

## CRANIAL NERVES

1. What is the origin of CN 1?
2. What is the origin of CN 2?
3. What is the origin of CN 3?
4. What is the origin of CN 4?
5. What is the origin of CN 5?
6. What is the origin of CN 6?
7. What is the origin of CN 7?
8. What is the origin of CN 8?
9. What is the origin of CN 9?
10. What is the origin of CN 10?
11. What is the origin of CN 11?
12. What is the origin of CN 12?
13. The vestibularcochlear's nuclei is found on the \_\_\_\_\_ of the \_\_\_\_\_ ventricle.
14. Where does the vestibularcochlear and facial nerve exit?
15. What are the functions of the VIII nerve?
16. A lesion to the vestibular portion results in what?
17. A lesion to the cochlear portion results in what?
18. What is nystagmus?
19. What is tinnitus?
20. Is the Facial, VII, nerve motor or sensory?
21. What is the motor nucleus of the facial nerve and what does it control?
22. What is the Sensory nucleus of the facial nerve and what does it deal with specifically?
23. What is the Secretomotor nucleus of the facial nerve and what does it control?
24. What two nerves control the tongue?
25. What is a upper motor neuron lesion of the facial nerve and what does it effect?
26. What is a LMN lesion of the facial nerve and what does it effect?
27. What is a LMN lesion of the facial nerve also known as?
28. In the case of a facial nerve lesion, the effected area usually exhibits what?
29. What is a patient suspected of a facial nerve lesion asked to do?
30. The trigeminal nerve is a \_\_\_\_\_ nerve.
31. What does the motor portion of the trigeminal nerve control?
32. What trigeminal nucleus controls pain and temperature of the face and oral cavity?
33. In the trigeminal nerve, what is in charge of proprioception?
34. In nerve V, what controls Pressure and discriminatory tactile sensation and of what structures?
35. What may occur if the trigeminal nerve has a lesion?



36. Shingles is the result of \_\_\_\_\_ causing \_\_\_\_\_ pain along the \_\_\_\_\_.
37. What is sudden unilateral severe sharp stabbing pain along the distribution of the nerve?
38. In a nerve V lesion, what side does the jaw deviation occur on and why?
39. The abducent #\_\_ nerve is a (motor/sensory) nerve.
40. Where is the nucleus and exit of the abducent?
41. What is the function of the abducent? Ipsi or contralateral control?
42. What is the failure to move eyes laterally?
43. What does the reticular formation control and a lesion of it may cause what?
44. A lesion to the corticospinal tract of the pons results in what?
45. A lesion to the corticobulbar tract or nucleus of the pons results in what?
46. A lesion to the medial lemniscus of the pons results in what?
47. The Bell-Magendie Law states what?
48. What is proreception?
49. What cranial nerves are associated with the midbrain?
50. What raises the superior eyelid?
51. What nerve innervates the superior oblique?
52. What nerve innervates the Lateral recti muscle?
53. Unless noted, what muscle innervates an eye muscle?
54. The Oculomotor has 2 nuclei at the level of the \_\_\_\_\_ in the \_\_\_\_\_.
55. What nuclei of the oculomotor innervates the ciliaris and sphincter papillae?
56. What occurs when light is shown on the eye pupil causing contraction?
57. What is the only nerve to exit dorsally?
58. What is the focusing thickening adjustment of the ciliaris called?
59. What is diplopia?
60. Why does diplopia occur?
61. What is mydriasis?
62. What causes mydriasis?
63. What is cycloplegia and what do you lose with it?
64. The nucleus of the Trochlear nerve lies in the \_\_\_\_\_ at the level of the \_\_\_\_\_.
65. What is lost when the oculomotor nerve is lesioned?
66. What is lost when the trochlear nerve is lesioned?
67. Where does the Trochlear nerve decussate?
68. The nucleus of the abducent nerve is in the \_\_\_\_\_ beneath the \_\_\_\_\_.
69. A lesion of the abducent #\_\_ nerve results in \_\_\_\_\_ and \_\_\_\_\_.
70. Refer to [CranialNerves.doc](#) for complete CN information.



## NEUROEMBROLOGY

71. What occurs in the first week?
72. What occurs in the second week?
73. What three things occur in the third week?
74. During gastrulation, the \_\_\_\_\_ develops in the \_\_\_\_\_.
75. The primitive groove becomes the \_\_\_\_\_ and moves down displacing the \_\_\_\_\_.
76. Gastrulation results in the trilaminar disk, the components are \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
77. The remaining epiblast from gastrulation is the \_\_\_\_\_.
78. The \_\_\_\_\_ condensing along the primitive streak forming \_\_\_\_\_ and \_\_\_\_\_.
79. As the notochordal process becomes the notochord, they stimulate what tissue change?
80. The neural plate is derived from the \_\_\_\_\_.
81. The notochord is derived from the \_\_\_\_\_.
82. The notochord and the prechordal plate approximate to form what over the notochord?
83. What is neurulation?
84. The neural plate gives rise to \_\_\_\_\_.
85. The neural crest cells gives rise to \_\_\_\_\_.
86. Persistence of mesenchyme formation, thus a lack of \_\_\_\_\_, results in \_\_\_\_\_.
87. The neural plate invaginates and closes forming what?
88. The neural tube \_\_\_\_\_ of somites form the spinal cord; it has \_\_\_\_\_ walls and a \_\_\_\_\_ tube.
89. What forms the brain?
90. What forms the ventricular system?
91. During neurulation, where do the neural crest cells form and where do they end up?
92. What are trunk structures are derived from the neural crest?
93. Neural tube cells form \_\_\_\_\_ cells, which in turn the neural tube into 3 stratified layers.
94. What are the three layers of the neural tube?
95. Which neural tube plate produces the dorsal horn? The ventral horn? What separates them?
96. During the 4th week, the DRG forms from the \_\_\_\_\_, eventually resulting in what key structure?
97. For pathway formation, the medial branches from the DRG may \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
98. What is the failure of the neural folds to fully differentiate?
99. What are the 3 primary vesicles?
100. The forebrain becomes what 2° structures? What does each structure ultimately become?
101. The midbrain becomes what 2° structures? What does each structure ultimately become?
102. The hindbrain becomes what 2° structures? What does each structure ultimately become?
103. Failure to close what at 26 days may result in spina bifida?
104. Failure to close what at 24 days may result in \_\_\_\_\_?
105. What is found in the mature ventricular system? What is it made of?



106. Choroid plexus helps in the production of what?
107. \_\_\_\_\_ and \_\_\_\_\_ form the choroid plexus; together they are known as \_\_\_\_\_.
108. What is hydrocephalus?
109. What is obstructive hydrocephalus?
110. What is aqueductal stenosis?
111. What marks the cranial end of the neural tube?

### BASAL GANGLIA MOTOR SYSTEM CONTROL

112. \_\_\_\_\_ is associated with the deep tendon reflex to prevent \_\_\_\_\_ injury.
113. \_\_\_\_\_ is associated with the tension of muscle to prevent \_\_\_\_\_ injury.
114. Where and what is the golgi tendon organ?
115. What synapses with the Ib interneuron?
116. What does the inhibitory Ib interneuron do?
117. What is the flexion and crossed extension reflex?
118. The nucleus gracilis and cuneatus give rise to \_\_\_\_\_, decussate to \_\_\_\_\_, end up as \_\_\_\_\_.
119. From the ventral posterior lateral thalamic nucleus the fibers run where?
120. How is the deep sensibility tract examined?
121. Where does proprioception come from?
122. What tracts are involved in pain & temp regulation? What are they collectively known as?
123. Describe the pathway of the spinothalamic tract all the way to the somatosensory cortex.
124. How is the pain and temperature tracts examined?
125. What are the 6 general structures of the Basal ganglia?
126. What individual structures are located in the Lentiform nucleus?
127. Where is the head of the caudate nucleus located?
128. Where is the tail of the caudate nucleus located?
129. What are the individual entities of the Substantia Nigra, and what does each secrete?
130. What exactly is the corpus striatum?
131. What is comprised of the head of the caudate nucleus and the putamen?
132. In the basal ganglia cortex excite/inhibit pathways, the cortex secretes \_\_\_\_\_ form area \_\_\_\_\_.
133. What area of the cortex is excited/inhibited by the thalamus?
134. What are the nuclei of the thalamus stimulated by globus pallidus I & II?
135. Excitation of area 6 and the supplementary cortex results in what?
136. What are the hypokinetic disorders?
137. The largest group of hyperkinetic disorders are dyskinesias, name the subtypes of dyskinesia.
138. What may be the cause of parkinson's disease?
139. What are possible treatments of parkinson's?



140. What are the symptoms of Parkinsons?
141. What is Huntington's disease?
142. What are the symptoms of Huntington's Disease?
143. How soon after onset do patients normally die from Huntington's Disease?
144. What is chorea?
145. What is Sydenham's Chorea?
146. What is athetosis?
147. What is ballism?
148. What is Wilson's Disease.
149. What are some symptoms of Wilson's Disease?
150. What is an injury of the lentiform nucleus resulting in co-contractions called?
151. What is torticollis?
152. What is an upper eyelid focal dystonia (twitch) called?
153. What can be seen in a brain horizontal in a patient with Wilson's Disease?
154. What are the cortical association areas?
155. What do the cortical association areas and basal ganglia do?
156. What was the target of the thalamus in the direct/indirect pathways?
157. What is the primary motor cortex?
158. What is the function of the cerebellum and motor cortex in motor control?
159. What areas are located in the postcentral gyrus?
160. What are the two descending pathways for the execution of movement?
161. Where is the lateral pathway located and what tracts are included in it?
162. The lateral pathway influences motor neurons that innervate \_\_\_\_\_.
163. The medial pathway influences motor neurons that innervate \_\_\_\_\_.
164. Why do we mainly see lower face systems?
165. UMN lateral corticospinal tract goes from the motor cortex to the distal flexors. Map it.
166. Rubrospinal tract begins with the \_\_\_\_ nucleus, crosses in the pons and innervates the \_\_\_\_\_.
167. What are the symptoms of lateral pathway injury?
168. What tract tends to overtake most of the rubrospinal tract function?
169. The Pontine Reticulospinal tract begins in the \_\_\_\_ and ends in the \_\_\_\_\_.
170. What does the pontine reticulospinal tract innervate?
171. Where does the medullary reticulospinal tract begin and end?
172. What is the purpose of the medullary reticulospinal tract?
173. Where does the vestibulospinal tract begin and end?
174. What is the purpose of the vestibulospinal tract?
175. What is the path of the tectospinal tract?



176. What is the purpose of the vestibulospinal tract?
177. What tracts would be lost with a lesion to the vestibular nuclei?
178. What is decerebrate rigidity? What also needs to be cut to reduce it? Stop it?
179. What is decorticate rigidity?
180. What tracts tend to cancel each other out therefore they cannot prevent the 2 rigidities?
181. Why is there in no tonic extension in the arms with decorticate rigidity?
182. In the ventral horn, extensors tend to be \_\_\_\_\_ placed, and distal muscles \_\_\_\_\_ placed.
183. Extrafusal muscles (power generating) are innervated by \_\_\_\_\_ neurons.
184. What are intrafusal muscles and what are they innervated by?
185. What is a muscle fasciculation?
186. What is a muscle fibrillation?
187. What is a muscle spindle comprised of?
188. What is the purpose of the  $\gamma$  innervated intrafusal muscles?
189. The proprioceptors of the muscle spindle send info to the \_\_\_ & \_\_\_.
190. What type of fibers in the muscle spindle detect muscle stretch?
191. What is a dynamic intrafusal fiber?
192. What is a static intrafusal fiber?
193. The dynamic & static intrafusal fibers are subtypes of what group?
194. Describe the stretch reflex.
195. The Ia inhibitory interneuron inhibits the \_\_\_\_\_.
196. What prevents the over-excitation of muscles around a joint?
197. Specifically, what does the Renshaw inhibitory cell do?

### LIMBIC SYSTEM

198. What structures are found in the limbic lobe?
199. In addition to the limbic lobe, what structures are found in the limbic system?
200. What are the components of the hippocampal formation?
201. What is the function of the hippocampus?
202. What is the order of projection (efferent route) of the hippocampal formation?
203. Afferents enter the hippocampal formation from what sources?
204. The afferents from the hippocampal commissure arrive from what place?
205. The entorhinal area of the parahippocampal gyrus is part of what cortex?
206. A lesion to the hippocampal formation would result in what?
207. Where are the cell bodies of the hippocampus found?
208. What are the subtypes explicit memory? What is it also known as?
209. Where is explicit memory found (aside of hippocampal formation)?



210. What are the types of implicit memory?
211. All sensory information hits the \_\_\_\_\_ before it goes to its proper cortex.
212. Priming occurs in the \_\_\_\_\_, and procedural memory in the \_\_\_\_\_.
213. Where do emotional responses to associative learning occur? Musculoskeletal responses?
214. Efferents from the Amygdala travel via the \_\_\_\_\_ to \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
215. What type of information converges upon the amygdala?
216. What is the function of the amygdala?
217. Overstimulation of the limbic system may result in what?
218. What are the limbic system syndromes/diseases?
219. What is the lesion of Kluver Bucy Syndrome?
220. What are the results of Kluver Bucy Syndrome?
221. The senile plaques containing an \_\_\_\_ are found in the \_\_\_\_ and \_\_\_\_ cortices of Alzheimer's.
222. What are the symptoms of Temporal lobe epilepsy?
223. What is the function of the septal area?

#### HEARING

224. Sound below 20Hz is known as \_\_\_\_\_, above 20kHz \_\_\_\_\_.
225. What are the muscles of the inner ear? What are they innervated by?
226. The cochlea spirals around what?
227. Malleus : Make ossicles more rigid to protect against loud sounds
228. Why do sudden loud sounds hurt?
229. How does the middle ear amplify the sound pressure 22 times?
230. Displaced by the stapes, the \_\_\_\_\_ causes \_\_\_\_\_; any unabsorbed energy distorts the \_\_\_\_\_.
231. The membranes are located at the \_\_\_\_\_.
232. Where is the basilar membrane thicker?
233. Extracellular space of detector cells contain \_\_\_\_\_.
234. The Scalas Vestibuli (SV) and Scalas Tympani (ST) contain \_\_\_\_\_, which is rich in \_\_\_\_\_.
235. Name in order the spaces & structures of the cochlea.
236. The SM contains \_\_\_\_\_, which is rich in \_\_\_\_ due to the \_\_\_\_\_ secreting  $K^+$  while \_\_\_\_\_.
237. What are the sensory cells on the basilar membrane?
238. How is sound coded in the basilar membrane?
239. The basilar membrane is wide at the \_\_\_\_\_ of the cochlea.
240. Organ of Corti contains \_\_\_\_\_, \_\_\_\_\_ cells, and \_\_\_\_\_ cells.
241. Organ of Corti sits on the \_\_\_\_\_ & is covered by the \_\_\_\_\_.
242. What produces the receptor potential?
243. Which hair cells have stereocilia extending into the tectorial membrane?



244. Inner hair cells synapse with the \_\_\_\_\_ whose axons form the \_\_\_\_\_.
245. Which hair cells are distal to the pillar cells?
246. What happens when stereocilia bend due to upward movement?
247. Downward movement of the basilar membrane causes \_\_\_\_\_.
248. How do we know that outer hair cells may deal with amplification?
249. How many spiral ganglion cells are there?
250. Spiral ganglion cells form the \_\_\_\_\_ and later synapse with the \_\_\_\_\_.
251. Each fiber of the spiral ganglion holds a specific frequency, thus is has \_\_\_\_\_.
252. What type of cells are in the ventral cochlear nuclei and what do they do?
253. What type of cells are in the dorsal cochlear nucleus and what do they do?
254. If you lesion one side after the cochlear nuclei what would result?
255. How is horizontal localization achieved?
256. When is interaural time delay the most striking? Ineraural intensity?
257. In addition to round window distention, how are echos avoided?
258. Intensity difference between the two ears is detected by the \_\_\_\_\_.
259. The cochlear n. fibers synapse \_\_\_\_\_ with the \_\_\_\_\_, who's fibers form the \_\_\_\_\_.
260. Some fibers from the lateral lemniscus synapse with the \_\_\_\_; most synapse with the \_\_\_\_.
261. Describe the Inferior colliculus.
262. The \_\_\_\_\_ holds a complete \_\_\_\_\_ and receives fibers from the inf. Colliculus.
263. What is the primary auditory cortex?
264. Conductive hearing loss results from \_\_\_\_\_.
265. Sensorineural hearing loss results from \_\_\_\_\_.
266. What does otosclerosis result in?
267. Otis media results from \_\_\_\_\_.
268. The T.T.G. of Heschl is \_\_\_\_ organized and is the second point of what?
269. Where is the tuning fork placed in Weber's test?
270. Sound lateralization in Weber's could mean \_\_\_\_ or \_\_\_\_\_.
271. Where is the tuning fork placed in Rinne's test?
272. After the fork is moved, and the patient cannot hear it \_\_\_\_\_ loss is suspected.
273. For Rinne's, if time of hearing significantly differs between ears \_\_\_\_\_ loss is suspected.

#### VESTIBULAR SYSTEM

274. What is the labyrinth composed of?
275. The bony labyrinth contains \_\_\_\_\_ and is continuous w/ the \_\_\_\_\_.
276. The membranous labyrinth communicates with the \_\_\_\_\_.
277. What does the endolymphatic sac continually absorb?



278. The vestibular system helps with \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
279. In the static labyrinth, the hair cells are called the \_\_\_\_\_ and \_\_\_\_\_.
280. What are the static hair cells embedded in and what does it change?
281. The static labyrinth is comprised of \_\_\_\_\_ and detect \_\_\_\_\_.
282. The semicircular canals can detect all possible direction of movement, how?
283. The kinetic labyrinth, which detects \_\_\_\_\_, contains the \_\_\_\_\_.
284. What are the labyrinth hair cells and where are they located?
285. The crista ampullaris is embedded in the \_\_\_\_\_.
286. \_\_\_\_\_ influx causes vestibular hair cell depolarization.
287. Vestibular hair cells have \_\_\_\_\_ on one end, and \_\_\_\_\_ on the other end.
288. When Microvilli \_\_\_\_\_ the cell will depolarize.
289. When does the cell hyperpolarize?
290. V. receptors synapse with \_\_\_\_\_ cells of the \_\_\_\_\_ whose axons form the \_\_\_\_\_.
291. Where does the vestibular nerve enter the brainstem?
292. What three places does the vestibular nuclei project?
293. Fibers from the vestibular n. may also ascend to the \_\_\_\_\_ and from there to the \_\_\_\_\_.
294. Why does Internuclear Ophthalmoplegia occur in a MLF lesion?
295. With what diseases is Internuclear Ophthalmoplegia often seen?
296. Describe the Barany Chair test.
297. What is the result of the Barany Chair test in an intact system?
298. Describe Caloric Testing.
299. What are the symptoms of a Vestibular lesion?
300. How can you tell a central vestibular lesion from a peripheral vestibular lesion?
301. What is Meniere's Disease?
302. An acoustic neuroma is \_\_\_\_\_ and usually found at \_\_\_\_\_.
303. An acoustic neuroma may also effect what nerves?

#### CHEMICAL SENSES

304. Most odors that we can smell are \_\_\_\_\_.
305. Where is the olfactory epithelium?
306. What makes the olfactory unique sensory tissue?
307. Olfactory receptor cells are \_\_\_\_\_ whose \_\_\_\_\_ form the \_\_\_\_\_.
308. What helps to trap odorants?
309. The olfactory nerve travels & synapses with the \_\_\_\_\_ cells of the \_\_\_\_\_.
310. What ion movement depolarizes the olfactory cell?
311. Bulb fibers proceed into the \_\_\_\_\_ and divides into the \_\_\_\_\_.



312. What makes up the primary olfactory cortex?
313. Olfaction is the only sense to \_\_\_\_\_.
314. The piriform cortex relays information to the \_\_\_\_\_ and \_\_\_\_\_.
315. What is the primary olfactory association cortex?
316. The facial nerve has what branch/nerve receiving information from the tongue?
317. What cranial nerves synapse in the \_\_\_\_\_ nucleus for taste?
318. Name the ganglion for each CN of taste.
319. Afferents of the solitary nucleus synapse with the \_\_\_\_\_ travel thru the \_\_\_\_\_ to the \_\_\_\_\_.
320. Where is the primary gustatory cortex located?
321. Gustatory afferents are \_\_\_\_\_.
322. How is a salty taste sensation generated?
323. How is a sour taste sensation generated?
324. How is a sweet taste sensation generated?
325. How is a bitter taste sensation generated?
326. How is a umami taste sensation generated?

