. If an inhibitory synaptic knob inhibit a presynaptic excitatory neuron.
- C. If Renshaw cells are activated.
- D. If both flexors and extensors are inhibited.

7. The progressive decline in a synaptic transmission with repetitive stimulation is due to:

- A. Depletion of the stored neurotransmitters
- B. The diffusion of the transmitters across the synaptic cleft
- C. The synaptic delay
- D. The high PH of the blood

Lecture 2 : Autonomic Nervous System

- ★ All preganglionic neurons are **cholinergic** (Release Acetylcholine).
- ★ All parasympathetic postganglionic are **cholinergic**.
- ★ Sympathetic postganglionic are either: **Adrenergic** (Release norepinephrine) OR **cholinergic Like**: Sweat Glands & Some skeletal muscles' blood vessels that produces vasodilation.

★ Effect of Sympathetic & Parasympathetic in some organs:

Organ	Sympathetic (Fight or Fright)	Parasympathetic (Rest and Digest)
Eye	Dilated Pupil (Mydriasis)	Constricted Pupil (Miosis)
Heart	↑	↓
Lungs	Bronchodilation	Bronchoconstriction
GIT	↓	↑
Sweat Glands	↑	↓
Other Glands	↓	↑
Arterial Pressure	↑	↓
Blood Vessels	Constricted	No Effect
Bladder	Detrusor ⇒ Dilated Sphincters ⇒ Constricted	Detrusor ⇒ Constricted Sphincters ⇒ Dilated
Glucose Level	↑	↓
Mental Activity	↑	↓



Answers: 1.B, 2.B

1. A 35-year-old female was diagnosed with multiple system atrophy and had symptoms indicative of failure of sympathetic nerve activity. Which of the following statement about the sympathetic nervous system is *correct*?
 - A. All postganglionic sympathetic nerves release norepinephrine from their terminals.
 - B. Acetylcholine is released from all sympathetic preganglionic nerve terminals.
 - C. The sympathetic NS adjusts pupillary diameter by relaxing the pupillary constrictor muscle.

2. A 57-year-old male had severe hypertension that was found to result from tumor (Pheochromocytoma) compressing on the surface of the medulla (increases sympathetic activity). What is the neurotransmitter that is being *released on medulla*?
 - A. Dopamine
 - B. Adrenaline
 - C. Acetylcholine



Lecture 3 : Spinal Cord Functions & Spinal Reflexes



Answers: 1.B, 2.A, 3.C, 4.B, 5.B, 6.B, 7.D, 8.C, 9.D, 10.B

- 1. Which type of cells involved in the inhibition of other surrounding AHCs after an activation of one of the AHCs?**
 - A. Inhibitory interneuron
 - B. Renshaw neuron
 - C. Alpha motor neuron
 - D. The afferent neuron
- 2. The speed of conduction of alpha motor neuron relative to the gamma motor neuron are**
 - A. Faster
 - B. Slower
 - C. Both have the same speed
 - D. The alpha motor neuron can be faster in some cases and slower in others.
- 3. Which reflexes property of the following describe the spreading of the impulses to wider areas?**
 - A. Recruitment
 - B. Reverberating
 - C. Divergence
 - D. Convergence
- 4. Which of the following are almost correct ?**
 - A. Divergence is signals from multiple inputs uniting to excite one neuron.
 - B. The post- synaptic neurons are never excited by action potential from one pre-synaptic neuron.
 - C. The central delay is equal to 0.5 ms always
 - D. Recruitment is any discharge that occurs and continue after the cause or stimulus has ceased.
- 5. What is the final result from reverberatory circuit?**
 - A. Is the spreading of the stimulus into wide areas
 - B. Is to prolong the stimulus
 - C. It acts as an inhibitory interneuron to inhibit pain to higher centers.
 - D. These are circuit responsible for conscious awareness of the reflex
- 6. Patient with alkalosis developed epileptic seizures , what is the protective way that lead to cessation of the seizures?**
 - A. Increase in the hydrogen ion in the blood
 - B. Fatigue of the synaptic transmission
 - C. Increase in sleep neurotransmitters
 - D. Decrease in arousal neurotransmitter

7. Certain reflex has time of about 30ms, a neurophysiologist calculated the time spent in conduction of the afferent and efferent which equal to 28ms, How many synapses is involved in this reflex?

- A. 8
- B. 5
- C. 2
- D. 4

8. Certain reflex has these characteristics

Receptors : Tendon

Number of synapses : More than one

Which type of reflex is it ?

- A. Abdominal reflex
- B. Stretch reflex
- C. Inverse stretch reflex
- D. Plantar reflex

9. Which reflex properties occur if there is a sustained, repetitive stimulus ?

- A. Divergence
- B. Irradiation
- C. After-discharge
- D. Recruitment

10. The crossed extensor reflex comparing to the withdrawal reflex, it is characterized by ..

- A. Less interneurons
- B. Longer period of afterdischarge
- C. No reciprocal inhibition
- D. Shorter period of afterdischarge

Lecture 4: Stretch Reflex & Golgi Tendon Reflex



Answers: 1.B, 2.C, 3.A, 4.B, 5.A, 6.C, 7.A, 8.D, 9.B

1. Which of the following is a characteristic of nuclear bag fibers?

- A. They are one type of extrafusal muscle fiber
- B. They detect dynamic changes in muscle length
- C. They detect static changes in muscle length
- D. They are innervated by alpha motor neuron

2. Muscle stretch leads to a direct increase in firing rate of which type of nerve?

- A. Alpha motor neurons
- B. Gamma motor neurons
- C. Group 1a fibers
- D. Group 1b fibers

3. **Which of the following type of muscles fibers is innervated by only ONE afferent nerve fibers ?**
 - A. Nuclear bag fibers
 - B. Nuclear chain fibers
 - C. Extrafusal muscle fibers
 - D. A and B

 4. **What is rate of action potentials that is seen in the sensory fibers in unstretched muscle?**
 - A. More than the normal rate
 - B. Much lower than if the muscle is stretched .
 - C. No action potential at all
 - D. Normal AP at first then it starts to rise

 5. **Action potentials within which type of fiber can lead to contraction of the muscles?**
 - A. Alpha motor neuron
 - B. Gamma motor neuron
 - C. Group 1b fibers
 - D. A and B

 6. **Which of the following muscle spindle fibers mediating the asynchronous contraction of the muscle?**
 - A. Extrafusal muscle fibers
 - B. Nuclear bag fibers
 - C. Nuclear chain fibers
 - D. B and C together

 7. **Impulses from a stretched muscle will active certain alpha motor fibers by releasing**
 - A. Glycine
 - B. Glutamate
 - C. GABA
 - D. Arginine

 8. **Which of these areas can lead to hyperreflexia of the stretch reflex if there are hyperactive?**
 - A. Basal ganglia
 - B. Paleocerebellum
 - C. Medullary reticular formation
 - D. Vestibular nuclei

 9. **The type of sensory fibers encircling the golgi tendon organ are?**
 - A. Group 1a fibers
 - B. Group 1b fibers
 - C. Group 11 fibers
 - D. Group C fibers
-

Lecture 5 : Physiology of Motor Tracts



Answers: 1.C, 2.B, 3.D, 4.A, 5.B, 6.C

1. **Looking at the corticospinal tract pathway, Immediately after the arising from the cerebral cortex, the fibers will form a structure called**
 - A. Internal capsule
 - B. The pyramid
 - C. Corona radiata
 - D. Crus cerebri

 2. **Which of the following tracts is involved in the controlling of axial muscles**
 - A. Lateral corticospinal tract
 - B. Anterior corticospinal tract
 - C. Rubrospinal tract
 - D. Olivospinal tract

 3. **Patient with stroke in the right motor cortex involving the basal ganglia of the same side,What are the symptoms that is seen in this patient?**
 - A. Flaccid paralysis of the body right side.
 - B. Flaccid paralysis of the body left side.
 - C. Spasticity of the body right side
 - D. Spasticity of the body left side

 4. **Which of the following tracts involved in the standing from a chair?**
 - A. Lateral vestibulospinal tract
 - B. Rubrospinal tract
 - C. Medullary reticulospinal tract
 - D. Corticospinal tract

 5. **A car driven with high speed toward you while you are crossing the street, you acted by running away from the car, Which type of tracts involved in this type of reflex?**
 - A. Corticospinal tract
 - B. Tectospinal tract
 - C. Rubrospinal tract
 - D. Vestibulospinal tract

 6. **Which of the following tracts can partially do the job for the corticospinal tract?**
 - A. Vestibulospinal tract
 - B. Tectospinal tract
 - C. Rubrospinal tract
 - D. Medullary reticulospinal tract
-

Lecture 6 : Physiology of Pain



Answers: 1.D, 2.C, 3.B, 4.A, 5.A, 6.C, 7.B, 8.A, 9.D, 10.C

1. **Which of the following fibers are unmyelinated afferent fibers?**
 - A. $A\alpha$ fibers
 - B. $A\beta$ fibers
 - C. $A\delta$ fibers
 - D. C fibers

2. **Complete removal of the somatic sensory areas of the cerebral cortex lead to....**
 - A. Destroy the conscious pain perception
 - B. The painful stimuli will be felt but without localization.
 - C. The painful stimuli will be felt with localization.
 - D. There will be only Interpreting the pain quality.

3. **Which of the following is describing the pain receptors (nociceptors)?**
 - A. Have a low threshold level.
 - B. Adapt very easily.
 - C. Do not adapt at all.
 - D. Respond only to mechanical stimuli.

4. **The fast pain sensation can be produced by which type of stimuli**
 - A. Mechanical + Thermal
 - B. Mechanical + Chemical
 - C. Chemical + Thermal
 - D. All types of stimuli

5. **The neurotransmitter that is released by $A\delta$ fibers in fast pain sensation**
 - A. Glutamate
 - B. Glycine
 - C. Substance P
 - D. Arginine

6. **The neurotransmitter that is released by C fibers in slow pain sensation**
 - A. Glutamate
 - B. Glycine
 - C. Substance P
 - D. Arginine

7. **Which type of pain pathway is associated with poorly localized pain sensation**
- A. Neospinothalamic tract.
 - B. Paleospinothalamic tract.
 - C. Spinocerebellar tract
 - D. Olivospinal tract
8. **Fracture of the femur bone is associated with which type of pain?**
- A. Deep pain with poor localization
 - B. Superficial pain with poor localization
 - C. Deep pain with localization
 - D. Visceral pain
9. **Referred pain is frequently seen with....**
- A. Visceral pain
 - B. Deep pain
 - C. Superficial pain
 - D. a+b
10. **Impulses reaching which area is associated with strong arousal effect ?**
- A. Somatosensory area of cerebral cortex
 - B. The midbrain
 - C. Reticular formation of brain stem
 - D. The motor area of the cerebral co
-

Lecture 7 : Physiology of Sleep



Answers: 1.C, 2.D, 3.C, 4.B, 5.C, 6.A, 7.D, 8.B

1. When does Melatonin secretion begin?

- A. 10 - 15 mins before bed time.
- B. At the beginning of relaxation.
- C. 3 hours before bed time.

2. Non-REM happens to be in:

- A. stage 2
- B. Stage 3+4
- C. all stages of sleep.
- D. Any stage of sleep that doesn't include REM

3. The main pacemaker in mammals:

- A. The ventrolateral preoptic nucleus
- B. Hypothalamus
- C. Suprachiasmatic nucleus

4. Which is not true regarding sleepwalking:

- A. Sleepwalkers tend to experience daytime sleepiness and fatigue.
- B. It happens During REM Sleep.
- C. After waking up, the person wouldn't have any memory of this sleepwalking episode.
- D. It can be genetic.

5. Regarding the electroencephalogram (EEG):

- A. The normal EEG of an awake person is dominated by alpha waves
- B. Slow wave sleep is associated with rapid eye movements
- C. The EEG can be used to monitor the health of the brain

6. A damage to which of the following will not make the body able to differentiate between the day and night?

- A. The ventrolateral preoptic nucleus
- B. The suprachiasmatic nucleus
- C. Raphe nuclei

7. Which is true regarding the The ventrolateral preoptic nucleus:

- A. Have projections to many brain areas contain neurotransmitter (Glanin and GABA) associated with arousal.
- B. VLCO is inhibited by noradrenaline and acetycholine.
- C. VLPO is activated by serotonin adenosine Prostaglandins D12
- D. All of above.

8. A really dangerous disease where you lose your muscle tone suddenly:

- A. Sleep Apnea
- B. Narcolepsy
- C. Fatal Familial

Lecture 8 : Physiology of Brainstem

★ Brainstem lesions:

	Midbrain	Pons	Medulla
CN Affected	3rd & 4th	5th, 6th, 7th & 8th	9th, 10th, 11th & 12th
Symptoms	Midposition to dilated pupil	Pinpoint pupil	Dilated pupil
	Ptosis	Apneustic	Ipsilateral paralysis
	Hyperventilation		Abnormal breathing
	Abnormal extensor		Absent gag reflex
LOC	Varies	Semi-coma	Coma



Answers: 1.A, 2.C, 3.A, 4.D, 5.A, 6.A, 7.B, 8.C, 9.A, 10.C

1. Which ONE of the following is a function of midbrain:

- A. Auditory & visual reflexes B. Respiratory center C. Cardiac center

2. The vasomotor center is located in:

- A. Pons B. Midbrain C. Medulla oblongata

3. Which ONE of the following is a test for brainstem reflexes:

- A. Gagging B. Motor power C. Sleep D. Vomitting

4. Which ONE of the following is test for reticular formation:

- A. Alertness B. Consciousness C. Sleep D. All of the above

5. Which ONE of the following is *true* about oculo-cephalic reflex:

- A. Eyes rotate to the opposite side to direction of head rotation
B. Eyes rotate to the same side to direction of head rotation
C. The nystagmus is seen after injecting the ear with iced water

6. Injection of iced water into the ear is called:

- A. Vestibulo-ocular reflex B. Vestibulo-trochlear reflex C. Oculo-cephalic reflex

7. Regarding question 6, what will be the response of this reflex:

- A. Eyes closing B. Eyes movement C. Head movement to same side

8. Which ONE of the following contains the gag, swallow and vomiting centers:

- A. Midbrain B. Pons C. Medulla oblongata

9. Which ONE of the following tests does *not* indicate a brainstem function:

- A. Knee jerk B. Cough reflex C. Pupillary reflex D. Respiratory

10. Patient with dilated pupils, poor salivation, and hoarseness of the voice, hypogeusia (decreased sensitivity to taste) got in coma, After doing some investigation the doctor conclude that the patient has a lesion in

- A. Midbrain B. Pons C. Medulla oblongata D. motor area 4
-

Lecture 9 : Physiology of Eye & Refraction

★ Errors of Refraction:

	Myopia	Hyperopia	Presbyopia	Astigmatism
Cause	Large eyeballs Or Long antero-posterior diameter Or strong lens	Small eyeball Or Weak lens system	Older age ⇒ Loss of accommodation	Uneven/nonuniform corneal curvature
Focus	In Front of retina	Behind retina	Behind retina	Too many
Corrected By	Concave lens	Convex lens		Cylindrical lens



Answers: 1.C, 2.A, 3.D, 4.A, 5.C, 6.B, 7.A, 8.D, 9.C, 10D

1. An emmetropic eye has a refractive power of:

- A. 60 - 70 Diapoter B. 49 - 50 Diapoter C. 59 - 60 Diapoter

2. Which ONE of the following is the cause of cataracts:

- A. When the proteins of the lens get neutered B. Increase intraocular pressure

3. Which ONE of the following is *not* a refractive media of the eye:

- A. Lens B. Cornea C. Vitreous humor D. Iris

4. The lens has a RP of 20D which is less than the corneal RP, but due to the lens accommodation it's considered to be more important:

- A. True B. False

5. Which ONE of the following is *true* about vitreous humor:

- A. Between anterior lens and iris B. Drained by canal of schlemm C. Remains from birth

6. Which of the following is a feature of fovea centralis:

- A. Contains only rods B. Color vision C. Physiological blindness

7. Which part of the eye that will get damage in case of Glaucoma:

- A. Optic nerve fibers B. Iris C. Ciliary body

8. Accommodation by the lens could be up to:

- A. +40D B. +100D C. +2D D. +12D

9. The Inner plexiform layer of retina contains:

- A. Bipolar cells B. Rods & cones cell bodies C. Amacrine cells D. Horizontal cells

10. The outer plexiform layer of retina contains:

- A. Bipolar cells B. Rods & cones cell bodies C. Amacrine cells D. Horizontal cells

Lecture 10 : Visual Accommodation & Pupillary Light Reflex

★ Visual pathway:

Rods & cones → Optic nerve → Optic chiasma → Optic tract → LGB ⇒ ⊗ Optic radiation → Visual cortex (Occipital lobe area 17)

★ Visual fields:

Right Eye		Left Eye	
Right visual field	Left visual field	Right visual field	Left visual field
Nasal tract	Temporal tract	Temporal tract	Nasal tract

● Right side of both visual fields projects to left side of brain

● Left side of both visual fields projects to right side of brain

Thus, nasal tracts cross to the opposite side in the optic chiasm while temporal do NOT!

★ Accommodation reflex:

Near object → Neural pathway → Contraction of ciliary muscles → slack/relaxed ligaments → Increase curvature of lens (rounded lens).

⊗ Accommodation pathway: ⇒ Superior colliculus

★ Pupillary light reflex:

Light on one eye pupil → Neural pathway → Contraction of circular muscle (constrictor pupillae) → of Miosis in both eyes

⊗ Pupillary reflex pathway: ⇒ Pretectal nucleus



Answers: 1.B, 2.A, 3.D, 4.C, 5.D

1. Which ONE of the following is *correct* about Argyll Robertson Pupil:

- A. Lost accommodation & preserved pupillary reflex
- B. Lost pupillary reflex & preserved accommodation

2. Which ONE of the following is a major mean of depth perception:

- A. Stereopsis
- B. Myopia
- C. Mononuclear vision
- D. None

3. Which ONE of the following is *not* a function of lateral geniculate body (LGB):

- A. Relay station
- B. Point to point transmission
- C. Color vision
- D. None

4. The magnocellular pathway in LGB is responsible for:

- A. Color vision
- B. Texture
- C. Flicker
- D. None

5. Which ONE of the following is the association visual cortex responsible for:

- A. Interpretation of visual stimuli
- B. Fixation
- C. Brightness
- D. Both A & B

Lecture II : Phototransduction in Light and dark



1.C, 2.A 3.C, 4.A 5.A 6.C, 7.C, 8.C

1. The depression in the central region of the retina producing sharpest vision is called :

- A. The optic disk
- B. The vitreous body
- C. The fovea centralis

2. Regarding the cones and rods :

- A. The inner segment is thicker in cones
- B. Cones have two types of rhodopsin
- C. The visual threshold of cones is lower than rods

3. Photosensitive compounds are manufactured in :

- A. Choroid
- B. Outer segment of photoreceptors
- C. Inner segment of photoreceptors

4. The low convergence of cones serves in :

- A. Increasing the acuity of the vision
- B. Increasing the sensitivity to the light
- C. Decreasing the acuity of vision

5. The blind spot is related to :

- A. Optic disc
- B. Fovea centralis
- C. Macula lutea

6. Visual purple vision is produced by :

- A. Red-green light
- B. Blue-red light
- C. Green-blue light
- D. Cones photoreceptors

7. In the visual cycle action potential is generated at :

- A. Photoreceptors
- B. Bipolar cells
- C. Ganglion cells

8. Instantaneous & rapid Changes in the Visual Image is transmitted by :

- A. W ganglion cells
- B. X ganglion cells
- C. Y ganglion cells

Lecture 12 : Physiology of color vision



Answers: 1.A, 2.B, 3.D, 4.C, 5.B, 6.C, 7.A, 8.B

1. The primary colors (Red, green, and blue) are sensed by which of the following?

- A. Cones in fovea
- B. Cones in the peripheral
- C. Rods in fovea

2. Perception of white is due to which of the following?

- A. absence of light
- B. equal stimulation of all primary colors cones
- C. extreme saturation of red and green colors

3. Sensation of any color depends on which of the following?

- A. Wavelength of light
- B. Amount of light absorbed by each type of cones
- C. Frequency of impulses from each cone system to ganglion cells
- D. all of above

4. Green cone system responses to..?

- A. large wave length
- B. small wave length
- C. middle wave length

5. The gene for blue sensitive cone pigment is on which of the following?

- A. chromosome X
- B. chromosome 7
- C. chromosome 3

6. Which of the following is false regarding green- red blindness?

- A. It is chromosome X-linked disease
- B. the patient won't be able to see different colors between wave length 525-675 nm
- C. most common in females.

7. Protanopia is a condition of which of the following

- A. Dichromate
- B. Monochromats
- C. Trichromats

8. Tritanopia means?

- A. Person can see only long and short wave length
- B. The absence of blue cones system
- C. The individual can see black or grey or have no color perception.

Lecture 13 : Physiology of Hearing



Answers: 1.C, 2.D, 3.B, 4.A, 5.D, 6.A, 7.C

1. Which of the following is not a structure in the middle ear :

- A. Incus
- B. Stapedius
- C. Labyrinth
- D. Eustachian tube

2. Organ of corti is located on :

- A. Reissner's membrane
- B. Tectorial membrane
- C. Oval window
- D. Basilar membrane

3. Interpretation of auditory signals occurs in :

- A. Primary auditory cortex
- B. Auditory association area
- C. Thalamus
- D. Inferior colliculus

4. Which of the following can contribute in a perceptive deafness :

- A. Neuritis
- B. Wax
- C. Perforated drum
- D. Sclerotic ossicles

5. transmission of sound wave through the inner ear occurs through :

- A. Nerve fibers
- B. Air
- C. Ossicles
- D. Fluid

6. conduction deafness involves structures in :

- A. Outer and middle ear
- B. Cochlea
- C. Inner ear

7. A loud sound is High in :

- A. Frequency
- B. Tone
- C. Intensity
- D. Quality

Lecture 14 : Physiology of Taste and smell



1.A, 2.B 3.C, 4.B 5.B 6.B, 7.B, 8.A, 9.A

1. Taste is received by which of the following receptors:

- A. Gustatory Receptors
- B. Adenyl cyclase
- C. Bipolar neuron

2. The type of papillae that doesn't contain taste buds:

- A. Circumvallate
- B. Filiform
- C. Fungiform

3. Glossopharyngeal nerve carry sensation from:

- A. The posterior 2/3 of tongue
- B. The anterior 2/3 of tongue
- C. The posterior 1/3 of tongue

4) There are taste buds in the mid dorsum of the tongue:

- A. True
- B. False

5. The 2nd order neuron's axons of taste pathway terminate in:

- A. Medulla oblongata
- B. The ventrobasal complex of thalamus
- C. Operculum

6. Dysgeusia is a medical condition that means:

- A. Complete loss of taste
- B. Distributed taste

7. Parasomnia could be caused by which of the following?

- A. Activation of parasympathetic system
- B. Pregnancy
- C. Acid reflux

8. Where is the olfactory epithelium located?

- A. Roof of nasal cavity
- B. Anterior of nasal cavity

9. Olfactory receptor neurons carry impulses directly to the brain without passing to the thalamus:

- A. True
- B. False

Lecture 15: Physiology of Consciousness

★ Reticular Formation:

	Lateral RF	Paramedian RF	Median RF
Composed of	Small neurons	Large neurons	Raphe nuclei
Receives	*Touch & pain *Vestibular info *Auditory info *Olfactory *Visual	*Lateral RF	-
Contains	-	Noradrenergic, Dopaminergic & Cholinergic neurons	Serotonergic neurons

Excitatory area of RF (Bulboreticular facilitatory) + Thalamus =

RAS (Reticular Activating System)

If RAS ↓↓	If RAS ↑↑
*Under-aroused cortex *Difficulty in learning *Poor memory *Little control *Maybe coma	*Over-aroused cortex *Hyper-vigilance *touching everything *Talking too much *Restless Hyperactive

★ EEG Waves

Alpha	Beta	Theta	Delta
Parietal & Occipital	Frontal	Temporal & Occipital	Cerebral cortex
10-12 cycles/sec	13-25 cycles/sec	5-8 cycles/sec	1-5 cycles/sec
Awake, relaxed & eyes closed.	Visual stimuli & mental activity	In adults severe emotional stress	*Sleep *BUT when awake it indicates brain damage
alpha	beta	theta	delta

See how CNS Physiology is a piece of cake? :)

توكلوا على الله وقلكم ال ، أنتم قدها يا أطباء المستقبل