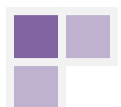


RESPIRATORY SYSTEM BASICS

1. Exchange of O₂ and CO₂ in the alveoli and blood
2. Gas exchange between blood and tissues
3. Diffusion
4. Conducting zone : Nasal/Oral cavities, trachea, bronchi, and conducting bronchi
5. Respiratory zone : Respiratory bronchioles, alveolar ducts, and alveoli
6. Gas exchange, host defense, metabolism
7. Warms and humidifies
8. Mucous lining and cilia
9. Thoracic Cavity
10. Visceral pleura, Parietal Pleura
11. Intrapleural space
12. Allow smooth lung expansion and contraction/expansion with the thoracic cavity
13. Deoxygenated blood from R. ventricle to the alveoli (pulmonary circulation)
14. Cross diffusion of gas between alveolar sacs
15. Type 1 (alveolar cells)
16. Surfactant
17. Blood from aorta to lung parenchyma cells for tissue nourishment
18. Pulmonary capillary network around alveoli
19. Oxygenated blood to the heart
20. Hilus : All but the alveoli

LUNG PRESSURE

21. P_{pul} , Pressure within alveoli
22. Inspiration (-3mmHg), Expiration (+3mmHg)
23. Positive Transmural pressure (intrapulmonary – intrapleural pressure)
24. -6 (754)
25. -3 (757)
26. Intrapulmonary pressure and atmospheric pressure
27. Drop in pulmonary pressure thus inspiration occurs
28. Compliance
29. Elasticity, during exhalation
30. Force of surface molecules per length of surface
31. P in alveolus is proportional \propto to Surface Tension and inversely \propto with radius of alveoli
32. H₂O attraction in lung fluids
33. Phospholipidsand

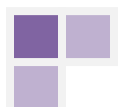


BREATHING

34. Contracting thus increasing thoracic volume vertically
35. Parasternal & external intercostals
36. Passive recoil
37. Scalenes, pectoralis minor, & sternocleidomastoid
38. Internal intercostals & abdominal muscles
39. Same as atmospheric 760 mmHg
40. Spirometer
41. Obstructive pulmonary disease (Asthma)
42. Total lung capacity, structural or functional
43. Fibrosis
44. Normal breath (500ml)
45. Air inspired past a normal breath (2100-3200 ml)
46. Air pushed out of lungs past normal breath (1000-1200ml)
47. Air in lungs after forced expiration (1200ml)
48. Total inspired air from rest
49. $P = (2 \times T) / r$:: Alveolar Pressure = (2*Resistance)/radius
50. Air in lungs after tidal expiration (RV+ERV)
51. Total exchangeable air (TV+IRV+ERV) (4700ml)
52. 6000ml
53. Dead space
54. 150ml of air in conducting respiratory passages
55. Air in alveoli that are not participating in gas exchange (alveolar dead space)
56. Sum of alveolar and anatomical dead space (total dead space)
57. Total gas flow in/out in one minute
58. Process of Deoxygenated blood passing thru lungs to become oxygenated
59. Ventilation to blood flow
60. 0.8
61. Tidal Volume X frequency (6 L/min)
62. (Tidal volume - dead space) X frequency
63. 4.2L/min : 2.4L/min
64. TLC, FRC, and RV
65. VC, TLC, FRC, and RV

FACTORS AFFECTING GAS EXCHANGE

66. Pressure that a gas in a mixture exerts independently

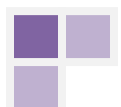


KRS STUDY GUIDES : Quiz Answers : Sarkar : "The kinkiness is gone. That's doesn't sound quite right..."

67. Total pressure is a sum of the mixture's partial pressures
68. When alveolar and blood pressure match
69. PO₂ and PCO₂ measurements
70. As Oxygen's partial pressure becomes lower, it dissolves less rapidly into blood
71. 100 mmHg, 40 mmHG
72. 46 mmHg
73. Rhythmicity center in medulla
74. PNS, sympathetic neurons
75. V, P, T, Solubility, Concentration, Surface area, thickness of membrane, capillary resistance
76. Expiratory neurons
77. Chemoreceptors
78. Low CO₂ , hypocapnia
79. Oxygen, hypoxemia
80. 4 O₂ molecules
81. Carboxyhemoglobin, oxyhemoglobin
82. Carbon dioxide (210 times stronger)
83. pH decreases, temp increases, Bohr effect
84. reduction of affinity and increased oxygen unloading
85. RBC glycolysis byproduct produced during low O₂ levels, it reduces Hb affinity (more unload)
86. Anemia
87. 2 γ-chain that does not bind to DPG (high affinity), results in oxygen rich blood for baby
88. Striated muscle
89. 1 oxygen, higher affinity
90. Left, very low PO₂
91. O₂ storage during systole

CO₂ TRANSPORT AND ACID-BASE BALANCE

92. Bicarbonate ion HCO₃⁻ (70%)
93. Carbonic anhydrase in RBC's combine CO₂ + H₂O when CO₂ levels in tissue is high
94. Hydrogen, bicarbonate ion
95. Positively, chloride shift into RBC
96. Lungs
97. O₂ binds to HB → H⁺ decreases → H bonds with HCO₃ = CO₂
98. Sigmoidal (previous bind effect subsequent power)
99. Lungs & Kidneys, 7.4 pH
100. H⁺, Bicarbonate/carbonic acid

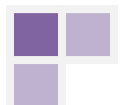


KRS STUDY GUIDES : Quiz Answers : Sarkar : "The kinkiness is gone. That's doesn't sound quite right..."

101. Kidney secretion in urine
102. Volatile (can be converted to gas), and nonvolatile (cannot leave blood)
103. $\text{pH} < 7.35$: $\text{pH} > 7.45$
104. Hypoventilation, $\uparrow \text{CO}_2$ & Carbonic acid
105. Respiratory alkalosis
106. Alkalosis
107. HCL, HCO_3
108. Carbonic acid/bicarbonate buffer

RENAL BASICS

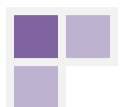
109. Volume and composition of body fluids
110. Blood fluid osmolality
111. Micturition Reflex (Urination) :: ANS
112. Reflex center of the sacral spinal cord
113. Filling of bladder till critical value, micturition reflex
114. Stretch receptors, parasympathetic neurons
115. Detrusor muscle, internal urethral sphincter
116. External urethral sphincter
117. Capillaries and outer parts of nephrons
118. Medulla, minor calyces, major calyx
119. Nephron
120. Glomerulus (capillary tuft)
121. Peritubular capillary network, vasa recta
122. Renal medulla, capillary networks
123. Podocytes, bowman's space
124. Granular cells of the afferent arteriole
125. Regulate body fluid, osmolality, v, H_2O & electrolytes, pH, produce hormones, excrete waste
126. Renin, cardiovascular, endocrine, nervous
127. Collecting tubule
128. Sodium, potassium, chloride, bicarbonate, hydrogen, calcium, and phosphates
129. Increases, more water is also absorbed
130. Aldosterone, Atrial Natriuretic Peptide (ANP)
131. Amino acids, nucleic acids
132. H^+ , HCO_3^-
133. Renin-angiotensin-aldosterone system : BP, Na, and K Balance
134. Vitamin D3



135. Re-absorption of Ca by GI tract and Ca bone deposition
136. Erythropoietin
137. ↓ perfusion p. in kidney, ↑ sympathetic n. activity, ↓ NaCl in macula densa cells
138. Proteolytic enzyme, angiotensin, angiotensin I
139. Liver
140. Angiotensin-converting enzyme, vascular endothelial cells
141. Aldosterone
142. Vasoconstriction leading to ↑ BP
143. Efferent part
144. Either efferent, or the *afferent*
145. Afferent only
146. Proximal convoluted tubule
147. Stimulates ADH secretion, thirst
148. Glomerular filtration (substances from blood filter at the membrane and filtrate enter PCT)
149. NFP = Glomerular blood hydrostatic p. – Capsular hydrostatic p. + Blood oncotic pressure
150. Pressure exerted by proteins within the blood
151. 0 (should be no proteins)
152. Slightly lower because filtrate has been lost
153. Renal vasoconstriction, hypotension, hypovolema, low cardiac output
154. Renal Blood Flow :: Intrinsic neurons, hormonal autoregulation
155. $RBF = (Aortic\ pressure - renal\ venous\ pressure) / renal\ vascular\ resistance$
156. Decreases, increases
157. Renal arteriolar vasoconstriction, decreases

RENAL TUBULES

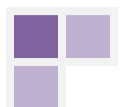
158. RBF, and GFR
159. Carry out active transport from tubule to blood
160. Na, Not effected
161. Bicarbonate
162. Filtered water, Na, Cl, K
163. Glucose, amino acids
164. Basolateral membrane, $Na^+ - K^+ - ATPase$
165. Osmotic pressure gradient (intercellular ↑) caused by solutes being absorbed
166. Proteins
167. Thick ascending, thin ascending, thin descending
168. 25%



169. Thin descending limb, ascending limb
170. Ca and HCO₃
171. Numerous mitochondria, lack microvilli
172. 8-17%, 7%
173. K⁺ and H⁺
174. ADH
175. Aldosterone
176. Aldosterone (primary), ADH (secondary)
177. Tubular Concentration of Na⁺, aldosterone, and blood concentration of K⁺
178. ↑ plasma K⁺ → aldosterone secretion → ↑ reabsorption of Na → K is secreted
179. HCO₃⁻, increases HCO₃⁻ levels
180. Changes in systemic acid-base balance
181. ↓ HCO₃⁻ or ↑ P_{CO2}, ↑ H⁺ secretion in the tubular fluid
182. PCT, NH₄⁺ and HCO₃⁻
183. NH₄⁺ enters lumen, HCO₃⁻ enters blood (for every one NH₄⁺ in urine, one HCO₃ returns for circ.)
184. Thick ascending limb, collecting tubule

RENAL CLEARANCE AND CONTROL

185. Renal clearance (secretion = ↑ clearance)
186. Inulin
187. V of plasma from which a substance is completely removed by excretion in urine
188. RPC = GFR
189. Freely filtered passively by facilitative diffusion
190. Kidneys handle a substance
191. 75 ml/min : 120 ml/min
192. 40-60%, reabsorbed (would be 120ml per min if 0% was reabsorbed...)
193. H, amino acids, urea, creatinine, some drugs
194. ADH, increases glomerular filtration
195. 25%
196. Pressure difference between renal artery and renal vein / renal vascular resistance
197. By altering vascular resistance (via Myogenic mechanism, Tubuloglomerular Feedback Mecha.)
198. Changes in Arterial pressure, intrinsic property of vascular smooth muscle
199. Changes in levels of NaCl within tubular fluid and flow rate
200. Tendency to contract upon stretching
201. 90-180
202. ↑ GFR, ↑ P_{GC}, ↓ RBF



203. \downarrow GFR, \downarrow P_{GC} , \downarrow RBF
204. Proportionally rise (no autoregulation)
205. \downarrow GFR, \downarrow P_{GC} , \uparrow RBF
206. \uparrow GFR, \uparrow P_{GC} , \uparrow RBF
207. The _____ cells of the _____ sense NaCl concentration.
208. Sympathetics, Angiotensin II, Endothelin : decrease GFR and RBF
209. JGA cells sends signals that affect _____ and thus change the GFR.
210. Prostaglandins, NO, Bradykinin, Atrial Natriuretic Peptide :: Raise GFR and RBF
211. Osmolarity and volume of fluids
212. Although it raises RBF, it has no effect on GFR
213. Hydrostatic pressure by heart pumping, osmotic pressure of the plasma protein
214. 0.2, 0.4
215. $\frac{3}{4}$
216. RBF, GFR, RPF, Na & H₂O reabsorption
217. P-aminohippuric acid
218. Adrenergic sympathetic nerves, Norepinephrine and dopamine
219. Sodium reabsorption
220. Bladder neck & urethra, contraction of bladder
221. Body of bladder, sustained bladder contraction
222. Pelvic nerve
223. Sacral pudendal nerve

