

## MUSCLES OF THE HEAD AND NECK

### SCALP

The dense connective tissue covering the cranial vault is called the scalp. It is a five layered structure (Fig. 14.8a). The three superficial layers are closely adherent to each other. The layers are:

1. Skin
2. Connective tissue of the superficial fascia
3. Aponeurotic layer of occipitofrontalis muscle
4. Loose areolar tissue (subaponeurotic layer)
5. Pericranium (outer surface of the skull)

The connective tissue of the superficial fascia is dense. It has many cutaneous nerves and vessels. The walls of the vessels are adherent to the thick connective tissue.

The aponeurotic layer is made up of epicranial aponeurosis (galea aponeurotica) in the central part. In the anterior and posterior quadrants of the scalp it presents a pair of **frontalis** and a pair of **occipitalis** muscles respectively. Both these muscles are supplied by **facial nerve**.

The fourth layer of the scalp is made of loose areolar tissue. It is a potential space over which all the three superficial layers move. This space is traversed by emissary veins. These emissary veins connect the veins out side the skull with intracranial veins. These veins are devoid of valves. Hence infection from the scalp may spread into the cranial cavity. This layer of the scalp is called dangerous area of the scalp. Injuries of the scalp can rupture the blood vessels and the blood will accumulate in this area. It can extend up to upper eyelid causing black eye. Blood from the cranial cavity can also spread into this area in accidental injuries involving the fracture of the skull (Fig. 14.8a and b).

#### Nerve Supply

The anterior quadrant is supplied by ophthalmic, maxillary and mandibular divisions of the trigeminal nerve. The posterior quadrant is supplied by cervical spinal nerves ( $C_2$  to  $C_3$ ).

#### Arterial Supply

Scalp is highly vascular and supplied by branches of ophthalmic artery, superficial temporal artery, posterior auricular artery and occipital artery.

### FACE

The muscles of facial expression are subcutaneous muscles. They bring about different facial expressions.

These muscles regulate the three openings situated on the face, namely the palpebral fissure (around eye), the nostrils and the oral fissure (around mouth). Each opening has a sphincter and many dilators (Fig. 14.9a).

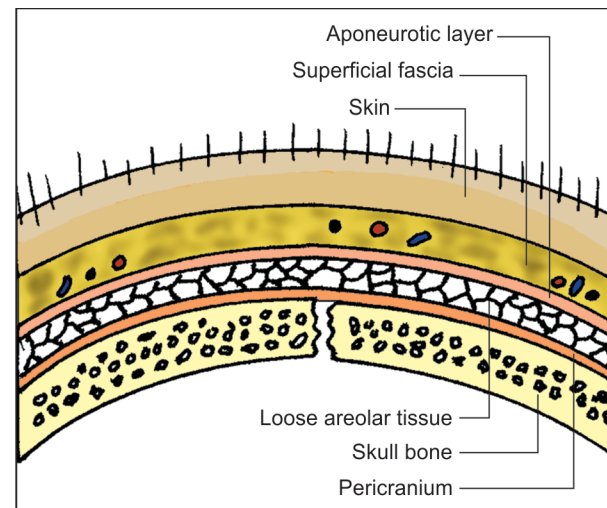


Fig. 14.8a: Layers of the scalp

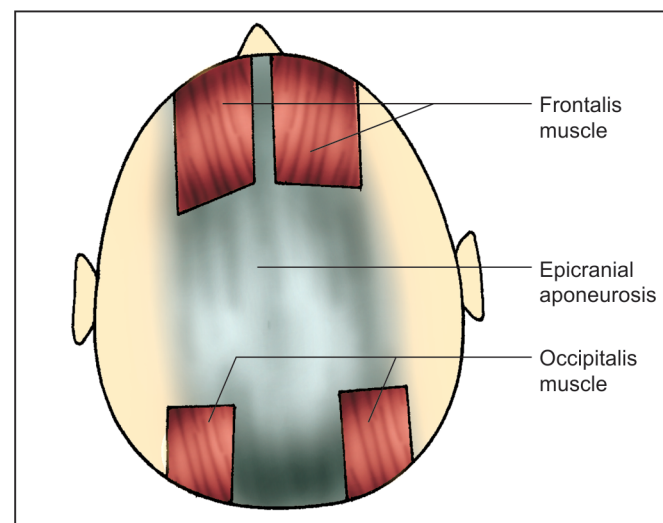
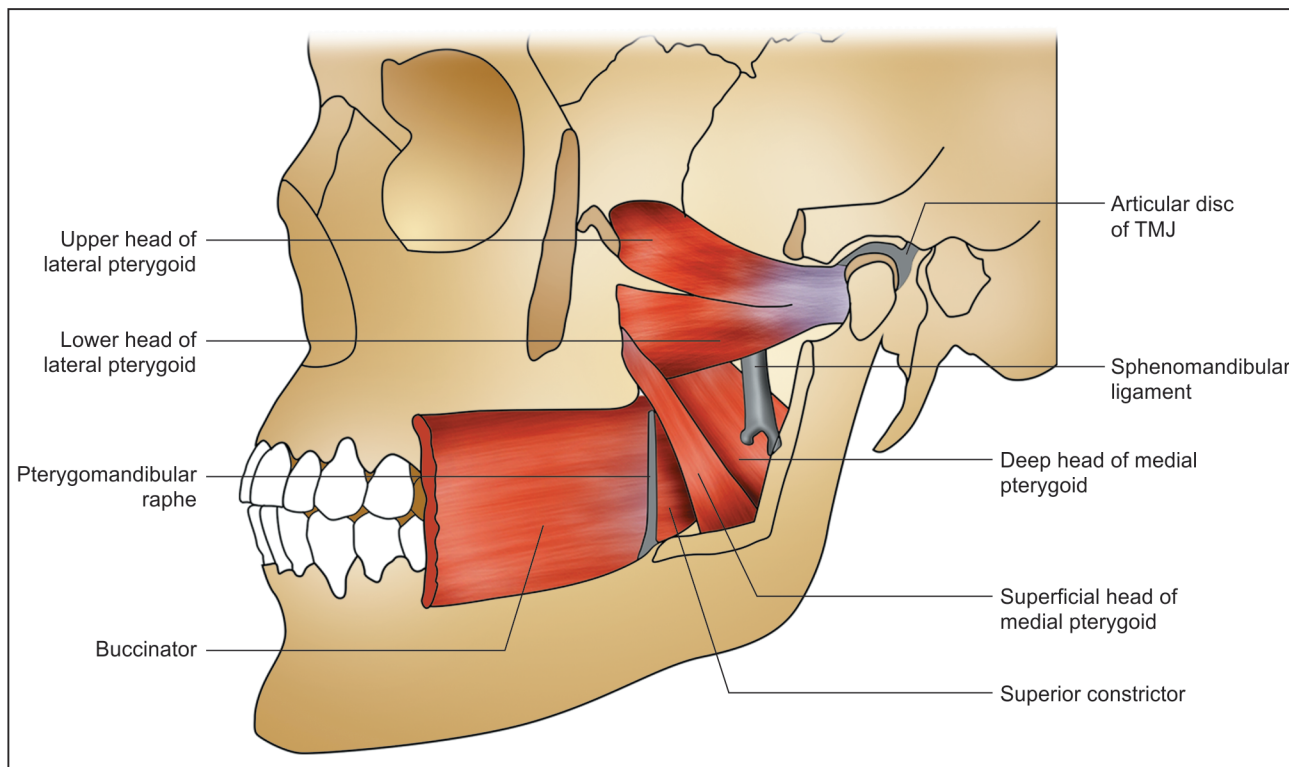


Fig. 14.8b: Superior view showing the muscles

### Muscles

- |                      |  |
|----------------------|--|
| 1. Palpebral fissure | : Orbicularis oculi<br>Levator palpebrae superioris<br>Occipitofrontalis   |
| 2. Oral fissure      | : Orbicularis oris<br>Levator labii superioris<br>alaeque nasi<br>Levator labii superioris<br>Levator anguli oris<br>Zygomaticus minor and major<br>Depressor anguli oris<br>Depressor labii inferioris<br>Mentalis<br>Risorius<br>Buccinator (blowing muscle) |
| 3. Nostrils          | : Compressor naris and dilator naris   |



**Fig. 14.12c:** Lateral pterygoid and medial pterygoid muscles

plate. It is inserted into pterygoid fovea of the mandible and capsule and articular disc of the temporomandibular joint (Fig. 14.12c). It depresses the mandible.

4. **Medial pterygoid:** It has two heads. The superficial head arises from maxillary tuberosity and deep head from medial surface of the lateral pterygoid plate. It elevates the mandible.

#### Prevertebral Muscles

The following muscles lie in front of the cervical vertebral bodies. Main action of these muscles is flexion of head. The muscles are:

1. Longus colli
2. Longus capitis
3. Rectus capitis anterior
4. Rectus capitis posterior
5. Rectus capitis lateralis

#### Soft Palate

It is a muscular fold separating the nasopharynx from the oropharynx. The muscles present in it are explained in Chapter 19.

**Muscles of tongue:** It is explained in Chapter 19.

#### Muscles of the Pharynx

The muscular wall of the pharynx consists of an outer circular (constrictors), and an inner longitudinal layer. They are all explained in Chapter 20.

#### Muscle of the Larynx

It is explained under Chapter 15.

#### Erector Spinae (Sacro-spinalis)

It is an elongated muscle present on the back which extends from the sacrum to the skull. It helps in extension of the vertebral column.

**56. Which of the following statements is incorrect?**

- A. 'Hammer toe' results due to paralysis of lumbricals
- B. 'Flat foot' occurs when medial longitudinal arch drops
- C. In 'talipes equinus' patient walks on the heel with raised forefoot
- D. 'Footdrop' results from damage of common peroneal nerve

**57. Sternoclavicular joint is an example for:**

- A. Saddle variety of synovial joint
- B. Condylar variety of synovial joint
- C. Ellipsoid variety of synovial joint
- D. Hinge variety of synovial joint

**58. Which of these structures is present inside the shoulder joint cavity?**

- A. Coracohumeral ligament
- B. Tendon of the long head of the biceps
- C. Tendon of the long head of the triceps
- D. None of the above

**59. Following muscles contribute to the rotator cuff around shoulder joint, except:**

- A. Supraspinatus      B. Subscapularis
- C. Teres major      D. Infraspinatus

**60. Downward dislocation of humerus at the shoulder joint can damage:**

- A. Radial nerve      B. Axillary nerve
- C. Median nerve      D. Ulnar nerve

**61. Which of these ligaments is involved in 'tennis elbow'?**

- A. Radial collateral ligament
- B. Ulnar collateral ligament
- C. Annular ligament
- D. Quadratus ligament

**62. Which of these bones does not take part in radiocarpal joint?**

- A. Scaphoid      B. Lunate
- C. Triquetrum      D. Ulna

**63. Which of the following statements is incorrect regarding the knee joint?**

- A. Tibial collateral ligament is separated from the medial meniscus by tendon of popliteus
- B. Ligamentum patellae is attached to tibial tuberosity
- C. The fibrous capsule is absent in the anterior aspect
- D. The medial meniscus is semilunar in shape

**64. Which of the following statements is incorrect regarding the cruciate ligaments of the knee joint?**

- A. Posterior cruciate ligament is attached to medial condyle of femur
- B. Anterior cruciate ligament is stretched during extension
- C. Anterior cruciate ligament is more prone for injury
- D. Posterior cruciate ligament prevents the forward displacement of the tibial condyles.

**65. The knee joint is unlocked by:**

- A. Quadriceps femoris
- B. Semimembranosus
- C. Popliteus
- D. Gastrocnemius

**66. The inferior tibiofibular joint is an example for:**

- A. Synovial joint
- B. Primary cartilaginous joint
- C. Secondary cartilaginous joint
- D. Fibrous joint

**67. The upper trunk of the brachial plexus gives:**

- A. Musculocutaneous nerve
- B. Nerve to serratus anterior
- C. Nerve to subclavius
- D. Long thoracic nerve

**68. Which of these nerves is not a branch from the posterior cord of the brachial plexus?**

- A. Dorsal scapular nerve
- B. Subscapular nerve
- C. Thoracodorsal nerve
- D. Axillary nerve

**69. An injury to the C<sub>8</sub> and T<sub>1</sub> nerve roots results in:**

- A. Erb's paralysis
- B. Klumpke's paralysis
- C. Winging of scapula
- D. Wrist drop

**70. Musculocutaneous nerve supplies following muscles:**

- A. Brachialis      B. Biceps brachii
- C. Coracobrachialis      D. All of the above

**71. Which of the following nerves supply only one muscle:**

- A. Nerve to rhomboideus
- B. Lower subscapular nerve
- C. Thoracodorsal nerve
- D. Axillary nerve

5. Give a brief account of the origin, insertion, actions and nerve supply of extraocular muscles.
6. Write briefly about elbow joint.
7. Write briefly about arches of foot. List the major foot deformities.
8. Give an account of the superficial veins of the upper limb. Give their clinical significance.
9. Give an account of the superficial veins of the lower limb. Give their clinical significance.
10. Give an account of the attachments, actions and nerve supply of hamstring muscles.
11. Enumerate the boundaries and contents of the adductor canal.
12. Enumerate the boundaries and contents of the cubital fossa.
13. Write briefly about the articulation, movements and muscles involved in radioulnar joints.
14. Enumerate the boundaries and contents of axilla.
15. Give an account of the layers of the scalp.
16. Give an account of the boundaries and contents of the inguinal canal. Add a note on inguinal hernia.
17. Define a typical intercostal space. Enumerate the contents of the space in brief.
18. Discuss briefly about the ankle joint.
19. Give an account of the attachment, nerve supply and actions of gluteus maximus. List the structures present deep to it.
20. Discuss the different movements of the scapula.
21. Give an account of the origin, root value, course and distribution of femoral nerve.
22. Give an account of the origin, root value, course and distribution of obturator nerve.
23. Name the extraocular muscles of the eye. Give their nerve supply and actions.
24. Give an account of attachment, nerve supply and actions of muscles of mastication.
25. Discuss the temporomandibular joint under—
  - A. Type
  - B. Bones articulating
  - C. Structures stabilising
  - D. Movements and muscles producing them.
3. Discuss the shoulder joint under—
  - A. Bones articulating
  - B. Structures stabilising
  - C. Movements and muscles producing them (1+4+5)
4. Discuss the hip joint under—
  - A. Bones articulating
  - B. Structures stabilizing
  - C. Movements and muscles producing them (1+3+6)
5. Discuss the knee joint under—
  - A. Bones articulating
  - B. Structures stabilising
  - C. Movements and muscles producing them (1+6+3)
6. With the help of a diagram, give an account of the formation and branches of brachial plexus.
7. Give an account of the origin, course, branches and distribution of median nerve. Add a note on its applied aspect. (1+3+5+1)
8. Give an account of the origin, course, branches and distribution of ulnar nerve. Add a note on its applied aspect. (1+3+5+1)
9. Give an account of the origin, course, branches and distribution of radial nerve. Add a note on its applied aspect. (1+3+5+1)
10. Give an account of the origin, course, branches and distribution of sciatic nerve. Add a note on its applied aspect. (1+3+5+1)
11. Give an account of the origin, course, branches and distribution of common peroneal nerve. Add a note on its applied aspect. (1+3+5+1)
12. Give an account of the attachment, major openings, nerve supply and functions of the diaphragm. (5+3+1+1)

### Major Questions (10 marks)

1. Name the bones of the upper limb. Give their specific articulation mentioning the names of the joint. (3+7)
2. Name the bones of the lower limb. Give their specific articulation mentioning the names of the joint. (3+7)

### Answers to Single Best Response Questions

- |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|
| 1. D  | 2. A  | 3. C  | 4. B  | 5. B  | 6. B  |
| 7. C  | 8. D  | 9. A  | 10. B | 11. C | 12. C |
| 13. D | 14. B | 15. C | 16. C | 17. B | 18. D |
| 19. B | 20. A | 21. C | 22. C | 23. C | 24. B |
| 25. D | 26. B | 27. D | 28. B | 29. A | 30. A |
| 31. C | 32. D | 33. B | 34. A | 35. D | 36. D |
| 37. C | 38. B | 39. D | 40. A | 41. B | 42. C |
| 43. C | 44. B | 45. C | 46. D | 47. C | 48. C |
| 49. A | 50. B | 51. C | 52. C | 53. B | 54. C |
| 55. D | 56. C | 57. A | 58. B | 59. C | 60. B |
| 61. A | 62. D | 63. A | 64. D | 65. C | 66. D |
| 67. C | 68. A | 69. B | 70. D | 71. C | 72. A |