

FUNCTIONAL HUMAN NEUROANATOMY
EXAMINATION II APRIL 3, 2008

Part I. Please choose the BEST answer.

1. The corticospinal tract travels in the _____ region of the internal capsule.
 - a. anterior
 - b. posterior
 - c. genu
 - d. lateral

2. Which is not a descending tract in the upper medulla?
 - a. pyramids
 - b. tectobulbospinal
 - c. MLF
 - d. medial lemniscus

3. Which nucleus is not found in the upper medulla?
 - a. red nucleus
 - b. nucleus solitarius
 - c. dorsal motor X
 - d. nucleus ambiguus

4. The taste of fresh mango stimulates what cells in the upper medulla?
 - a. nucleus ambiguus
 - b. lateral reticular nucleus
 - c. nucleus solitarius
 - d. dorsal motor nucleus of X

5. A lesion in the hypoglossal nerve would cause
 - a. loss of taste
 - b. atrophy of the tongue muscles
 - c. spasticity of the tongue muscles
 - d. all upper motor neuron lesion symptoms

6. What percent of fibers cross in the lateral corticospinal tract?
 - a. 75-90%
 - b. 45-60%
 - c. 30-49%
 - d. none of the above

7. What sensations are not carried in the middle medulla?
 - a. pain and temperature on the contralateral side of the body
 - b. conscious proprioception on contralateral side of the body
 - c. protopathic touch on the contralateral side of the body
 - d. epicritic touch on the ipsilateral side of the body

8. What is a characteristic feature of the lower midbrain?
 - a. the oculomotor nucleus
 - b. the abducens nucleus
 - c. main sensory V nucleus
 - d. the decussation of the brachium conjunctivum (superior cerebellar peduncle)
9. Which structure might not be affected when the posterior inferior cerebellar artery is blocked?
 - a. substantia nigra
 - b. nucleus ambiguus
 - c. nucleus solitarius
 - d. part of VII, IX and X nuclei
10. What is the function of the medial longitudinal fasciculus, MLF?
 - a. visual tracking through coordinated movement of eyes, head, neck and trunk
 - b. affects basal ganglia tremors
 - c. alters inferior collicular activity
 - d. influences nucleus solitarius
11. Which of the following does not have a direct effect on motor functions?
 - a. nucleus ambiguus
 - b. abducens nucleus
 - c. spinal V or spinal trigeminal
 - d. IX cranial nerve
12. Which is not found in the tegmentum of the pons?
 - a. abducens nucleus and facial nucleus
 - b. main sensory V and motor V
 - c. superior olivary nucleus
 - d. trochlear nucleus
13. Which pair is not correct?
 - a. medial lemniscus – conscious proprioception
 - b. lateral lemniscus – hearing
 - c. trigeminal lemniscus – pain and temperature
 - d. superior lemniscus – vision
14. If lesioned, what destroys the functional integrity of the whole reticular formation?
 - a. subcommissural organ
 - b. thalamic tegmentum reticular core
 - c. midbrain tegmentum reticular core
 - d. medullary tegmentum reticular core

15. Rostral to the superior colliculus is the _____ which integrates visual reflex functions.
- posterior ventral lateral thalamic nucleus
 - optic tract
 - subcommissural organ
 - pretectal organ
16. Which answer is correct regarding relationships to the thalamus?
- the body of the lateral ventricle is medial
 - cerebral cortical area 4 is inferior
 - internal capsule is lateral
 - interventricular foramen is posterior
17. The anterior nucleus of the thalamus receives input from hypothalamic mammillary bodies and projects to the cingulate gyrus influencing what functions?
- unconscious proprioception
 - memory and emotions
 - visual reflexes
 - reduction of pain
18. A lesion in the dorsomedial nucleus of the thalamus might not manifest this symptom?
- reduced anxiety
 - emotional experiences
 - personality changes
 - contralateral hemiplegia
19. Heschl's gyrus (area 41) receives fibers predominately from the
- ventral lateral nucleus of the thalamus
 - red nucleus
 - substantia nigra
 - medial geniculate body
20. The cerebellar input to the cerebral cortex comes from the _____ nucleus of the thalamus.
- dorsal medial
 - ventral anterior
 - ventral lateral
 - lateral geniculate body
21. A test for protopathic touch (crude) sensations uses
- two pin pricks spaced at various distances apart
 - a cold object
 - a wisp of cotton
 - pressure from a finger

22. Sharp localization for touch (epicritic) is carried in which pathway in the spinal cord?
- lateral funiculus
 - anterior funiculus
 - posterior funiculus/dorsal columns
 - lateral spinothalamic tract
23. Which sensation is NOT found in the anterior spinothalamic tract?
- tickling
 - lustful feelings
 - unconscious proprioception
 - itching
24. Which thalamic nucleus receives the greatest variety of sensory input?
- lateral geniculate body
 - medial geniculate body
 - posterior ventral lateral nucleus
 - posterior ventral medial nucleus
25. Which is NOT correct for the posterior spinocerebellar tract?
- coordinates muscles to maintain posture
 - carries input to the cerebellum from the upper extremity
 - carries unconscious proprioception for fine movement
 - deals with individual muscle movement
26. Which is NOT correct for the posterior spinocerebellar tract?
- secondary neurons rise from Clarke's column
 - secondary neurons end as mossy fibers on cerebellar granular cells
 - synapses in the external accessory cuneate nucleus
 - arises from cells in the base of the posterior horn
27. A Brown-Sequard syndrome would NOT include which of the following:
- ipsilateral hemiplegia ✓
 - contralateral reduced pain and temperature ✓
 - contralateral conscious proprioception ✗
 - ipsilateral epicritic touch ✓
28. Which is NOT correct for Brodmann's Area 4?
- contains large pyramidal Betz cells which serve as antigravity inhibitory neurons to the posterior thigh muscles
 - primary sensory area
 - produces highly skilled movements
 - lacks identifiable layer IV, creating an agranular cortex

29. The corticobulbar tract provides motor input to the

- a. superior colliculus
- b. oculomotor nucleus
- c. lateral geniculate body
- d. pulvinar

30. Which combination of areas of Brodmann do NOT take part in the cortical spinal tract?

- a. 1,3,4,5
- b. 3, 17, 41, 39
- c. 3,4,6,5
- d. 1,2,5,6

31. What is NOT correct about the superior colliculus?

- a. receives fibers from the retina
- b. receives fibers from area 8 for conjugate eye movements
- c. sends fibers to the posterior thalamus, the pulvinar
- d. consists of three major nuclei

32. The main afferent fibers to the inferior colliculus are the

- a. medial lemniscus
- b. trigeminal lemniscus
- c. lateral lemniscus
- d. spinal V tract

33. The subcommissural organ

- a. is caudal to the cerebral aqueduct
- b. regulates visual reflexes
- c. regulates water intake
- d. is posterior to the posterior commissure

34. The main sensory ganglion of the Vth nerve, the semilunar or Gasserian ganglion, is found

- a. adjacent to the pons
- b. lateral to the sella turcica
- c. in the interpeduncular fossa
- d. in the cerebello-pontine angle

35. Which is NOT correct regarding the locus ceruleus?

- a. it supplies serotonin to the whole brain
- b. it is found ventral medial to mesencephalic V
- c. it supplies ^{nor}epinephrine to the whole brain
- d. it plays a role in sleep and wakefulness

36. What makes the mesencephalic nucleus of the Vth cranial nerve different from any other nucleus in the brain stem?
- it receives fibers dealing with temperature sensations
 - its fibers create the facial colliculus
 - it contains pseudounipolar cells inside the CNS
 - it supplies the lateral rectus eye muscle
37. Which structure is not related to the trapezoid body?
- inferior colliculus
 - lateral lemniscus
 - inferior olivary nucleus
 - superior olivary nucleus
38. If the dorsal motor nucleus of X is motor to the thoracic and abdominal viscera, what nucleus receives the sensory input from the thoracic and abdominal viscera?
- nucleus ambiguus
 - lateral reticular nucleus
 - spinal trigeminal nucleus
 - nucleus solitarius
39. A dermatome is an area of skin supplied by
- the glossopharyngeal nerve
 - branching neuronal axons entering two cord segments
 - a single sensory nerve associated with a single cord segment
 - trochlear nerve
40. Which nuclei are related to the internal arcuate fibers in the medulla?
- inferior trapezoid nucleus
 - red nucleus
 - superior colliculi
 - gracile and cuneate nuclei

II. From 41 to 50 mark A B or C as your best answer

41. A. descending white matter
B. ascending white matter
C. corona radiata
42. A. external capsule
B. extreme capsule
C. internal capsule
43. A. cerebral peduncle
B. pontine peduncle
C. midbrain peduncle

44. A. medial cortical spinal tract
B. decussation of pyramids
C. decussation of voluntary motor tracts
- ✓ 45. A. nucleus solitarius
B. abducens nucleus
C. dorsal motor X
- ✓ 46. A. spinal trigeminal
B. nucleus ambiguus
C. facial nucleus
- ✓ 47. A. hypoglossal nucleus
B. medial vestibular nucleus
C. medial longitudinal fasciculus
48. A. tectospinal tract
B. decussation of the pyramids
C. decussation of medial lemniscus
49. A. posterior spinocerebellar tract
B. lateral corticospinal tract
C. rubrospinal tract
- ✓ 50. Which artery mainly supplies the hatched area?
A. pontine artery
B. vertebral artery
C. basilar artery

HAVE SELF RESPECT, SELF CRITICISM, AND DO SOMETHING FOR SOMEONE ELSE
EACH DAY.

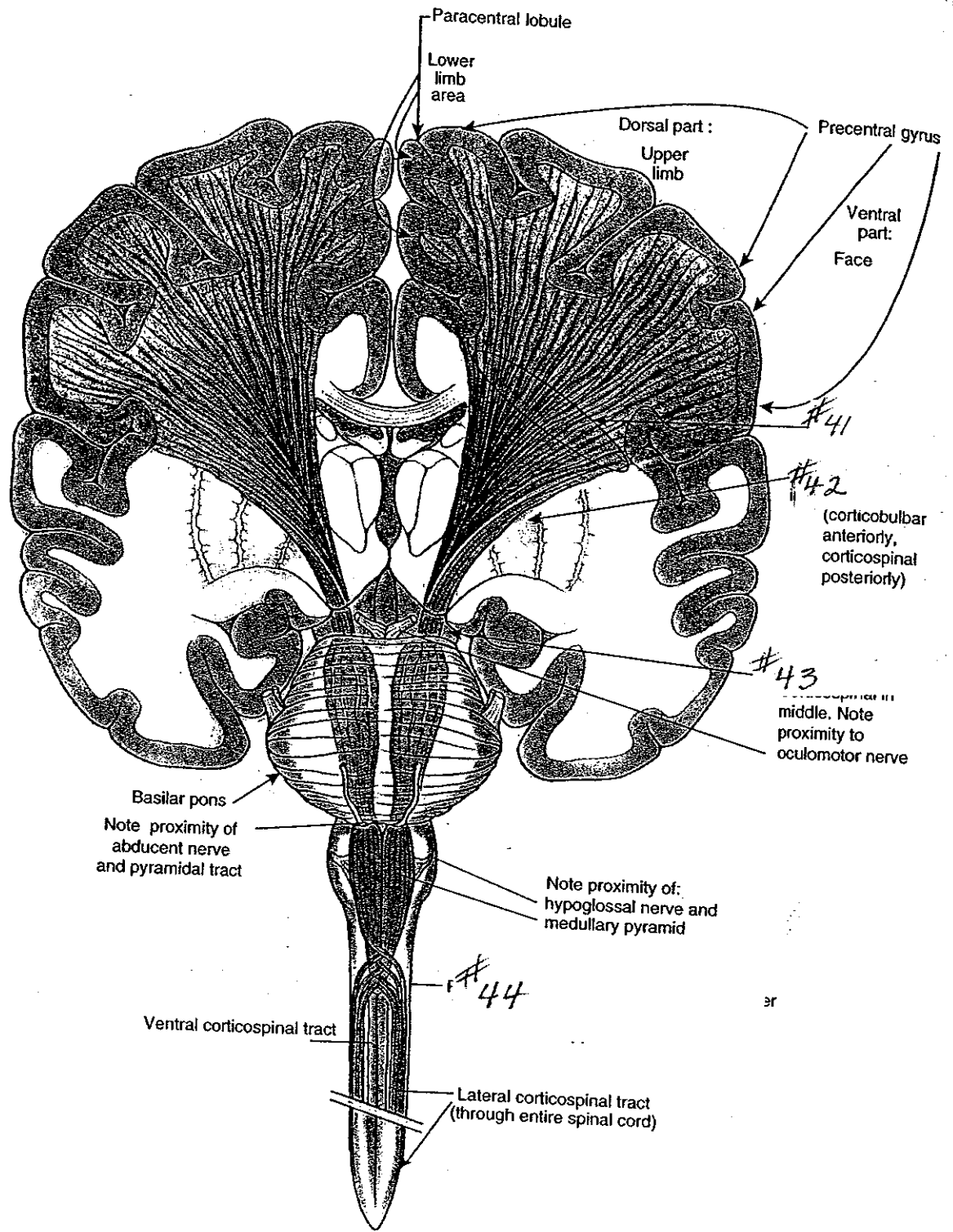


FIGURE 6-1. Three-dimensional anterior view of the pyramidal system, showing its origin, course, and relations.

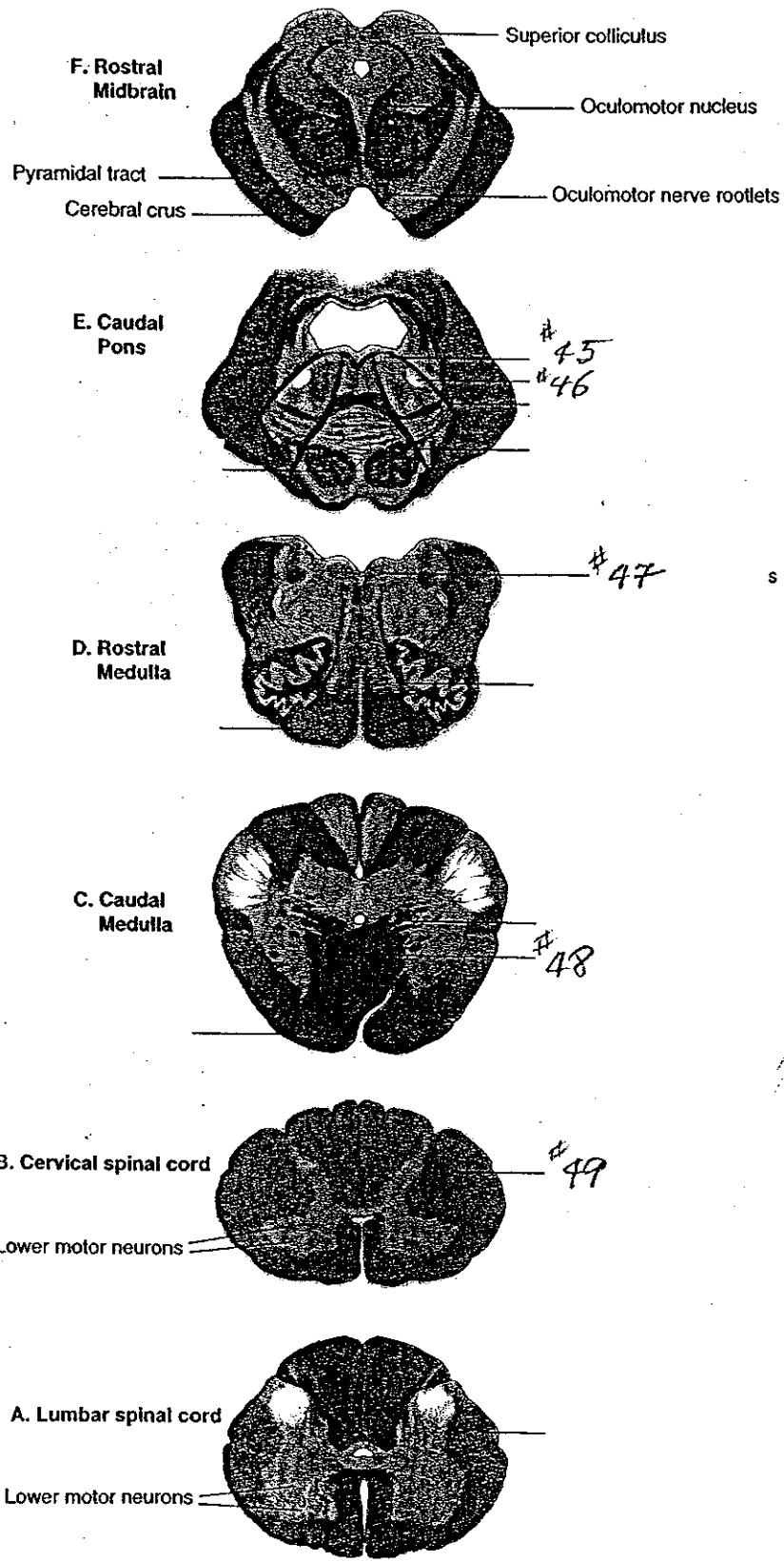
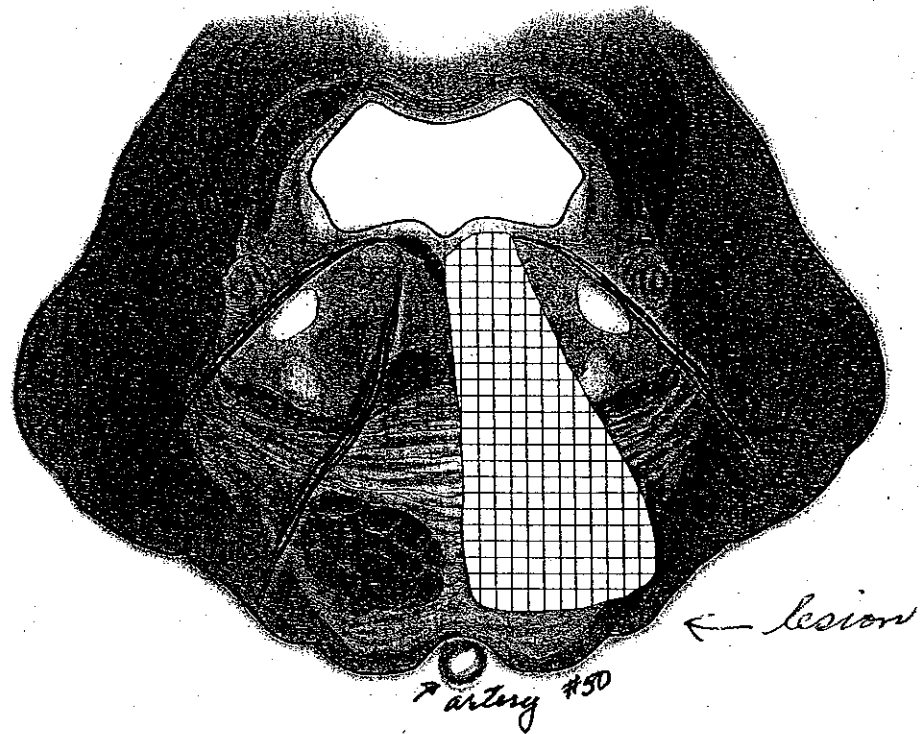


FIGURE 6-3. Location and relations of pyramidal tract in brainstem and spinal cord sections. A. Lumbar spinal cord. B. Cervical spinal cord. C. Caudal medulla. D. Rostral medulla. E. Caudal pons. F. Rostral midbrain.



de and extends

in degenerative
the spinal cord.

2. a. Level: caudal pons

Structures and Abnormalities: Left corticospinal—weakness in the right upper and lower limbs with increased resistance to passive stretch, exaggerated tendon reflexes, and an extensor plantar response

Left medial lemniscus: Loss of two-point, vibration, and limb position senses in the upper and lower limbs, trunk, and neck on the right side

Left trigeminothalamic tract: Loss of pin prick on the right side of the face

Left ascending root of facial nerve: Paralysis of the left facial muscles (upper and lower)

Left abducent nucleus and nerve: Left eye esotropia and paralysis of abduction

Left paramedian pontine reticular formation (PPRF): paralysis of gaze to the left

b. Loss of pain in right eye is due to left trigeminothalamic tract injury. The corneal reflex involves the spinal trigeminal tract and its nucleus as well as interneurons in the reticular formation that carry impulses to the facial nucleus; the trigeminothalamic tract is not involved in the corneal reflex.

c. The right eye turns medially during convergence, which does not involve the horizontal gaze center PPRF. It does not turn medially on attempting to gaze to the left because the damaged left PPRF results in paralysis of gaze to the left.

d. The adductor paralysis of the left eye during gaze to the right is due to a lesion of left medial longitudinal fasciculus (MLF).

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