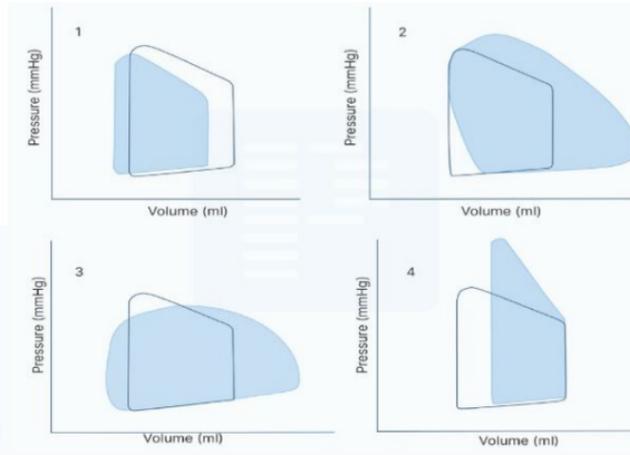
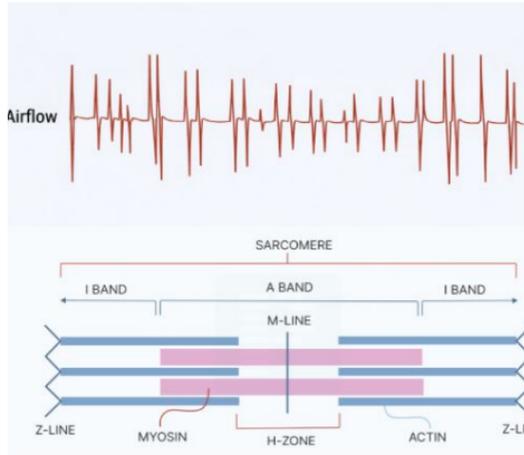


PHYSIOLOGY



1. A 30-year-old man has been posted at Leh (15,000 feet) for the past 8 months for Border Roads Organization work. He now complains of progressive fatigue, headache, and exertional dyspnea. Examination shows facial plethora and mild cyanosis. Which of the following features indicates development of chronic mountain sickness?

a. Confusion due to hypobaric hypoxia

HACE

Monge disease

⇒ [Sluggish circulation]

b. Confusion due to hypoxic hypoxia

c. Pink frothy sputum

⇒ lung disease

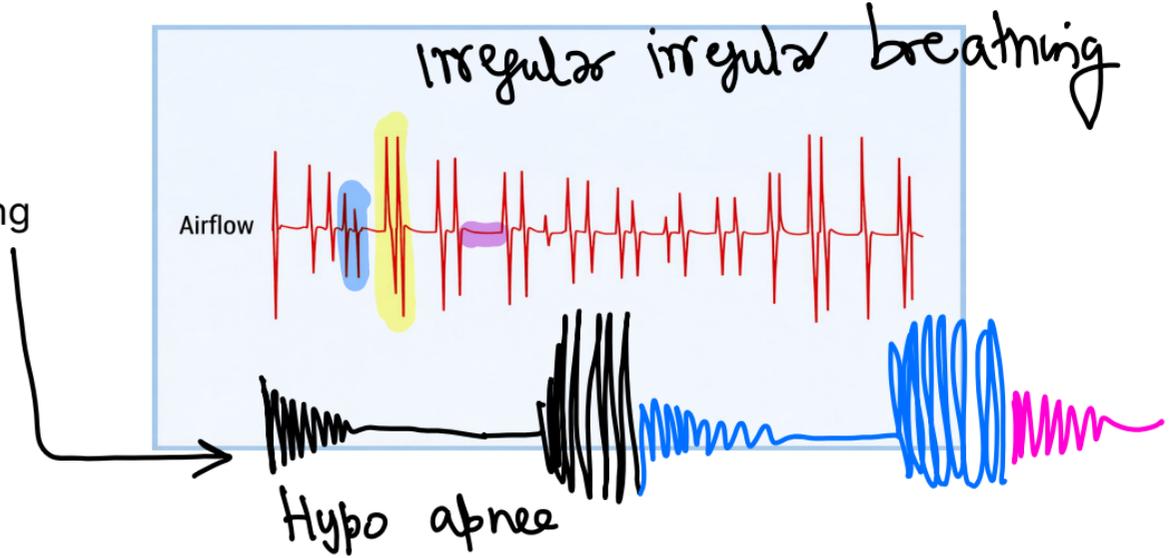
↳ Asthma COLD FES
Pneumonia

(d) Polycythaemia

HAPE

2. Which of the following breathing pattern shown is shown for this critically sick patient admitted to intensive care unit with desaturation and unstable vitals?

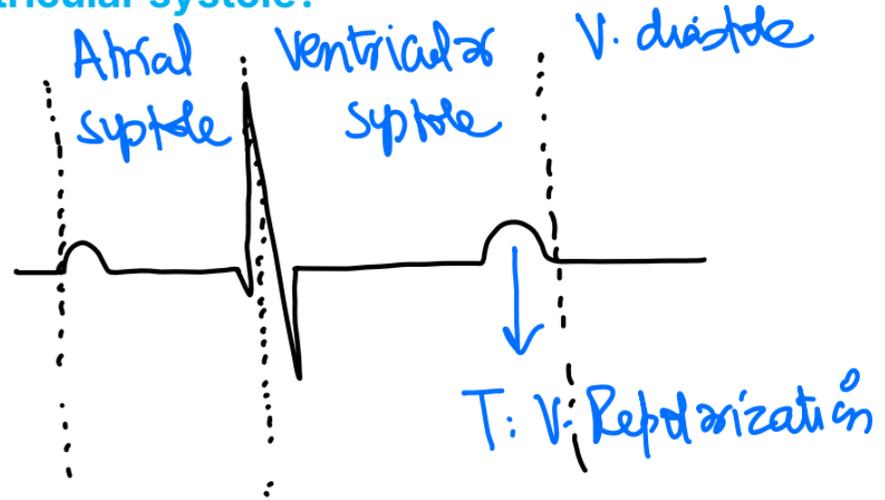
- a. Apneustic breathing
- b. Biot's breathing
- c. Cheyne stokes breathing
- d. Kussmaul breathing



* HAPF Hyper
* AHF * (h)
* ↑ICP

3. Which is correct about mechanical ventricular systole?

- a. Start of q wave to end of S wave
- b. Start of q wave to start of S wave
- c. Peak of R wave to start of T wave
- d. Peak of R wave to end of T wave



4. A 28-year-old healthy volunteer is infused with inulin to measure glomerular filtration rate. After achieving steady state, the following values are obtained:

Urine inulin concentration (U_{inulin}) = 60 mg/dL

Plasma inulin concentration (P_{inulin}) = 1.2 mg/dL

Urine flow rate (V) = 2 mL/min

What is the glomerular filtration rate?

a. 50 mL/min

b. 75 mL/min

c. 100 mL/min

d. 120 mL/min

↓

$$\frac{UV}{P}$$
$$\frac{60 \times 2}{1.2}$$

5. A patient with primary hyperparathyroidism will most likely have:

- ~~a.~~ Increased phosphate reabsorption in PCT
- ~~b.~~ Decreased calcium reabsorption in DCT
- c.** Increased 1,25-dihydroxy vitamin D formation
- ~~d.~~ Decreased bone resorption

PTH ↑ = 84 AA

1. Bone Resorption: Ca^{2+} ↑

2. PCT: PO_4 loss: PO_4 ↓

PTH ↑ = vit D₃ ↑
 Ca^{2+} out Calcium in
Bones

6. Which of the following is correct about Starling forces

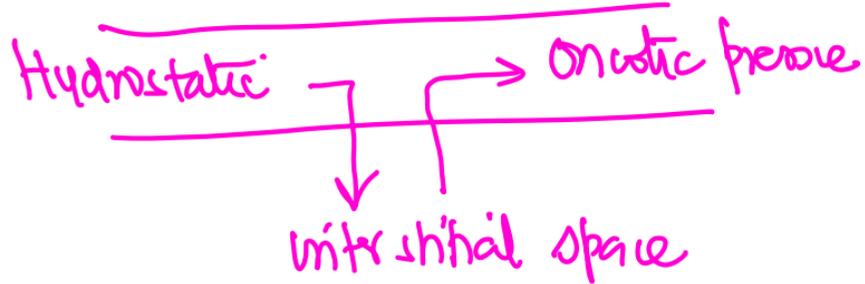
- a. Increased preload increases force of contraction
- b. Decreased preload increased force of contraction
- c. Determine fluid movement across capillaries
- d. Determine fluid movement across post capillary venules

FRANK STARLING LAW

IVF

- * ↑ PRELOAD
- STRETCHING of ♥
- * ↑ FOC

STARLING FORCES

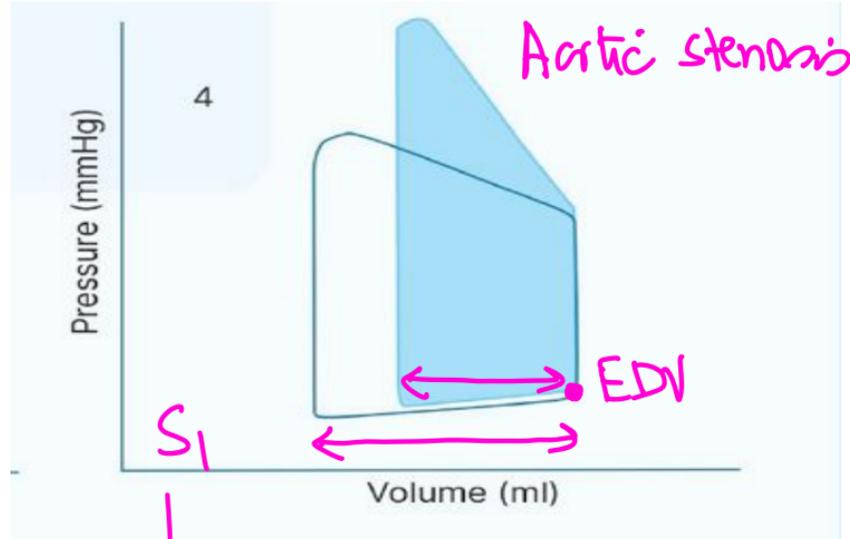


7. Which of the following fibers has the slowest conduction velocity?

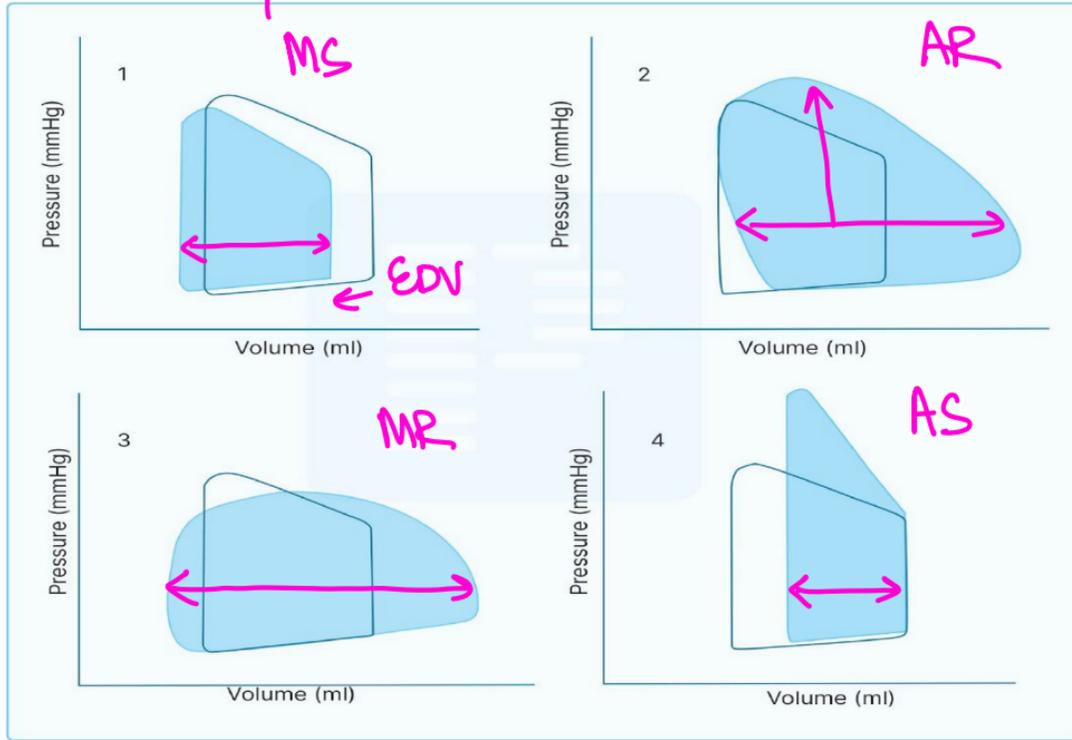
- a. C fibers
- b. A-delta fibers
- c. A-beta fibers
- d. B fibers

8. The following pressure volume curve corresponds to which pulse finding

- a. Pulsus alternans *LHF*
- b. Dicrotic pulse *DCM*
- c. Pulsus Parvus
- d. Collapsing pulse *AR*

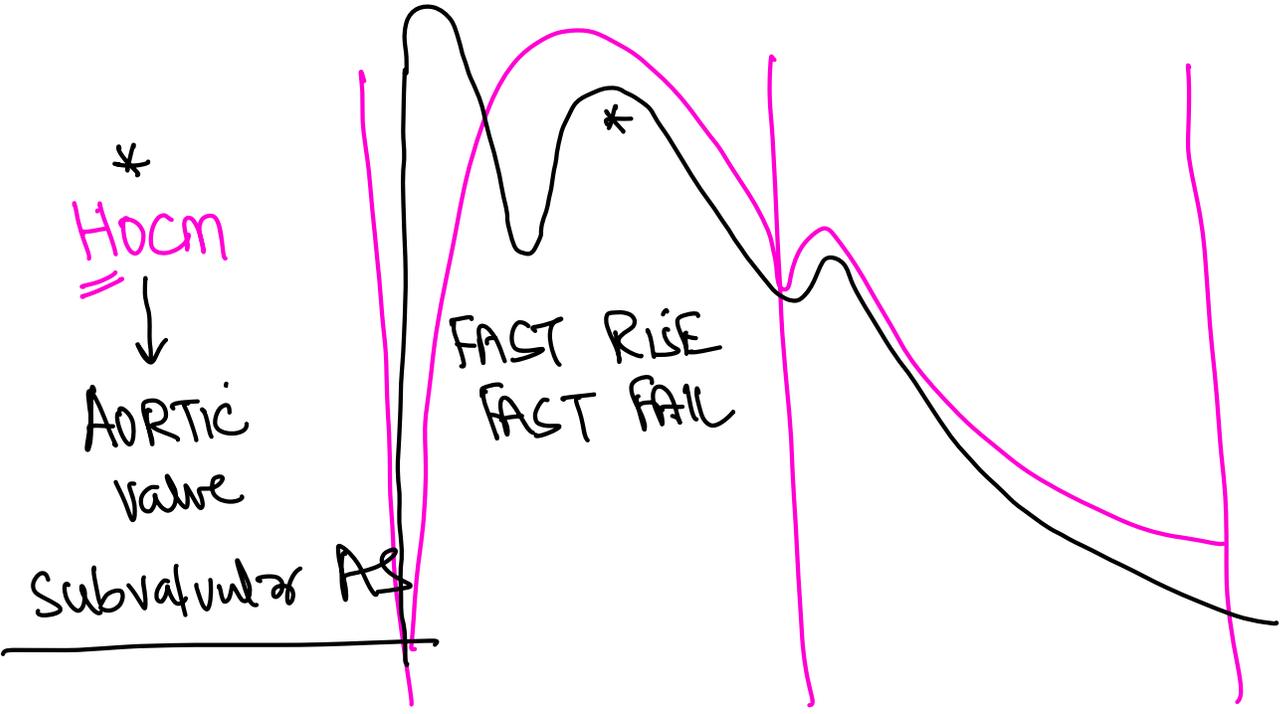


et Torus



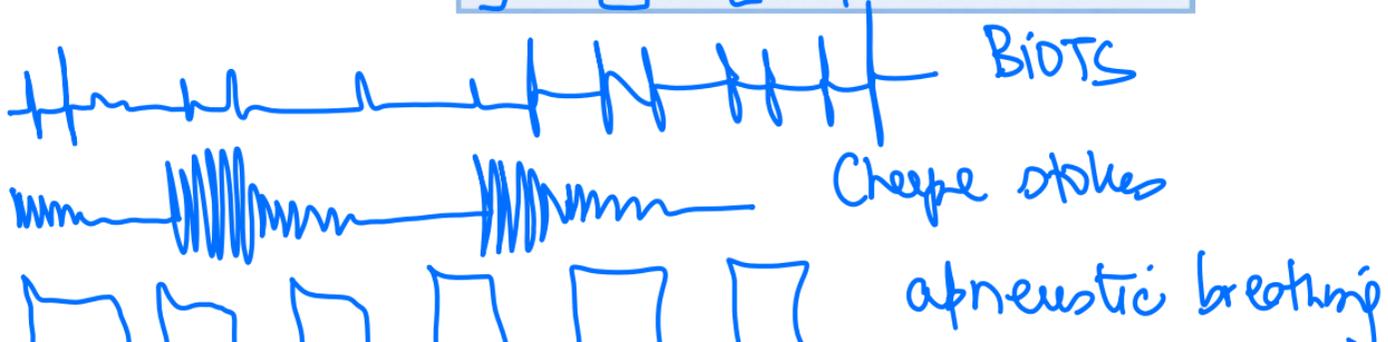
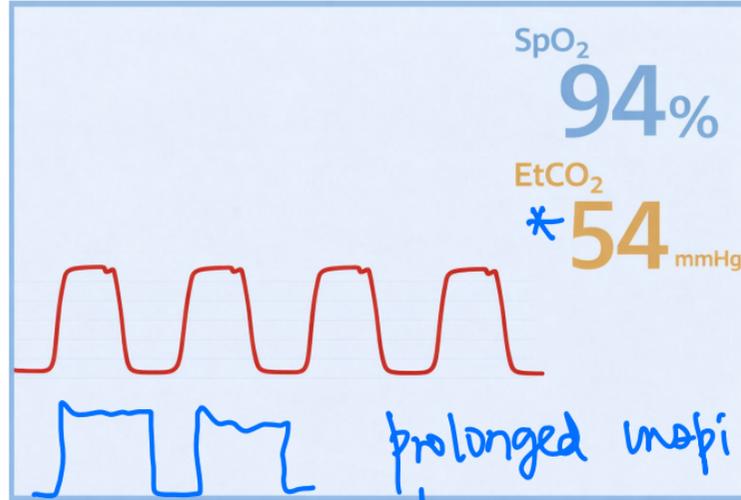
PV
loops

*



9. Comment on the breathing pattern shown in this patient with stroke

- a. Cheyne stokes breathing
- b. Biot breathing
- c.** Apneustic breathing
- d. Kussmual breathing



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10. Patient develops spinal cord transection at level of T4. Which of the following will be seen in this patient in spinal shock

- a. Bradycardia with hypertension
- b. Bradycardia with hypotension
- c. Ipsilateral loss of proprioception above the level of lesion
- d. Contralateral loss of pain and temperature above the level of lesion



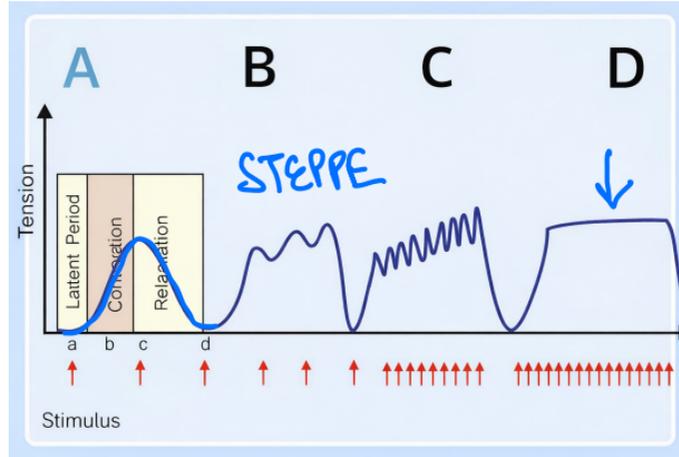
~~Sym ⊕ To heart~~
HR ↓ BP ↓

HR ↓ BP ↑ = Cushing Reflex
HR ↓ BP ↓ = Spinal shock

11. The graph below shows skeletal muscle tension in response to increasing frequency of stimulation. Which of the following labelled segments indicates tetanus of skeletal muscle?

Sustained ↑ in Tone

- a. A
- b. B
- c. C
- d. D



12. A 58-year-old right-handed man develops sudden difficulty in speaking after a left middle cerebral artery infarct. He understands commands and follows instructions appropriately but speaks in short, effortful phrases with impaired repetition. Writing is also affected. Which area of brain is affected?

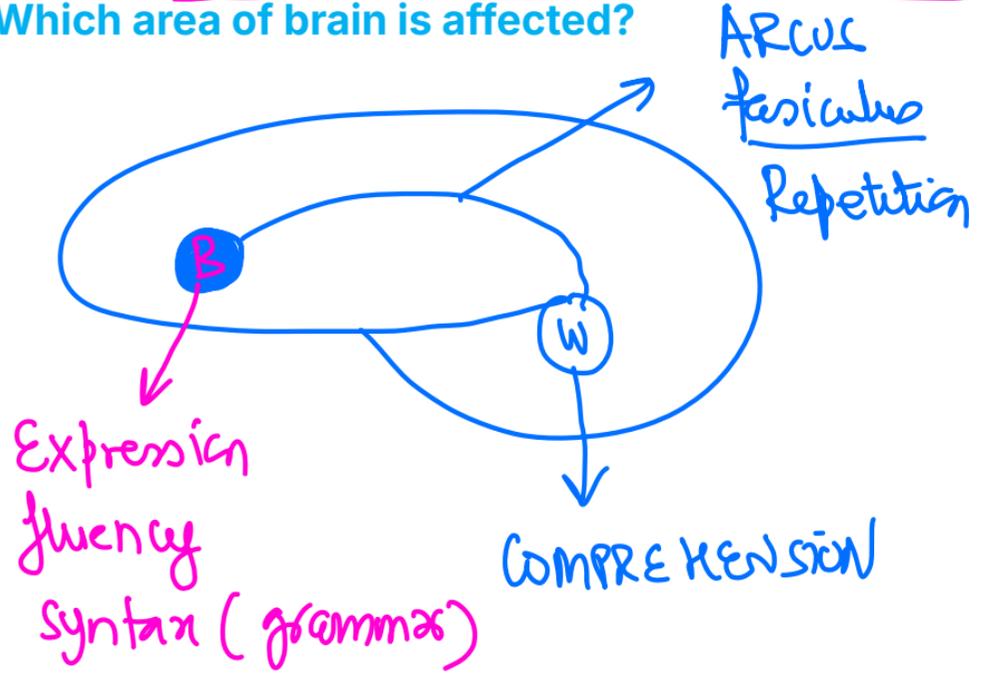
a. Inferior frontal gyrus **BROCA**

b. Superior frontal gyrus

c. Inferior temporal gyrus

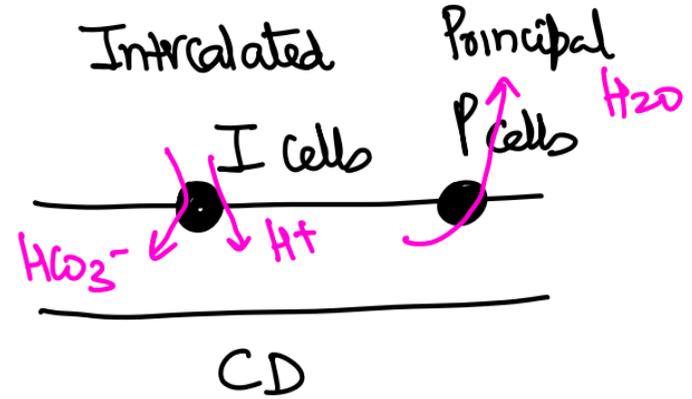
d. Superior temporal gyrus

↓
WERNICKE



13. Which of the following cells in the kidney regulate loss of acid as ammonium ions?

- a. Lacis cells intermediate cells
- b. Granular cells JG cells: Renin
- c. Alpha intercalated cells H⁺ excretion
- d. Beta intercalated cells HCO₃ "



14. Which hormone is **not** produced by the kidney?

- a. Aldosterone Z. GLOMERULOSA of Adrenal CORTEX
- b. Renin ✓ → JG cells/ granular cells
- c. Vitamin D3 ✓ → PCT: 1 α Hydroxylase
- d. Erythropoietin ✓ → PERITUBULAR cells

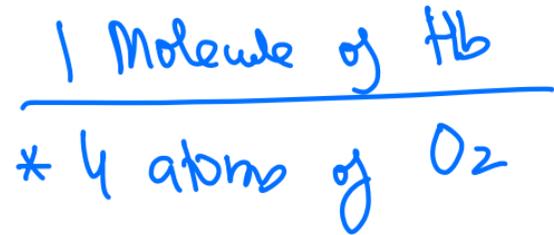
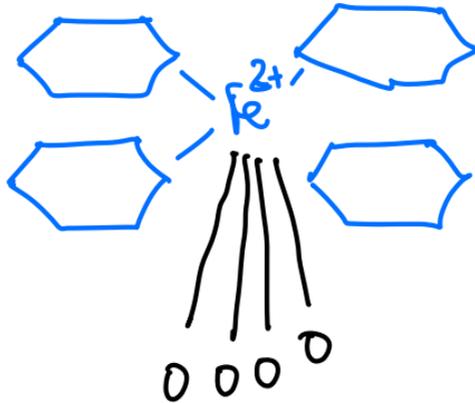
15. Which organ of body has maximum blood flow / gm of body weight?

CHEMOSENSOR

- a. Carotid body
- b. Adrenal gland
- c. Liver
- d. Spleen

16. Which of the following is not correct about haemoglobin

- a. Transports carbon dioxide as deoxyhemoglobin ✓
- b. 1 gm carries 1.34 ml of oxygen ✓
- c. Performs extracellular **Buffer base** action
- d. Tetrapyrrole rings ✓



17. Which of the following is the earliest haemoglobin to appear in embryonic development?

- a. Gower
- b. Portland
- c. Foetal haemoglobin
- d. Haemoglobin A

* GOWER 1 = 2 wks of gestation

GOWER 2

Portland

HbF = 14 wks

HbF HbA ← = 38 weeks at (birth)
HbA₂

19. Which of the following is the scantiest cell in peripheral blood

a. Neutrophil 50-70%

b. Basophil 0-1%

c. Monocyte 2-10%

d. Eosinophil 1-6%

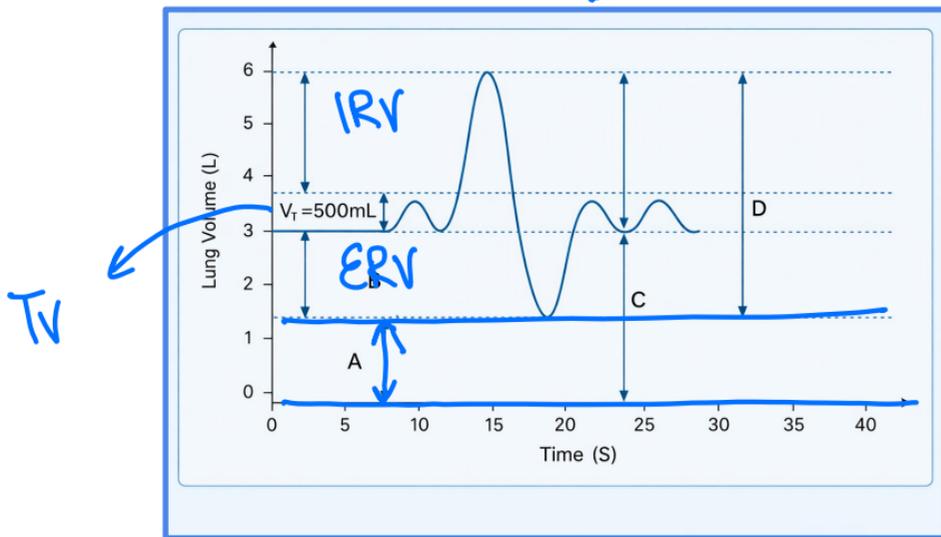
20. Clotting factor with longest half-life is?

- a. Factor II
- b. Factor VII
- c. Factor X
- d. Factor XIII

SHORTEST

21. Which of the following lung volumes cannot be measured by spirometry?

- a. A
- b. B
- c. C
- d. D



Residual
Volume
↓
body plethysmography

22. DLco is increased in which of the following conditions?

- a. Interstitial lung disease **FIBROSIS**
- b.** Pulmonary haemorrhage syndrome
- c. Pneumocystis Jiroveci pneumonia
- d. Acute respiratory distress syndrome

DLco : ↑

A Asthma

C CHF

P pulmonary hemorrhage

23. Which hormone will decrease with aging in a female?

a. LH ↑

b. FSH ↑

c. Testosterone

d. Epinephrine No change

estrogen ↓
progesterone ↓
Testosterone ↓

24. GLP-1 hormone is produced from which of the areas

- a. Pancreas
- b. Duodenum
- c. Jejunum
- d. Ileum

GLP-1
⊕ Inulin products

CAJAL cells

↓
25. Which of the following is not correct about Pacemaker cells of intestine?

- a. Migratory motor complexes → MOTIUN
- b. Basal electrical rhythm ✓
- c. Located in myenteric plexus ✓
- d. Present between outer circular and longitudinal muscle layers ✓

26. Which cells of pancreas produce pancreatic polypeptide

a. Alpha cells *glucagon*

b. Beta cells *insulin*

c. I-cells *→ GIP*

d. F-cells

A
B
C
F



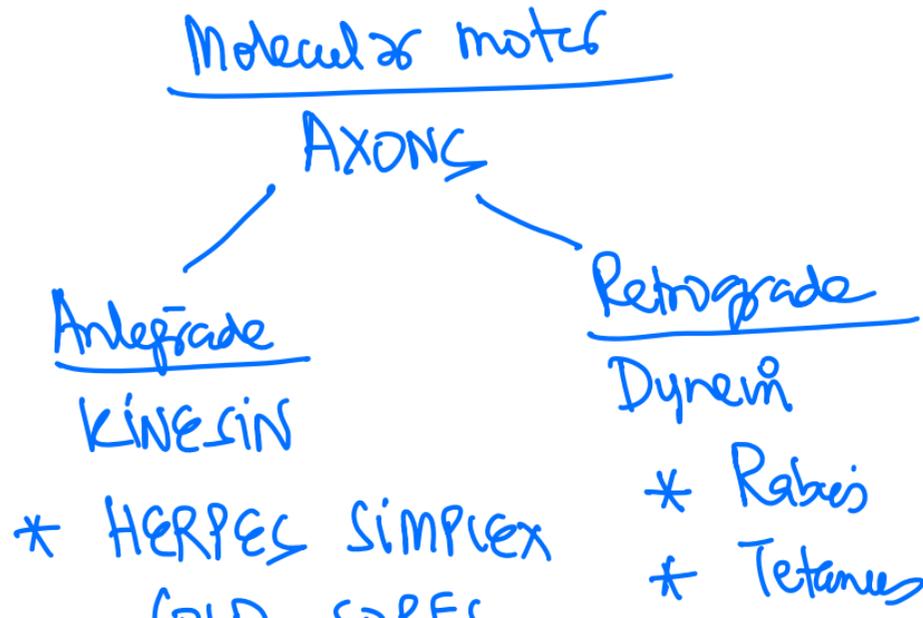
27. Maximum saliva production in resting state is from which of the following glands

- a. Submandibular
- b. Parotid
- c. Sublingual
- d. Minor salivary glands

28. A child from slums went for open air defecation and was attacked by a pack of stray dogs. He subsequently developed rabies. The rabies will attack the nervous system using _____ in the axonal transport system?

- a. Kinesin
- b. Dynein
- c. Actin
- d. Myosin

retrograde Tx



WLD SURFS

* SHINGLES

29. Which of the following will inhibit SGLT1?

- a. Empagliflozin
- b. Phlorizin
- c. Dapagliflozin
- d. Moxifloxacin

a, c = SGLT2 i

L DNA gyrase ⊖

30. Which of the following is the excitatory cell of cerebellum?

a. Purkinje cells ⊖

b. Stellate cells ⊖

c. Golgi cells ⊖

d. Granule cells : glutamate

31. Which of the following is an example of secondary active transport?

a. H-K-ATP ase



b. Na-K pump



c. Ca ATP ase



d. Na- Ca exchanger

a lot of right below

Saturday night palsy ✓

32. A 30-year-old man falls asleep after heavy alcohol intake with his arm draped over a chair. The next morning, he develops weakness of wrist extension with wrist drop. Examination reveals intact triceps strength but weakness of extensors of the wrist and fingers. Nerve conduction studies show a transient conduction block at the spiral groove of the humerus. Which of the following best describes the structural status of the nerve in this condition?

- a. Both axon and endoneurium are disrupted ✓
- b. Axon is disrupted ✓ but endoneurium is intact
- c. Axon and endoneurium are intact
- d. Complete disruption of nerve including endoneurium and perineurium ✓

Neuropraxia

33. All of the following increase the activity of Na-K pump except?

a. Thyroxine ✓

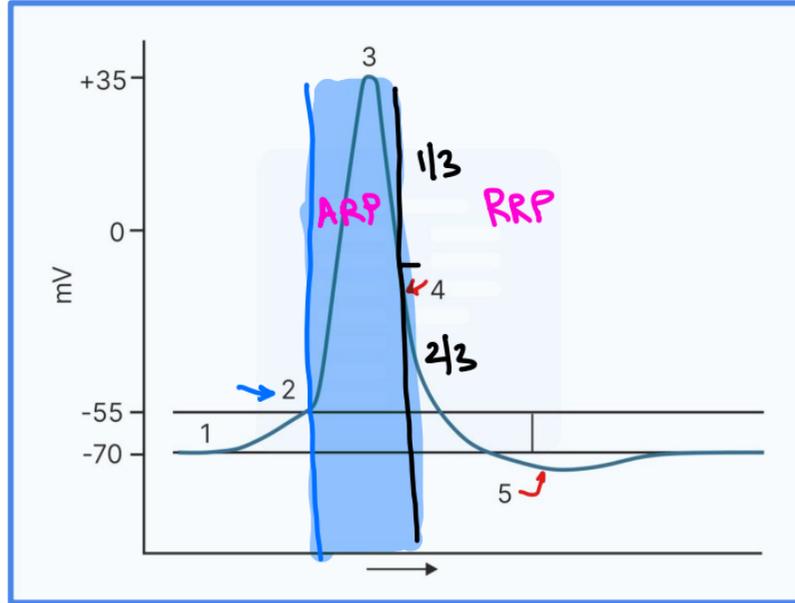
b. Aldosterone ✓

c. Insulin ✓

d. Oligomycin ⊖ electron Transport chain

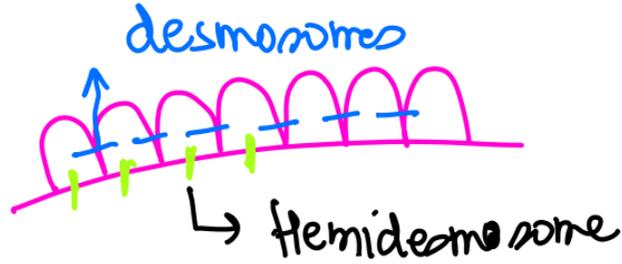
34. Which of the following markings is correct about the absolute refractory period of a nerve?

- a. 1 to 2
- b. 1 to 4
- c. 2 to 5
- d. 2 to 4



35. Cell to basal lamina junction is by which of the following?

- a. Desmosomes
- b. Hemidesmosomes
- c. Tight junctions
- d. Gap junctions



36. A 24-year-old male presents with rapidly progressive flaccid paralysis, areflexia, and impaired vibration and position sense. LP report shows cyto-albuminological dissociation. He is diagnosed with Acute Inflammatory demyelinating polyradiculoneuropathy. Which of the following nerve fiber types are predominantly affected in this condition?

- a. $A\alpha$ and $A\beta$ fiber
- b. $A\delta$ and B fibers
- c. $A\delta$ and C fibers
- d. B and C fibers

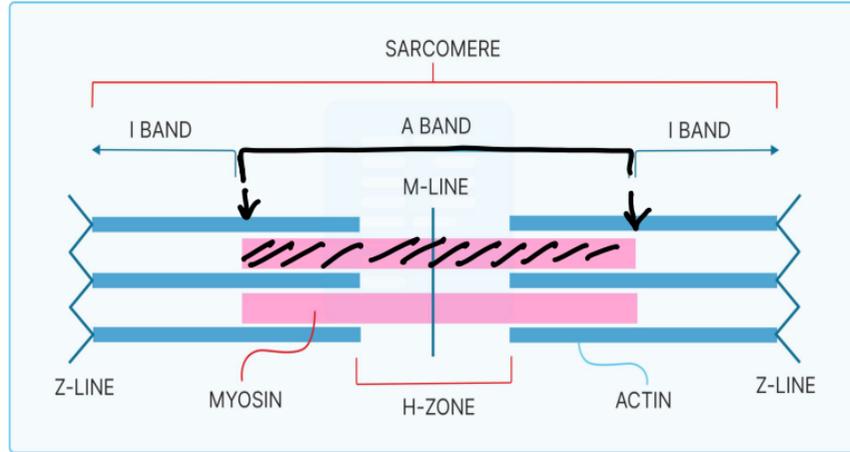
1. $K\downarrow$
* 2. GBS / AIDP

37. A 10-year-old child is having Gower sign and Pseudohypertrophy of calf muscles. He is diagnosed as having a deficiency of dystrophin protein in skeletal muscles. Which of the following best describes dystrophin? =

- a. Structural proteins
- b. Regulatory protein
- c. Contractile protein
- d. Relaxation protein

38. Which of the following is not correct about sarcomere contraction?

- a. Z lines comes closer
- b. Length I band decreases
- c. A band increases
- d. H zone decreases



39. A 25-year-old man develops generalized muscle rigidity, hyperthermia, tachycardia, and metabolic acidosis shortly after administration of halothane and succinylcholine during surgery. Malignant hyperthermia is suspected. Which of the following gene-chromosome combinations is most commonly implicated in this condition?

- (a) RYR1 gene on chromosome 19
- b. CACNA1S gene on chromosome 1
- c. DMD gene on chromosome Xp21
- d. CFTR gene on chromosome 7

L CF

* NM paralysis : ↓ Tone

" Malignant HYPERTHERMIA "

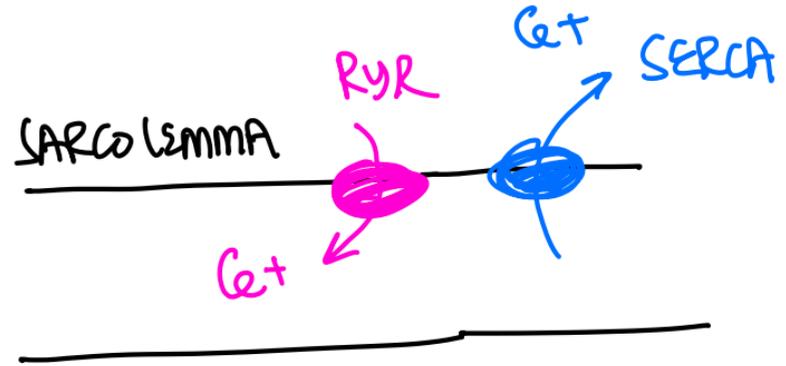
Ryanodine receptors: +++

↑↑ Ca⁺⁺ entry into muscle

> 40.5°C

* 40. Which of the following is correct about Sarco-endoplasmic reticulum Ca- ATP Ase?

- a. Skeletal muscle contraction
- b. Skeletal muscle relaxation
- c. ~~Smooth muscle contraction~~
- d. ~~Smooth muscle Tetanization~~



41. Which is **not** correct about cardiac muscle?

a. Intercalated disc ✓

b. Dense bodies *SMOOTH MUSCLE*

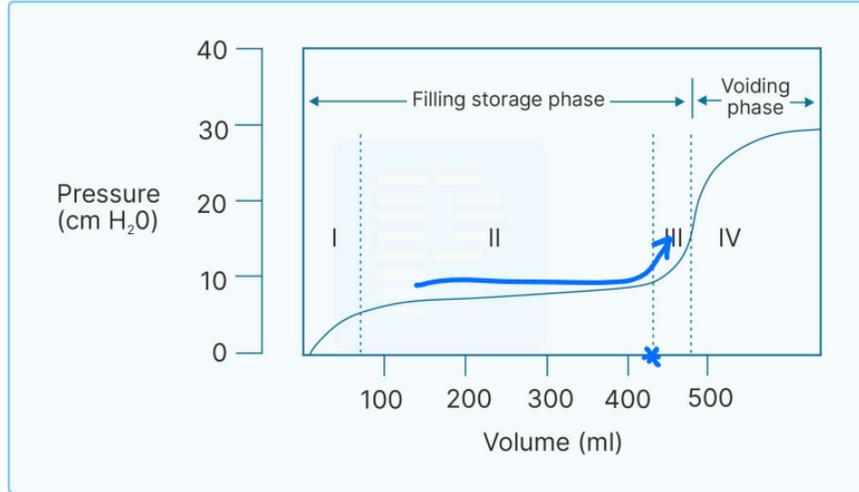
c. High myoglobin content ✓

d. Alpha MHC isoform predominates in atria and beta MHC isoform predominates in ventricles ✓

SMOOTH MUSCLE

42. Shown below is a cystometrogram that shows which of the following?

- a. Latch bridge mechanism
- b. Elasticity
- c. Plasticity**
- d. Tetanic potentiation



43. The active site of Actin is covered by?

- a. Troponin T
- b. Tropomyosin**
- c. Troponin I
- d. Troponin C

44. Which of the following is absent in smooth muscle?

a. Actin

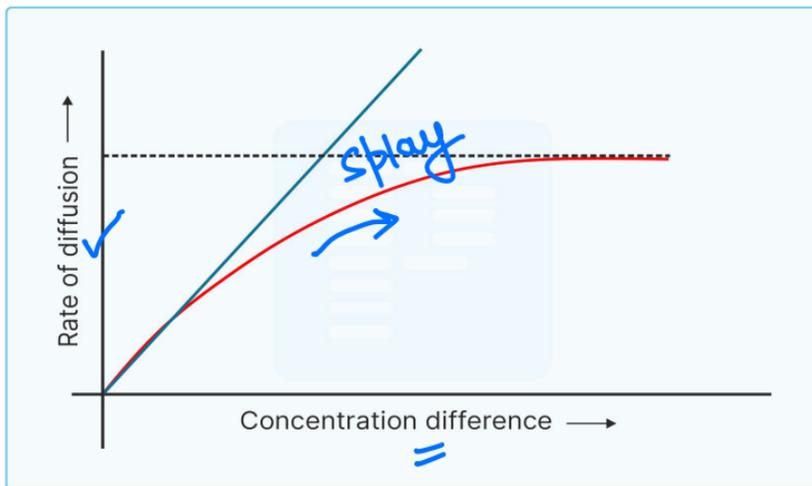
b. Myosin

c. Troponin *Cardiac muscle*

d. Tropomyosin

45. The red graph shown below is a representation of which of the following?

- a. Simple Diffusion
- b. Facilitated diffusion
- c. Non-ionic diffusion
- d. Osmosis



46. Adipose tissue contains _____?

- a. GLUT 1
- b. GLUT 2
- c. GLUT 3
- d. GLUT 4**

47. Which of the following is correct about Fick's Law?

- a. Directly proportional to membrane surface area and inverse relation to thickness of membrane
- b. Directly proportional to thickness of membrane and inverse relation to membrane surface area
- c. Directly proportional to both thickness of membrane and membrane surface area
- d. Inversely proportional to both thickness of membrane and membrane surface area

48. Na Cl cotransporter is present in distal convoluted tubule. Loss of function of this transporter leads to: =

a. Gitelman syndrome

DCT #: Na Cl cotransporter

b. Barter syndrome

TAL #: Na K⁺ Cl⁻ cotransporter

c. Gordon syndrome

gain of function: Na Cl cotransporter

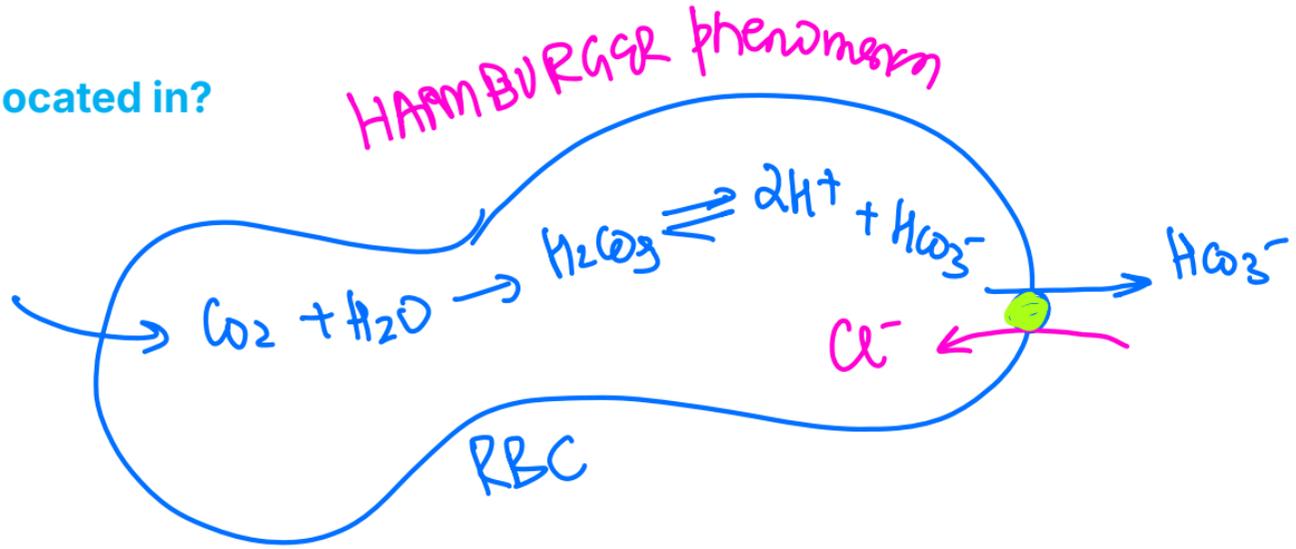
d. Liddle syndrome

ENaC: gain of action

Cl⁻ shift

49. Band 3 protein is located in?

- a. RBC
- b. WBC
- c. Platelets
- d. All of the above



Honey: neonate, Rotten Meat

50. Correct about Botulinum toxin?

- a. Cleave SNARE proteins involved in endocytosis
- b. Activate SNARE proteins involved in exocytosis
- c. Activate SNARE proteins involved in endocytosis
- d. Cleave SNARE proteins involved in exocytosis



SPASTIC WEAKNESS

51. Tetanospasmin acts by which of the following mechanisms?

- a. Cleaving synaptobrevin that inhibits release of GABA and glycine
- b. Cleaving synaptobrevin that stimulates the release of GABA and glycine
- c. Activating synaptobrevin that inhibits release of GABA and glycine
- d. Activating synaptobrevin that stimulates the release of GABA and glycine

Botulism	Tetanus
# SNARE SNAP 25	# SYNAPTOBREVIN
↓ Ach exocytosis Flaccid	⊖ release of GABA, glycine Spastic

weathers

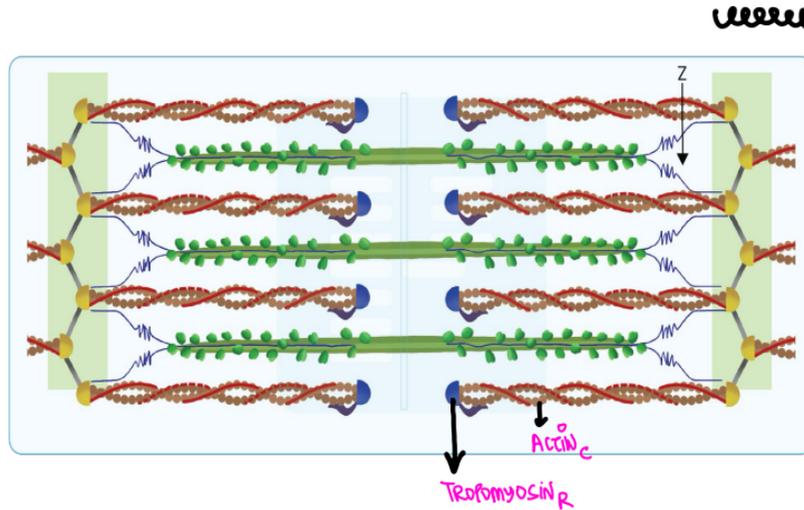
52. Endocytosis is mediated by all of the following except?

- a. Clathrin
- b. Cubilin
- c. Caveolin

(d) SNAP 25 → ACh EXOCYTOSIS

53. Identify the Z marked structure in the sarcomere

- a. Nebulin
- b. Tropomyosin
- c. Titin
- d. Actinin



Titin
STRUCTURAL

54. Purkinje cells of cerebellum are?

a. Unipolar neurons

b. Bipolar neurons → Retina

c. Pseudo-unipolar neurons

d. Multipolar neurons

glycone

55. Renshaw cells are located in?

- a. Heart
- b. Gray matter of brain
- c. White matter of brain
- d. Spinal cord**

* 56. Which of the following area of brain produces vasopressin

a. Anterior pituitary

b. ~~Posterior pituitary~~

Release

c. Median eminence

d. Hypothalamus

production

57. Which of the following is a component of visual pigment rhodopsin?

a. Retinal : VISION

b. Retinol \hookrightarrow Transport form of vit A

c. Retinoic acid \longrightarrow SKIN, SPERM maturation

d. All-trans- retinoic acid

58. Which of the following is not correct about scala media in cochlea?

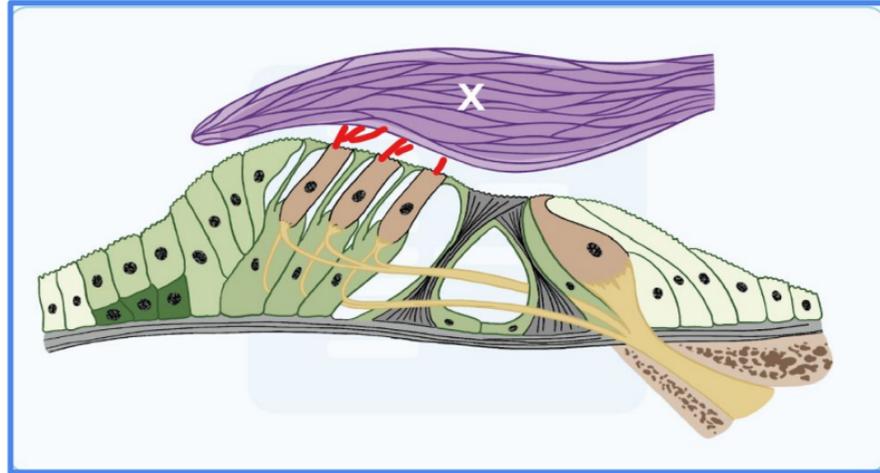
- a. Contains stria vascularis that produces perilymph
- b. Middle cochlear chamber ✓
- c. Contains organ of corti ✓
- d. Contains potassium rich fluid ✓

endolymph



59. Which is correct about the structure marked as X?

- a. Tectorial membrane
- b. Basilar membrane
- c. Reissner membrane
- d. Striae vascularis



60. Receptor for Umami sensation on tongue?

a. Epithelial sodium channel *sweet | salt*

b. GPCR T1R2

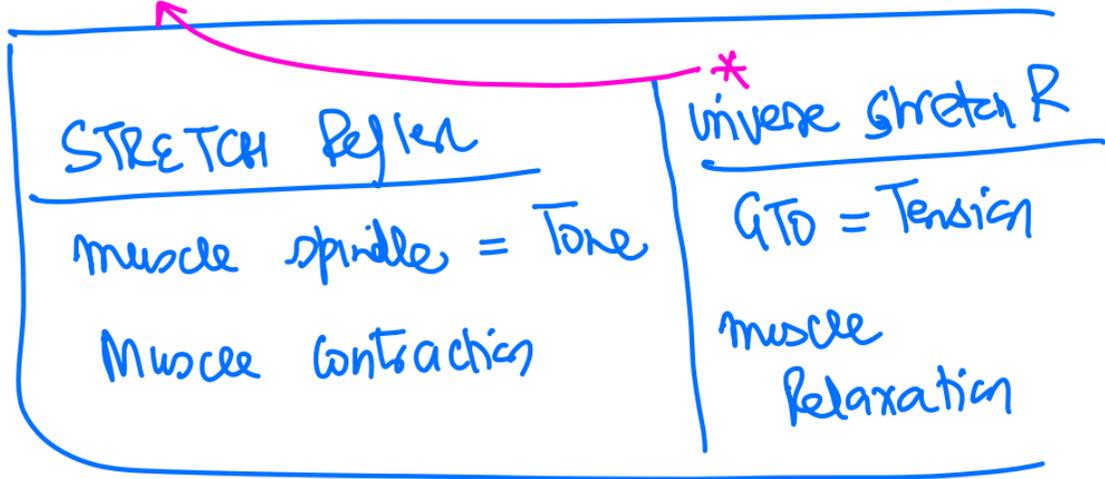
c. GPCR 2

d. GPCR mGluR4

61. Which of the following is bi-synaptic reflex

- a. Golgi tendon reflex
- b. withdrawal reflex
- c. Crossed extensor reflex
- d. Myotactic reflex

MUSCLE Relaxation



62. A wave in JVP occurs due to

- a. Atrial contraction
- b. Atrial relaxation
- c. Ventricular contraction
- d. Ventricular relaxation

63. Which of following is correct site of lesion in kluver Lucy syndrome

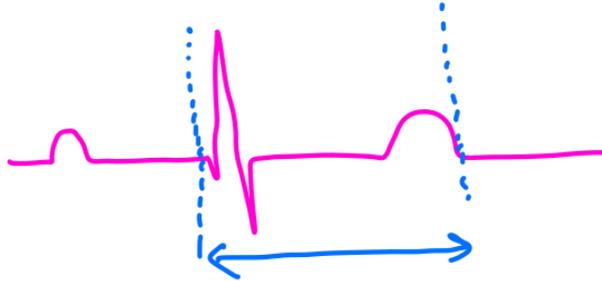
- a. Caudate nucleus
- b. Lenticular nucleus
- c. Amygdala
- d. Ventromedial thalamus

64. Which of the following is responsible for planning and programming of movements

- a. Cerebellum
- b. Basal ganglia
- c. Corticospinal pathway
- d. Reticulospinal pathway

65. Normal duration of QT interval is

- a. 0.04- 0.08 sec
- b. 0.08 -0.12 sec
- c. 0.12-0.20 sec
- d.** 0.36 -0.44 sec



66. Which of the following is called the gatekeeper of heart?

a. SA node

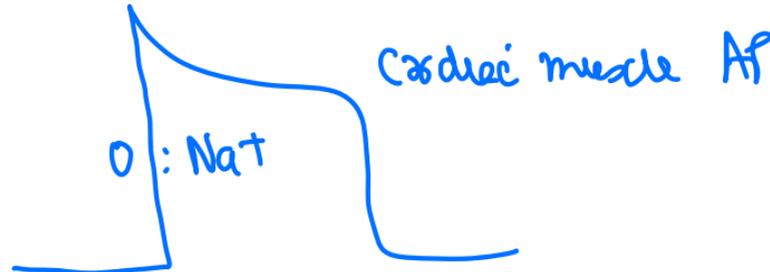
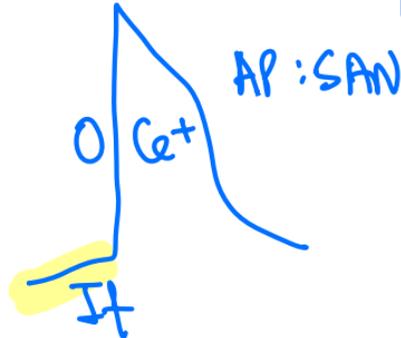
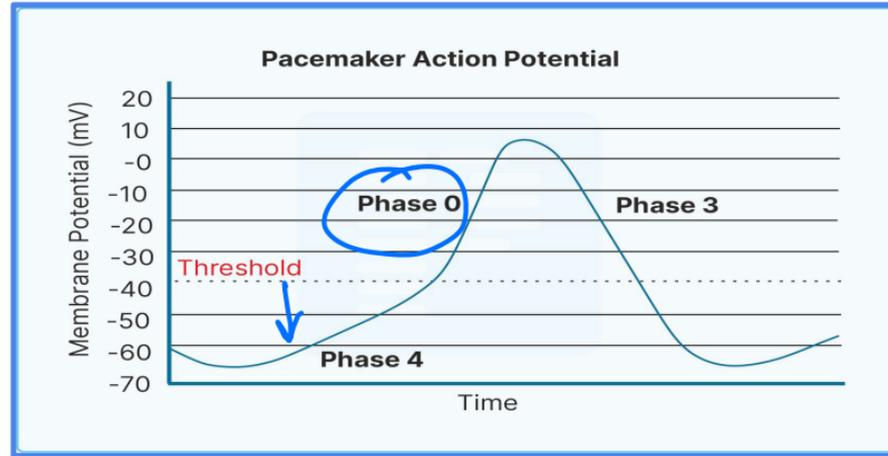
b. AV node

c. Bundle of his

d. Purkinje fiber

67. Schematic is shown for SA node pacemaker action potential. Which of the following ions play a role in phase 0 depolarization

- a. Sodium
- b. Calcium
- c. Potassium
- d. Chloride





68. In which phase of Pacemaker action potential is "Funny Current" seen?

- a. Depolarization
- b. Plateau
- c. Repolarization
- d. Hyperpolarization**

69. Hemoglobin begins to appear at which stage of erythropoiesis?

- a. Early normoblast
- b. Intermediate normoblast**
- c. Late normoblast
- d. Reticulocyte

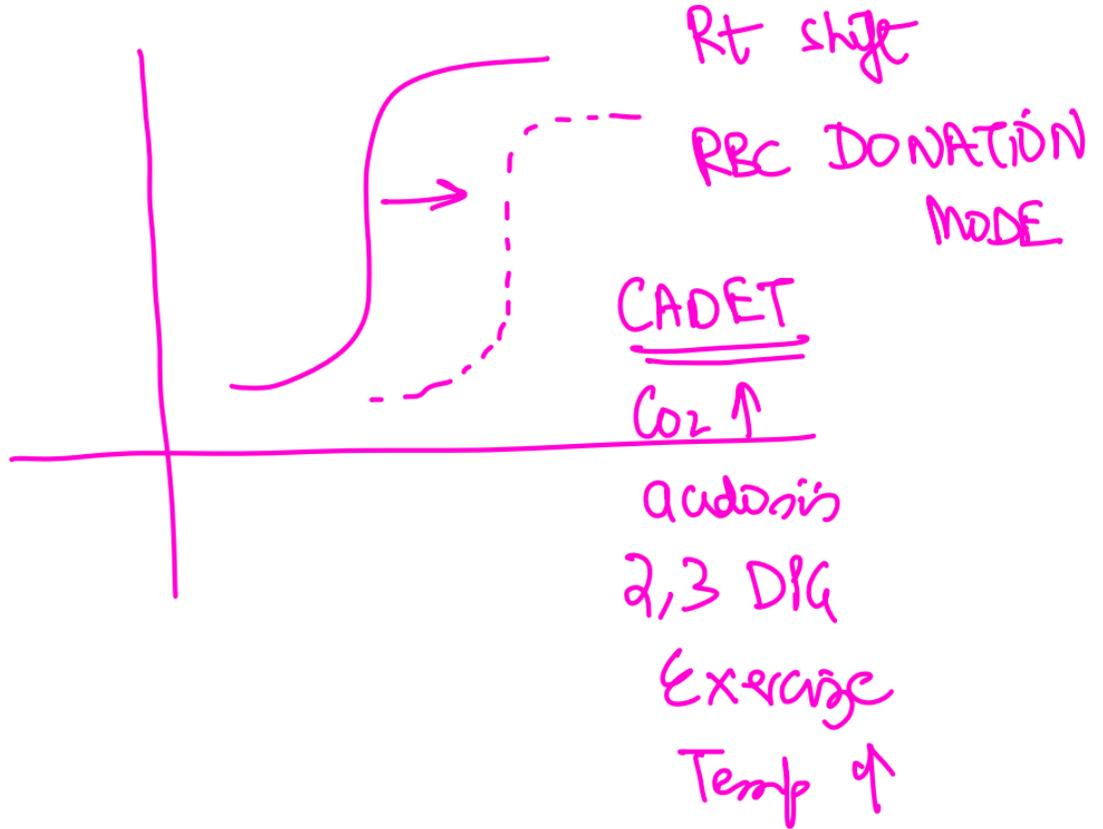
E ○ basophilic

I ○ Hb polychromatophil

L ○ eosinophilic

*70. Which of the following does not cause a rightward shift of the oxyhemoglobin dissociation curve?

- a. Increased temperature
- b. Increased 2,3-BPG
- c. Increased PCO_2
- d. Methemoglobinemia

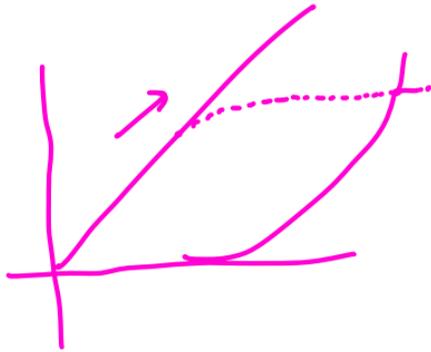
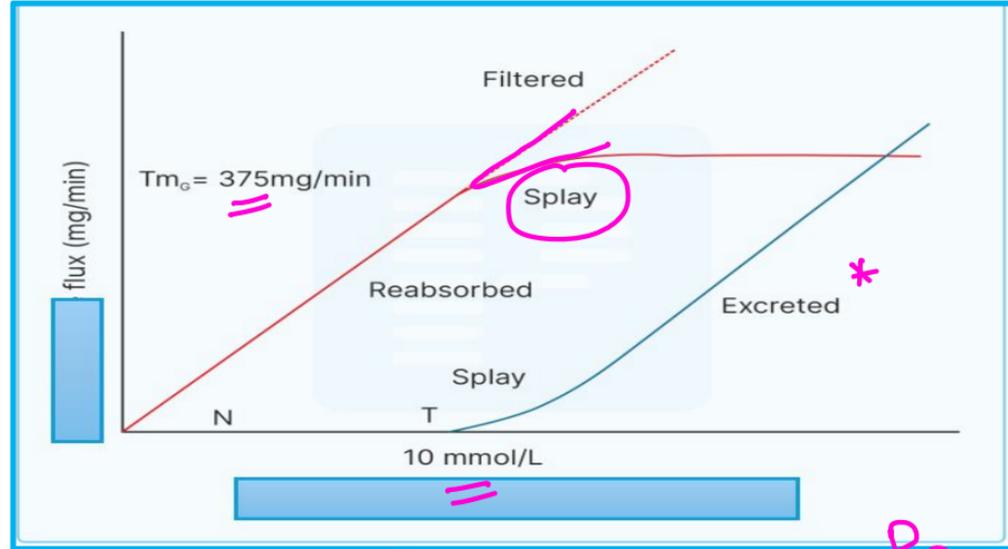


71. The Hamburger phenomenon refers to?

- a. Exchange of HCO_3^- into RBCs for Cl^- out of RBCs in venous blood
- b. Exchange of Cl^- into RBCs for HCO_3^- out of RBCs in venous blood
- c. Exchange of HCO_3^- into RBCs for Cl^- out of RBCs in arterial blood
- d. Exchange of Cl^- into RBCs for HCO_3^- out of RBCs in arterial blood

72. The following graph indicates transport of which of the following solutes through the kidney?

- a. Glucose
- b. PAH
- c. Urea
- d. Creatinine



RBS > 180 mg/dL: Renal glucosuria

73. Which of the following blood vessels has the least total cross sectional surface area?

a. Capillaries

b. Aorta

c. Veins

d. Arterioles

74. Counter current mechanism is seen at which of the following sites?

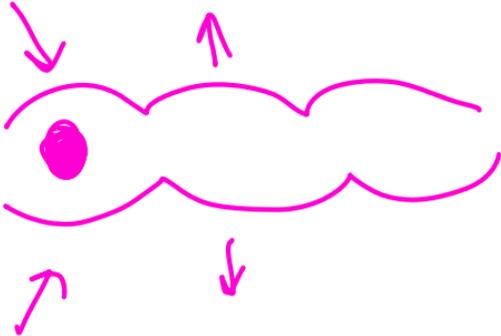
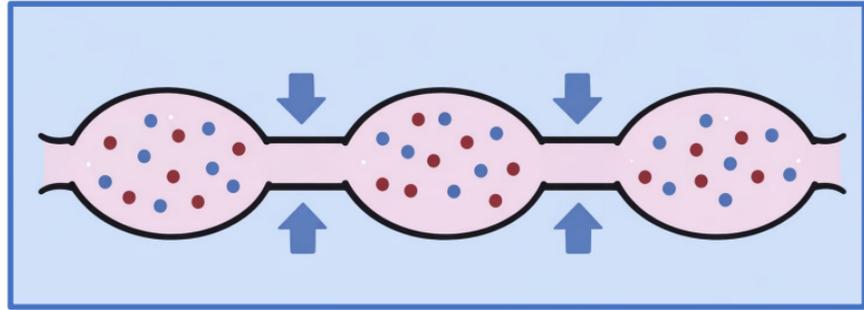
- 1. Loop of Henle ✓
- 2. Testis ✓
- 3. Skin ✓
- 4. Intestinal villi ✓

- a. 1
- b. 1, 2
- c. 1, 2, 3

d. 1, 2, 3, 4

75. The following schematic showing digestion of food products in the gut. This indicates

- a. Segmentation
- b. Peristalsis
- c. Migratory motor complexes
- d. Basal electrical rhythm



THANK YOU