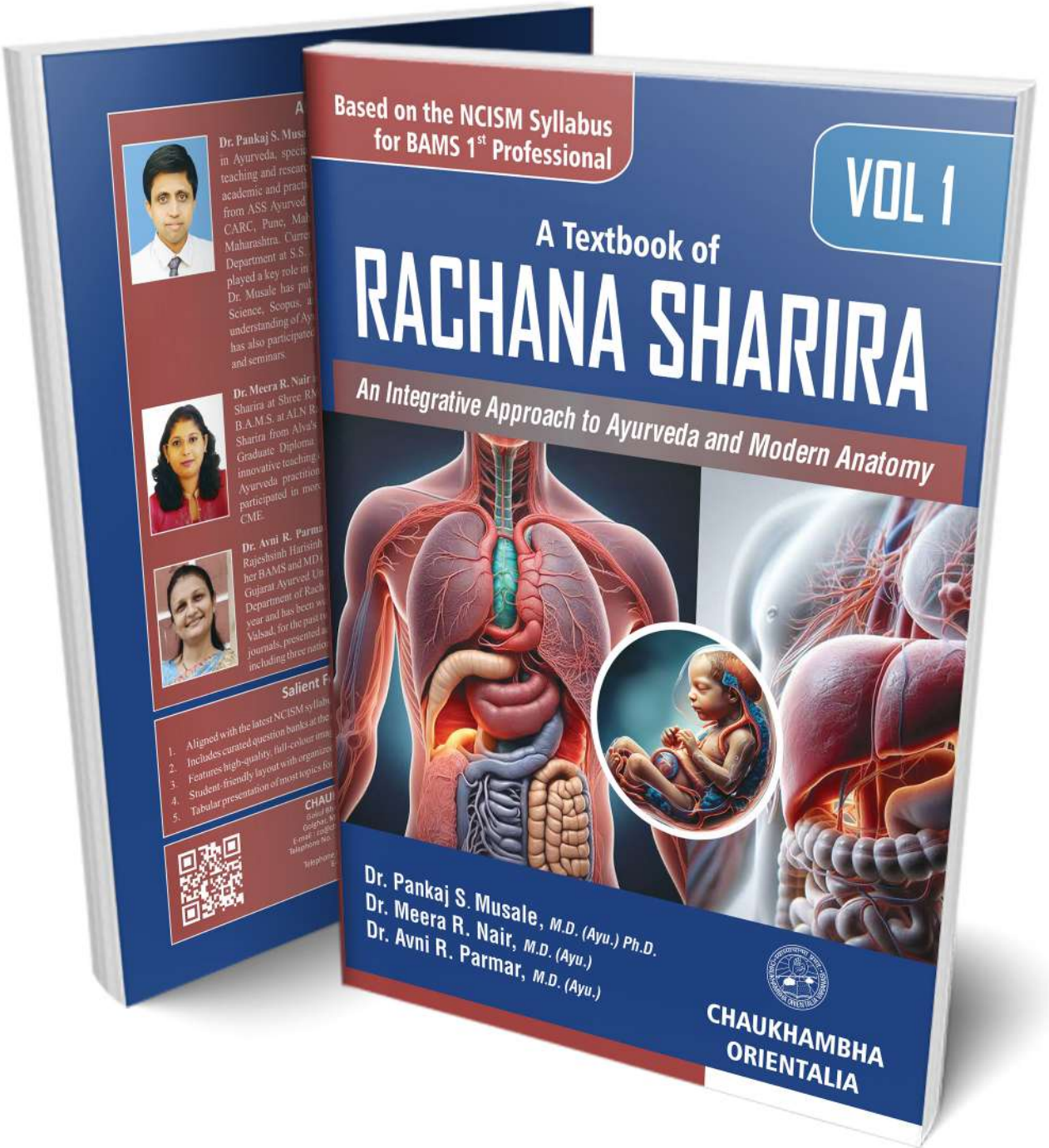
Based on the NCISM Syllabus for BAMS 1st Professional
VOL 1
A Textbook of
RACHANA SHARIRA
An Integrative Approach to Ayurveda and Modern Anatomy
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CHAUKHAMBHA ORIENTALIA

JAIKRISHNADAS AYURVEDA SERIES
481

Textbook of Rachana Sharira

An Integrative Approach to Ayurveda and Modern Anatomy

(Volume 1)

As per the NCISM Syllabus for BAMS 1st Professional

by

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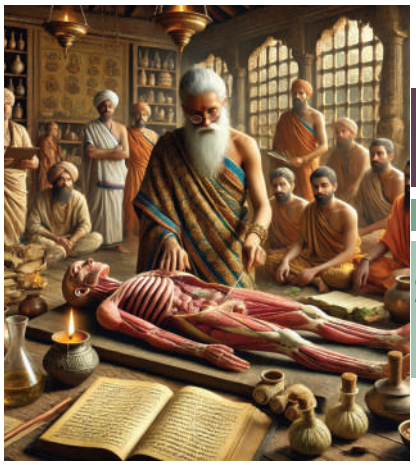


TERM 1 – (VOLUME 1 - PAPER 1)

CHAPTER 1

SHARIROPAKRAMANEEYA SHARIRA

Marks – 6 Questions – MCQ, SAQ

Topics Covered

1.1	Sharira	MK	1.5	Sharira Shastra Vibhag	DK
1.2	Shaarira	MK	1.6	Sharira Gyana Prayojan	MK
1.3	Shadangatvam	MK	1.7	Mruta Sharira Samshodhan	MK
1.4	Anga Pratyanga Vibhaga	MK	1.8	Concept of body donation and its relevance.	NK

This chapter titled shariropakramaniya sharira provide a detailed explanation regarding sharira, its utpatti, paribhasha etc, according to acharya sushruta a vaidya must be well versed with the knowledge of sharira to treat the patient properly.

1.1 SHARIRA

1. Utpatti:

'शृ' धातु + ईश्न् which means to injure/destroy.

2. Vyakhya:

- शीर्यते अनेन इति शरीरम्। (Amar Kosha)

  Sharira is that which gets destroyed constantly.

- शीर्यते प्रतिक्षणम् अपचीयते इति शरीरम्। (Brihat Sharira)

  That which gets degenerated every second is known as sharira.

- शीर्यते हीनस्ति आत्मानम् इति शरीरम्।

  Sharira is that which gets destroyed on its own, that is where there is a continuous process of catabolism going on.

➢ श्रयन्ते त्रयह अग्नयः ज्ञानाग्निः दर्शनाग्निः कोष्ठाग्निः अस्मिन् इति शरीरम्। (Garbhopanishad)

Sharira is the residing place of the three agni i.e. gyaanaagni, darsanaagni and koshtaagni

➢ दिह्यते वर्धते इति देह।

Deha (Sharira) is that which is constantly on the process of growth i.e., where there is a continuous process of anabolism present.

3. Vyakhya according to different acharyas:

(A) According to Nyayadarsana:

➢ आत्मनो भोगायतनं शरीरम्।

Sharira is the medium for athma to utilise or experience all substances.

(B) According to Sushruta acharya :

➢ तं चेतना अवस्थितं वायु विभजति, तेज एनं पचति, आपः क्लेदयन्ति, पृथ्वी संहन्ति, आकाशं विवर्धयति, एवं विवर्धितः स यदा हस्त, पाद जिह्वा घ्राण कर्ण नितम्ब आदिभिः अंगैः उपेतः तदा शरीरम् इति संज्ञा लभते।। (Su. Sa 5/3)

When chetana dhatu/athma enters the garbha, the panchamahabhuta starts to act and vaayu does the division, teja does the digestion, aapa moistens, pruthvi adds compactness and aakasa produces space/cavity for growth. Once the garbha enlarges, there is formation of different body parts like hastha, paada, jihva, ghraana, karna, nitamba etc and after its formation the garbha is known as sharira.

➢ दोष धातु मलं मूलं हि शरीरम्। (Su.Su 15/3)

The combination of tridosha, sapthadhatu and trimala is known as sharira.

➢ अस्मिन् शास्ते पंचमहाभूत शरीरि समवायः पुरुष इति उच्यते।
तस्मिन् क्रिया सो अधिष्ठानम्।। (Su.Su 1/21)

Panchamahabhuta and athma combine to form purusha (synonym of sharira), this purusha is the aashraya for vyaadhi and swaasthya. All the kriya's are performed on this purusha.

(C) According to Charaka acharya :

➢ तत्र शरीरं नाम चेतना अधिष्ठान भूतं पचंमहाभूत विकार समुदायात्मकं संयोगवाहि।। (Cha. Sa. 6/4)

Sharira is the place where chetana and panchamahabhuta resides together in their normalcy.

➢ शुक्र शोणितं जीव संयोगे तु खलु कुक्षिगते गर्भ संज्ञा भवति।। (Cha. Sa. 4/5)

When sukra and shonita along with jivaatma enters the kukshi (uterus), then it's known as garbha.

➢ खादयश्च चेतना षष्ठा धातवः पुरुष स्मृतः। चेतना धातु अपि एकः स्मृतः पुरुष संज्ञकः।। (Cha. Sa. 1/16)

Purusha is made of panchamahabhuta and chetanadhatu and chetana alone can also be considered as purusha.

(D) According to Bhava Prakasha :

➢ गर्भाशयगतं शुक्रं आर्तवं जीवसंज्ञकम् । प्रकृतिः स विकारा च तत् सवर्ं गर्भसंज्ञकम्।।

कालेन वर्धितो गर्भो यद्यड.गोपाङ्ग संयुतः। भवेत् तदा स मुनिभिः शरीरं इति निगद्यते।।

(B.P. Pra - Garbha Prakaran - 63-64)

When sukra and shonita along with jivaatma, ashta prakruti and shodasa vikaara meet inside the garbhaasaya then garbha is formed. Later on, this garbha enlarges/grows and develops anga and then its known as sharia.

1.2 SHAARIRA

1. Vyakhya:

➢ शरीरं अधिकृत्य कृतं तन्त्रं शारीरम्।

The tantra or science that deals with explanation regarding sharia is known as shaarira.

➢ शरीरं चिन्त्यते सर्व दैव मानुष सम्पदा । सर्वभावैः यतः तस्मात् शारीरं स्थानं उच्यते।। (Cha Sa 8/69)

Shaarira sthana is the part where all the daiva, maanusha properties pertaining to sharia is discussed elaborately.

➢ शारीरिक भावं अधिकृत्य कृतो अध्यायः शारीरः। (Dalhana)

The adhyaaya where all the shaaririka bhaava (both rachanatmak like anga, pratyanga and kriyatmak like dosha, dhatu etc) are explained is known as shaarira.

➢ इत्यत्र जन्म मरणं यतः सम्यक् उदाहृतम् । शरीरस्य ततः स्थानं शारीरं इदं उच्यते।। (A.H.Sa 6/73)

Shaarira is where the formation as well as destruction of sharir or its explanation from birth to death is explained elaborately

➢ शरीरं अधिकृत्य कृतो ग्रन्थः शारीरः। (Arunadutta)

Shaarira is the grantha, where all the aspects of sharia are explained

1.3 SHADANGATVAM

For the systemic study of rachana sharira, the body is divided into 6 bhagas :—

(A) According to Sushruta Samhita :

➢ तच्च षड्ङ्गः शाखाः चतस्रो मध्यं पंचम षष्ठं शिर इति। (Su.Sa 5/3)

Shadanga comprises of 4 extremities, 5th one is the madhya bhaaga and 6th one is shiras.

(B) According to Charaka Samhita :

➢ तत्रायं शरीरस्य अङ्गविभागः तद्यथा– द्वौ बाहु, द्वे सक्थिनी शिरोग्रीवम्, अन्तराधिः इति षड्ङंगम्।। (Cha.sa 7/5)

The body constitute of 2 upper limb 2 lower limb, head along with neck and trunk, which make up the shadanga.

(C) According to Astanga Sangraha :

➢ शिरोऽन्तराधि द्वौ बाहु सक्थिनी च।। (A.S.Sa. 5/2)

According to sangraha, sharira is divided into head, trunk, 2 upper limb and 2 lower limb

(D) According to Bhava Prakasha :

➢ आद्यमङ्ग शिरः प्रोक्ता तदुपाङ्गानि कुन्तला .....

-----द्वितीयमङ्ग ग्रीवा तु यथा मूर्द्धा विधार्यते

तृतीयं बाहुयुगलं तदुपाङ्गन्यथ ब्रुवे .....

.....चतुर्थमङ्ग वक्षस्तु तदुपाङ् गन्यथ ब्रुवे .....

.....उदरं पञ्चमञ्चाङ्गं षष्ठं पार्श्वद्वयं मतम्.....

सपृष्ठवंशं पृष्ठं तु समस्तं सप्तमं स्मृतम् (B.P. Pra. 3/66-92)

Aacharya in the above verses has explained regarding the anga and pratyanga, and its formation order. The first anga, to form is shiras, second one to form is greeva, third one is upper limbs, fourth major structure to form is vaksha fifth anga is udara, sixth anga is parshva and seventh one to form is prushta, these are the anga and its order of formation.

1.4 ANGA PRATYANGA VIBHAGA

(1) Definition:

Arunadutta defines pratyangas as organs/structures related to the main 6 angas of sharira. These are structure that are connected to or explained as parts of shadanga.

(2) Classification:

(a) According to Sushruta Samhita :

➢ अतः परं प्रत्यङ्गानि वक्ष्यन्ते – मस्तकोदर पृष्ठ नाभि ललाट नासा चिबुक बस्ति ग्रीवा इत्येता एकैकाः, कर्ण नेत्र भ्रू शंख अंस गण्ड कक्ष स्तन वंक्षण वृषण पार्श्व स्फिक् जानु कूर्पर बाहु उरु प्रभृतयो द्वे द्वे, विंशतिरङ्गुलयः सोतासि वक्ष्यमाणानि, एष प्रत्यंग विभाग उक्तः।। (Su.sa 5/4)

Acharya has explained 66 pratyangas, the following pratyangas are one in number:

मस्तक	Head	नासा	Nose
उदर	Abdomen	चिबुक	Chin
पृष्ठ	Back	बस्ति	Urinary bladder
नाभि	Umbilicus	ग्रीवा	Neck
ललाट	Forehead		

The following pratyangas are 2 in number :

कर्ण	Ear	वंक्षण	Groin
नेत्र	Eyes	वृषण	Testes
शंख	Temporal region	पार्श्व	Flanks
अंस	Shoulder	स्फिक्	Buttocks
गण्ड	Cheeks	जानु	Knee
भ्रू	Eyebrows	कूर्पर	Elbows
कक्ष	Axilla	बाहु	Arms
स्तन	Mammary Region	उरु	Thigh

Along with this acharya has added anguli to pratyangas which are of 20 in number; The acharyas in commentary also opines that the word prabhruthi should be inferred as oshta, srikkani and kukundara.

(B) According to Charaka Samhita :-

➢ षट्पञ्चाशत् प्रत्यंगानि ..... तद्यथा द्वे जङ्घपिण्डिक, द्वे उरुपिण्डिके, द्वौ स्फिचौ, द्वौ वृषणौ, एकं शेफः द्वे उखे द्वौ वंक्षणौ द्वौ कुकुन्दरै एकं बस्ति शीर्षम्, एकमुदरं, द्वौ स्तनौ, द्वौ भुजौ, द्वे बाहुपिण्डिके, चिबुकमेकं, द्वावोष्ठौ, द्वे सृक्कण्यो, द्वौ दन्तवेष्टकौ एकं तालु, एका गलशुण्डिक, द्वे उपजिह्विके, एका गोजिह्विका, द्वौ गण्डौ, द्वे कर्ण शुष्कुलिके, द्वौ कर्णपुत्रकौ, द्वे अक्षिकूटे, चत्वार्यक्षिवर्त्मानि, द्वे अक्षिकनीनिके, द्वे भ्रूवौ, एकाऽवटुः, चत्वारि पाणिपादहृदयानि।। (Cha.Sa.7/11)

According to charaka acharya there are 56 Pratyanga, they are as follows :-

जंघ पिण्डिक	Calves (2)	सृक्कणी	Lip corners (2)
उरु पिण्डिक	Thighs (2)	दन्तवेष्ट	Gums (2)
स्फिक्	Buttocks (2)	तालु	Palate (1)
वृषण	Testicles (2)	गलशुण्डिक	Uvula (1)

शेफ	Penis (2)	उपजिह्विक	Tonsils (2)
उख	Axilla (2)	गोजिह्विक	Tongue (1)
वंक्षण	Scrotum/Groin (2)	गण्डस्थल	Cheeks (2)
कुकुन्दर	Ischial tuberosity (2)	कर्ण शष्कुली	Pinna (2)
बस्ति शीर्ष	Public region (1)	कर्ण पुत्रक	Tragus (2)
उदर	Abdomen (1)	अक्षिकूट	Orbits (2)
स्तन	Mammary Gland (1)	अक्षिवर्त्म	Eyelids (4)
भुज	Arm (2)	अक्षिकनीनिक	Inner canthus (2)
बाहुपिण्डिक	Forearm (2)	भ्रू	Eyebrows (2)
चिबुक	Chin (1)	अवटु	Back of neck (1)
ओष्ठ	Lips (2)	पाणिपादहृदय	Palmar & Plantar Region (4)

1.5 SHARIRA SHASTRA VIBHAGA

The sharira,its anga and pratyangas are explained in sharira shastra. For the easy understanding and studying of these anga and pratyangas based on its anatomical structures and physiological function, it can be divided into 2 parts as (a) Rachana Sharira (b) Kriya Sharira

(a) Rachana Sharira :

➢ रचना प्रतिपादकं शारीरं रचनाशारीरम्।

The division of sharira which describes about the structure of the body is known as rachana sharira this mainly includes the study of avayava, aashaya, peshi, asthi, sandhi, sira, dhamani etc including its types, number, relation etc.

In the ayurvedic classics details regarding the sharira are explained in sharira sthana, and among these, sharira sthana of susruta samhita is said to be sreshta .

Following are chapters of sharira sthana in different samhitas :-

(i) Susruta Samhita : 10 chapters.

S.N.	Name of Chapters	Content
1	सर्वभूतचिंता शारीरं	Explained about Srishti utpatti
2	शुक्र शोणित शुद्धि शरीरं	Explained about Suddha sukra and shonita and formation of jeeva & garbha

3	गर्भवक्रान्ति शारीरं	Explained about development of fetues
4	गर्भ व्याकरण शारीरं	Explained about kalaa, organ formation, nourishment of garbha
5	शरीर संख्या व्याकारण शारीरं	Details about anga pratyanagaformation and about asthi, sandi, peshi etc
6	प्रत्येक मर्म निर्देश शारीरं	Explained about marma
7	सिरा वर्ण विभक्ति शारीरं	Explained in detail about siras of body
8	सिरा व्यध विधि शारीरं	Explained about sira vyadha vidhi, avedhya siras and raktha mokshana
9	धमानि व्याकरण शारीरं	Explained about dhamani & srotas
10	गर्भिणि व्याकरण शारीरं	Explained about garbhini, sootika, sootika paricharya, baala vikara, sthanya suddhi etc

(ii) Charaka Samhita : 8 Chapters

1	कतिधा पुरुषीय शारीर	5	पुरुष विचय शारीर
2	अतुल्य शोत्रीय शारीर	6	शरीर विचय शारीर
3	खुड्डिका गर्भावक्रान्ति शारीर	7	शरीर संख्या शारीर
4	महती गर्भावक्रान्ति शारीर	8	जाति सूत्रीय शारीर

(iii) Ashtanga Hrudaya : 6 Chapters

1	गर्भ वक्रान्ति शारीर	4	मर्म विभाग शारीर
2	गर्भ व्यापद् शारीर	5	विकृति विज्ञानीय शारीर
3	अंग विभाग शारीर	6	दूतादि विज्ञानीय शारीर

(iv) Abhinava Shaariram: 8 Chapters

1	अभिनिवृत्ति शारीरम्	5	मर्म शरीरम्
2	विचय शारीरम्	6	प्रमाण शारीरम्
3	अंग विनिश्चय शारीरम्	7	दोष धातु मल शारीरम्
4	व्याकरण शारीरम्	8	विकृति विज्ञानीय शारीरम्

(b) Kriya Sharira :

➢ **क्रिया प्रतिपादकं शारीर क्रिया शारीरम्।**

This division of shaarira that deals with the functional aspects of dosha, dhatu, mala and other body structures.

(d) Cryogenics : The body is cooled at-196 degree Celsius using liquid nitrogen in tanks.

1.8 CONCEPT OF BODY DONATION AND ITS RELEVANCE

A good foundation in human anatomy is integral to the training of medical students. Body donation plays a critical role in helping medical and health related science students to master the complex anatomy of human body and provide researchers with an essential tool for discoveries to help patients.

Voluntary body donation is a program where in the general population can will their bodies to serve the purpose of medical education and scientific research. Body donation is governed by the 'Anatomy Act 1949', an "Act to provide for the supply of unclaimed bodies of diseased person or donated bodies to hospitals and medical teaching institution for the purpose of anatomical examination, dissection and other similar purposes".

Whole body donation can only be made to hospitals that have been authorised by the state government, to accept such donations like a teaching hospital where it will be used solely for the purpose of research or training for the students.

Denial of Donation :

The body will not be accepted if;

- The potential donor has an infectious or contagious disease.
- The next of kin objects to the donation of the body.
- The body has been autopsied or mutilated or is decomposed.
- The potential donor is under the age of 18 years.

Question Bank - Shariropakramaneeya Sharira

MCQs

1. The tantra that deals with the explanation of body is:

   A) Sharira B) Pratyanga
   C) Shadanga D) Shaarira

2. The Shadanga comprises of Shakha, Madhyabhaga and _____

   a) Greeva c) Shiras
   b) Antharaadhi d) Udara

3. According to Bhavaprakash the sharira is divided into how many parts.
   a) 7 c) 6
   b) 8 d) 5
4. As per charaka Acharya how many pratyangas are there:
   a) 56 c) 54
   b) 52 d) 58
5. As per charaka Acharya sharir is _
   a) Samyogvahi c) Both A & B
   b) Vishamyogvahi d) None of the above
6. Number of chapters in shaarira sthana of Susrutha Samhita:
   a) 9 c) 10
   b) 8 d) 7
7. The adhisthana of chetana along with the panchmahabhuta and vikaras is known as sharira according to which Acharya:
   a) Charak c) Vagbhata
   b) Sushruta d) Shadangdhara
8. As per charaka Acharya the sharira is combination of
   a) Chetana + Panchmahabhuta +Vikara
   b) Chetana + Panchmahabhuta + Tridosha
   c) Chetana + Panchmahabhuta + Saptadhatu
   d) Atama + Tridosha + Saptadhatu
9. Number of chapters in shaarira sthana of charaka Samhita:
   a) 9 c) 10
   b) 8 d) 7
10. As per sushruta Acharya the garbha is combination of__
    a) Sukra + Shonita + Atama + Panchmahabhuta + Vikara
    b) Sukra + Shonita + Atama + Saptadhatu + Vikara
    c) Sukra + Shonita + Atama + Tridosha + Vikara
    d) None of This
11. The मृतशोधनएवंसंरक्षण of dead body process is divided into how many stages.
    a) 2 c) 3
    b) 4 d) 5

12. The laststage of preservation and dissection of the dead body as per sushruta Acharya.
    a) Selection Criteria of The Body
    b) Preservation Procedure of The Body
    c) Dissection Procedure of The Body
    d) None of This
13. For the appropriate decomposition, the dead body is keptin slow flowing riverfor how many days:
    a) 7 c) 8
    b) 5 d) 6
14. The method of preservation of the body submerged in honey is known as:
    a) Mummification c) Plastination
    b) Mellification d) Embalming
15. The method of preservation of the body by cooling it at -196 degree Celsius using liquid nitrogen is known as:
    a) Mummification c) Plastination
    b) Mellification d) Cryogenics

Answer Key														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
d	c	b	a	a	c	b	a	b	d	c	c	a	b	d

SAQs

1. Explain sharira according to different acharyas.
2. Explain Angapratyanga vibhaga according to Sushruta samhita.
3. Explain pratyanga according to different acharyas
4. Explain sharia shastra vibhagin detail.
5. Write short note on susrutoktha sharira sthana
6. Write the importance of sharira gyana
7. Explain about mruta sharira samshodhana.

❑❑❑

CHAPTER 2

TERM 1 – (VOLUME 1 - PAPER 1)

PARIBHASHA SHARIRA

Marks – 4 Questions – MCQ & SAQ

Topics Covered

For all topics - Explain term (MK); Evaluate Clinical Importance (DK)

2.1	Kurcha	2.5	Seemanta
2.2	Kandara	2.6	Seevani
2.3	Jala	2.7	Rajju
2.4	Asthisamghata	2.8	Lasika

2.1 KURCHA

2.1 (a) Nirukti:

- कूर्चाइवकूर्चानाम्नैवाकृतिरून्नेयाः। (Su. Sa. 5/13)

Kurcha are brushes like structures.

- कूर्चा कृतयः स्नाय्वादिविशेषः। Indu (A.S. Sa. 5/56)

Kurcha are the structures which resemble the kurcha or brush. It is made up of snayu etc structures.

2.1 (b) Svarupa / Structure:

- ते पुनर्मांसास्थिसिरास्नायुनांजालकप्रभवाणांसन्ततिविरचिताः। Dalhana (Su. Sa. 5/56)

Kurcha are formed from the network of sira, snayu, mamsa, asthi. Jala formed out of sira, snayu, mamsa, asthi.

- कूर्चाअपिसिरास्नायुमांसास्थिप्रभवाः स्मृतः। (B.P. Pu. 3/274)

Kurcha are formed by sira, snayu, mamsa, asthi.

- कूर्चानामस्नायुधमनीसन्निपातः। Haranchandra (Su. Sa. 5/13)

Kurcha are formed out of network of the snayu and dhamani.

2.1 (c) Number:

➢ **षट्कूर्चाः।** (Su. Sa. 5/13)

Kurcha are 6 in number.

➢ **षट्कूर्चाः।** (A.H. Sa. 3/14)

Kurcha are 6 in number.

➢ **कूर्चाद्विचत्वारिंशत्।** (K.S. Sa. 1/2)

Kurcha are 42 in number.

2.1 (d) Distribution:

➢ **ते हस्तपादग्रीवामेढ्रेषु, हस्तयोर्द्वौ, पादयोर्द्वौ ग्रीवामेढ्रयोः एकैका।** (Su. Sa. 5/13)

The kurcha are distributed

Hasta - 02, Pada - 02, Griva - 01, Medhra - 01

2.1 (e) Correlation:

- **Hastagata kurcha**
  - ♦ Palmar aponeurosis
  - ♦ Long tendons of hand with lumbricals
  - ♦ Superficial palmar arch
  - ♦ Median and ulnar nerve
  - ♦ Bones of hand
- **Padagata kurcha**
  - ♦ Plantar aponeurosis
  - ♦ Long tendons of foot
  - ♦ Branches of dorsalis pedis artery
  - ♦ Medial and lateral plantar nerve
  - ♦ Bones of foot
- **Grivagata kurcha -** Ligamentum nuchae
- **Medhragata kurcha -** Ligament of penis & clitoris.

2.1 (f) Clinical relevance:

➢ **मृदुना वा दन्तधावनकूर्च केनापहरेत् प्रणुदेद्वाऽन्तः।** (Su. Su. 27/19)

Kurcha is mrudu brush like structure, which is useful for removing shalya stuck in kantha pradesha.

➢ **सन्धिकूर्चकभ्रूस्तनान्तरतलकर्णेषु स्वस्तिकम्।** (Su. Su. 18/18)

Kurcha word is mentioned in the context of sandhi bandhana.

CHAPTER 3

GARBHA SHARIRA

Marks – 15 Questions – MCQ, SAQ, LAQ

Topics Covered

3.1	Garbha Definition	MK
3.2	Sukra Definition	MK
3.3	Artava Definition	MK
3.4	Role of Tridosha and Panchamahabhuta in fetal development.	MK
3.5	Concept of Beeja, Beejabhag, Beejabhagavayava	MK
3.6	Masanumasik garbha Vruddhikram	MK
3.7	Garbha Poshana	MK
3.8	Apara Nirman	MK
3.9	Garbha Nabhinadi	MK
3.10	Angapratyanga Utpatti according to different Acharya.	MK
3.11	Garbha Vikruti.	MK

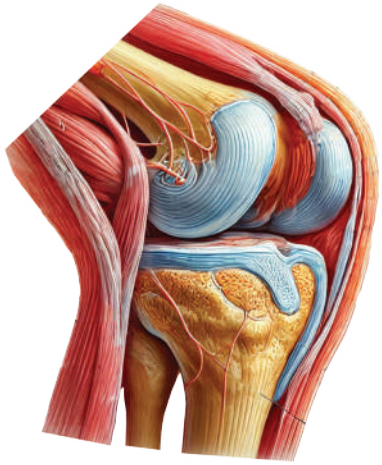
Garbha shaarira chapter gives detailed explanation regarding garbha, its formation and development; also, the factors contributing to the growth of fetus. Acharya has explained about the factors in khuddika garbhavakranti and garbhavakranti shaarira in charaka and sushruta samhitas, that are necessary to obtain a healthy progeny.

3.1 GARBHA DEFINITION

(A) Utpatti:

➢ गृ + अर्त्तिगृभ्यां भन्।

The word garbha is derived from the root "Ghri" (गृ) which means to consume



CHAPTER 5

SANDHI SHARIRA

Marks – 04 Questions – MCQ, LAQ, SAQ

Topics Covered

5.1	Define the term Sandhi	MK
5.2	Enumerate the Sandhi	MK
5.3	Classify Sandhi into different types with its clinical importance	MK
5.4	Applied aspects of sandhi and introduction to diseases of sandhi in Ayurveda	DK

5.1 DEFINE THE TERM SANDHI

The term sandhi is derived from the root words sam + dha+ ki and this means to come together or junction or joint.

➢ अस्थि संयोगस्थानम्।

It is defined as a place where asthi joins.

➢ अस्न्थां तु सन्धयो ह्येते केवलाः परिकीर्तिताः।

पेशी स्नायुसिराणां तु सन्धि संङ्ख्या न विद्यते।। (Su.Sa. 5/28)

The term sandhi is usually used to denote asthi sandhi, but other types of places where two structures like muscles, snayu or sira meet can also be called as sandhi.

➢ सन्धिसंश्लेषाच्छ्लेषकः सन्धिषु स्थितः। (A.H.Su. 12/18)

According to vagbhata acharya sleshma is present in the joints and sleshaka kapha is present in joints which aid in smooth movement and lubrication of joints.

CHAPTER

6

SNAYU SHARIRA

Marks – 03 Questions – MCQ, SAQ

Topics Covered

6.1 DEFINITION- VYUTPATTI, NIRUKTI, UTPATTI

6.1 (a) Vyutpatti:

➢ स्नाति ष्णा शौचे। (Amarkosha)

The word snayu derived from "Sna dhatu" which means to clean.

6.1 (b) Nirukti:

➢ अंग प्रत्यंग सन्धिबन्धनरुपाया स्नायोः। (Amarkosha)

Snayu are binding structure (which binds different body parts).

➢ वायु वाहिनांङ्गायाम्। (Vaidhak Shubda Sindhu)

Snayu referred to channels which carry vayu (vayu vahinam).

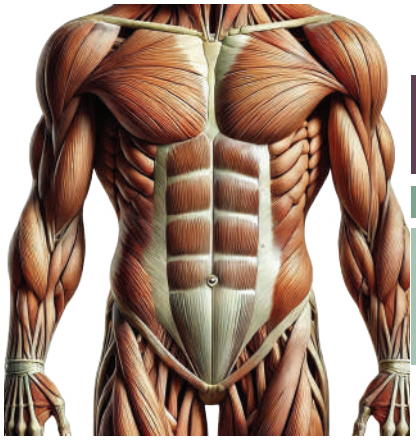
➢ स्नायु इति शणाकार विशेषः येन धनूंषि नहयन्ते। Dalhana (Su.Su. 25/21)

Snayu has structural resemblance with shana which is prepared using hemp fiber.

➢ मांसवहे द्वे, तयोर्मूलं स्नायुत्वचं रक्तवहाश्च धमन्यः। (Su. Sa. 9/12)

Snayu is one among the moola of mamsavaha strotas.

According to Monier William's dictionary the meaning of the word snayu is any snew, ligament, tendon, muscle nerve or vein.



CHAPTER

7

PESHI SHARIRA

Marks – 03 Questions – MCQ, SAQ

Topics Covered

7.1 NIRUKTI

➢ **पेश्यः पुनः स्नाय्वाकृतयो मांसमय।** Indu (A.S.Sa. 5/71)

Peshi are the structure which appears like snayu made up of mamsa dhatu.

➢ **मांसावयय संघातः परस्पर विभक्तः पेशीत्युच्यते।** Dalhana (Su.Sa. 5/38)

The peshi are specialized structures which are made up of union of mamsa (mamsa avayava samghata) but these are separated from each other.

➢ **पेशी दीर्घाकृति मांसखण्डः।** Deepikatika (Sh. Pu. 5/4)

Peshi is an elongated piece of mamsa.

7.2 UTPUTTI

➢ **यथार्थ मूष्मणा युक्तो वायुः स्त्रोतांसि दारयेत् । अनुप्रविश्य पिशितं पेशीर्विभजते तथा।।** (Su.Sa. 5/29)

When usma yukta vayu entering into pishit (mamsa) divides into peshi.

7.3 TYPES

➢ **तासां बहल पेलव स्थूल अणु पृथु वृत्त हस्व दीर्घ स्थिर मृदु श्लक्ष्ण कर्कश भावाः सन्त्यस्थ सिरा स्नायु प्रच्छाद-काःयथा प्रदेशं स्वभावतः एव भवन्ति।** (Su.Sa. 5/40)

Based on structures Peshi are of following type:

CHAPTER
8

KESHA, DANTA, NAKHA SHARIRA

Marks – 04 Questions – MCQ, SAQ

Topics Covered

8.1	Description of Panchbhautika swaroopa and its applied value	MK
8.2	Explaination of its swabhava (pitruja) and its applied value	MK
8.3	Description of prakrita (normal) and vikruta (abnormal) swaroopa (appearance) of kesha, danta, nakha is concern with disease.	MK
8.4.	Importance of examination of kesha, danta, nakha.	MK

8.1 DESCRIPTION OF PANCHBHAUTIKA SWAROOPA AND ITS APPLIED VALUE

➢ तत्र यद्विशेषतः स्थूलं स्थिरं मूर्तिमद् गुरुखरकठिनमङ्ग नखास्थिदन्त मांसचर्मवर्चः केशश्मश्रुलोम कण्डरादि तत् पार्थिवं गन्धो घ्राणं च ----- (Cha.Sa. 7/16)

Kesha, danta and nakha have prithvi mahabhuta dominancy.

By knowing panchbhautika swaroopa of kesha, danta and nakha one can use dravya (medicine) in treatment of disease person.

8.2 EXPLAINATION OF ITS SWABHAVA

➢ यानि खल्वस्य गर्भस्य पितृजानि----तद्यथा केशश्मश्रुनखलोमदन्तास्थि सिरास्नायुधमन्यः शुक्रं चेति। (Cha.Sa. 3/7)

Kesha, danta and nakha are considered as pitruja bhava (pitruja avayava).

8.3 DESCRIPTION OF PRAKRITA (NORMAL) AND VIKRUTA (ABNORMAL) SWAROOPA

(A) Prakrita /Normal Swaroopa:

(a) Kesha:

Prakrita Kesha:

➢ सुस्निग्धा मृदवः सूक्ष्मा नैकमूलाः स्थिरा कचाः। (Cha.Sa. 3/107)

CHAPTER 9

TERM 1 – (VOLUME 1 - PAPER 1)

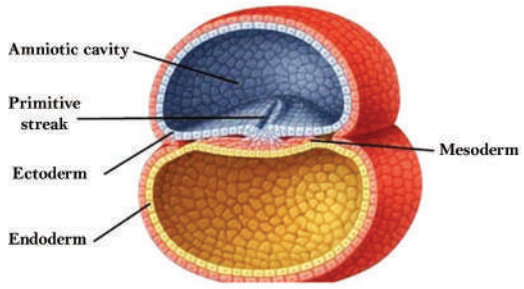
EMBRYOLOGY

Marks – 05 Questions – MCQ, SAQ, LAQ

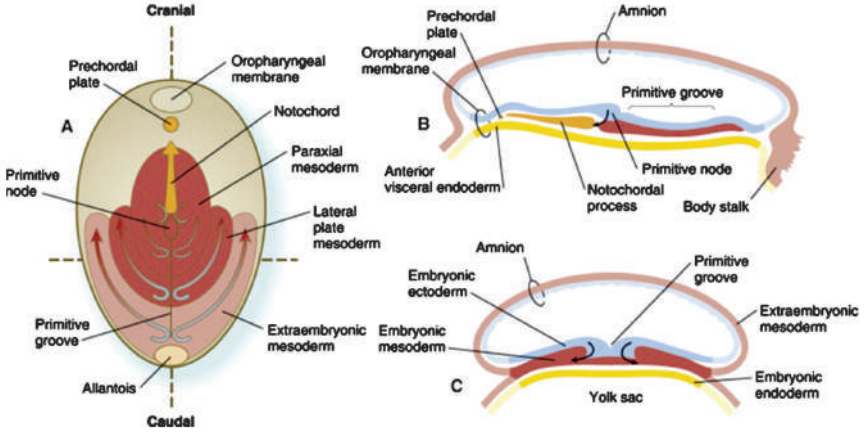
Topics Covered

9.1	Define Embryology and Enlist its Branches	DK
9.2	Define Embryo and Foetus	MK
9.3	Describe Anatomical Structure of sperm and ovum and Explain its Clinical Importance.	MK
9.4	Define the term Fertilization	MK
9.5	Process of cleavage	MK
9.6	Explain germ layer formation process and its derivatives.	MK
9.7	Explain Laws of Heredity.	MK
9.8	Sex determination and differentiation	NK
9.9	Month wise development of foetus.	MK
9.10	Explain foetal circulation and the changes in circulation after birth	MK
9.11	Describe placenta formation and its structure with applied anatomy	MK
9.12	Describe umbilical cord and its clinical importance	MK

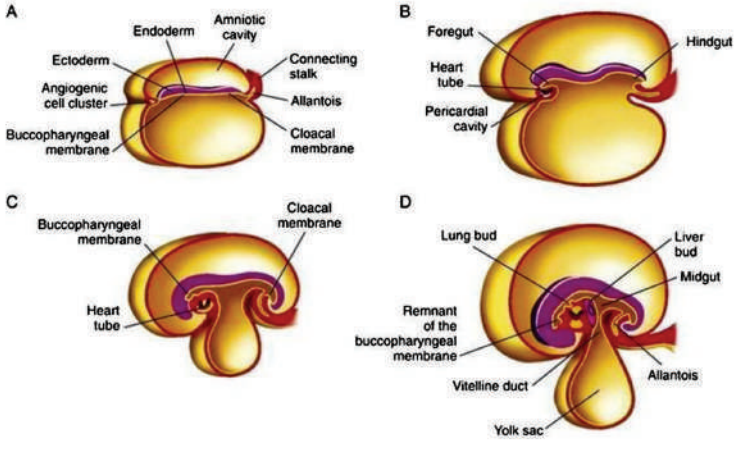
In this chapter embryology, we will learn how an organism develop from single celled zygote to a multicellular organism. Understanding of this subject is crucial for comprehending the origins and structures of living organism and play a major part in field such as medicine, genetics and evolutionary biology.



9.11 (c) Primitive streak



9.11 (d) Mesoderm



9.11 (e) Connecting stalk & cloacal membrane

Fig. 9.11 Prochordal plate, Primitive streak, mesoderm connecting stalk, cloacal membrane and Yolk sac

After the implantation of the embryo, the uterine endometrium is called as Decidua. After implantation the features of endometrium seen during the secretory phase of menstrual cycle is intensified. The stromal cells enlarge, become vacuolated, stores lipids and glycogen, this change is known as decidual reaction.

The deciduae are divided into 3 parts namely Decidua Basalis, Decidua Capsularis and Decidua Parietalis. The portion of the deciduae where the placenta is to be formed is called the decidua basalis. The part of the decidua that separates the embryo from the uterine lumen is called the decidua capsularis, the part lining the remaining part of uterine cavity is called the decidua parietalis.

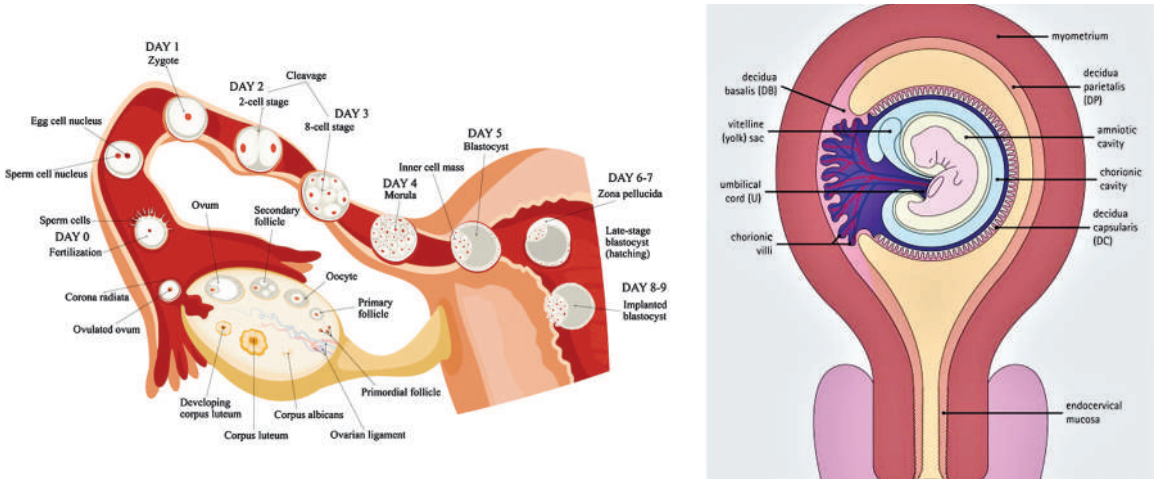


Fig. 9.13 (a) & (b) implantation and deciduae

Villis are the finger like process which forms the structural and functional unit of placenta. These are surrounded by maternal blood and these villi contain capillaries through which fetal blood circulates.

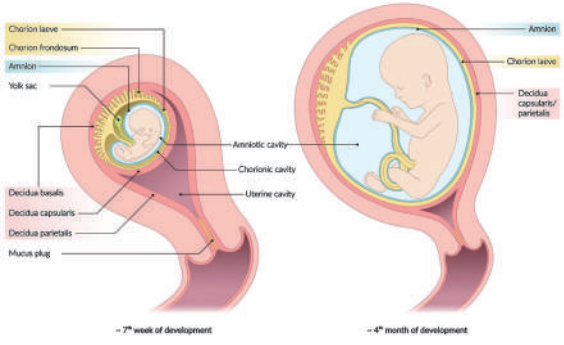


Fig. 9.14 Chorion formation

The chorion consists of trophoblast and extra embryonic mesoderm and the villi arising from it is called as the chorionic villi. These villi are first formed all over the trophoblast layer and grow into the surrounding decidua.

The villi related to decidua capsularis degenerate and this part of the chorion becomes smooth and is called chorion laevae. The villi that grown into decidua basalis undergo development and form a disc shaped mass called the placenta The part of chorion that form placenta is called the chorion frondosum

(viii) The villi that are first formed are attached on the fetal side to the embryonic mesoderm and on the maternal side to the cytotrophoblastic shell hence they are called as Anchoring villi.

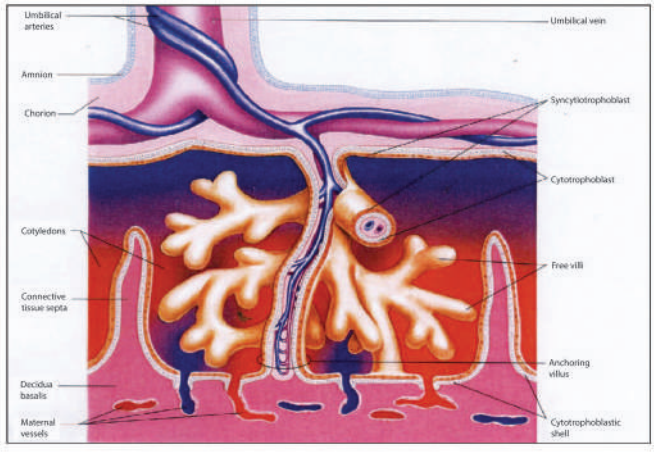
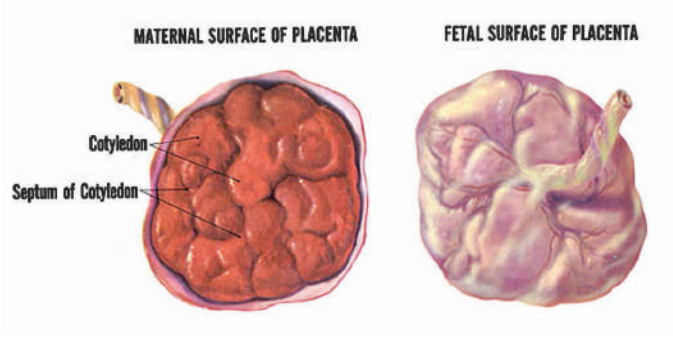


Fig. 9.22 Villi structure

Each anchoring villus consists of a stem known as truncus chorii which branches to form rami chorii which divides further into finer branches called as ramuli chorii



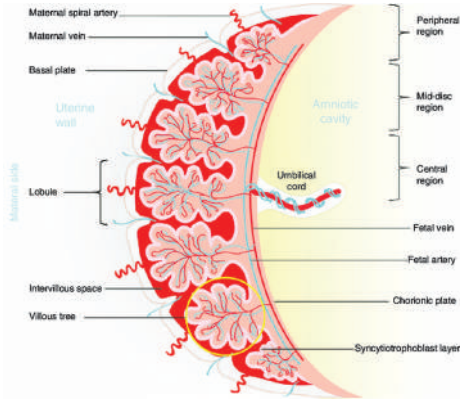


Fig. 9.23 Placenta

(ix) The placenta now gets subdivided into a number of lobes, by septa that grows into the intervillousspace, each lobe of placenta is known as maternal cotyledons. There are about 15-20 lobes and 60-100 fetal cotyledons (anchoring villus and its branches) and weight about 500 gm.

CHAPTER 10

OSTEOLOGY

Marks – 12 Questions – MCQ, SAQ, LAQ

Topics Covered

10.1 Bone: Structure, types and ossification

10.2 Description of each bone with clinical anatomy

10.1 A) BONE STRUCTURE MK

Macroscopic Structure of Bone

Compact Bone (Dense bone)

- Hard and dense
- Resembles an ivory
- Contain no marrow space

Cancellous Bone (Spongy bone)

- Consist of sponge work of trabeculae arranged in regular pattern, adapted to resist local stress and strain.
- Contain marrow cavity, which is filled with red /yellow marrow.
- Both bone are formed of tiny plates of mineral matter known as **lamellae**.

Microscopic Structure:

- Space in spongy bone are large.
- In compact bone tissue is dense and contains narrow channels.

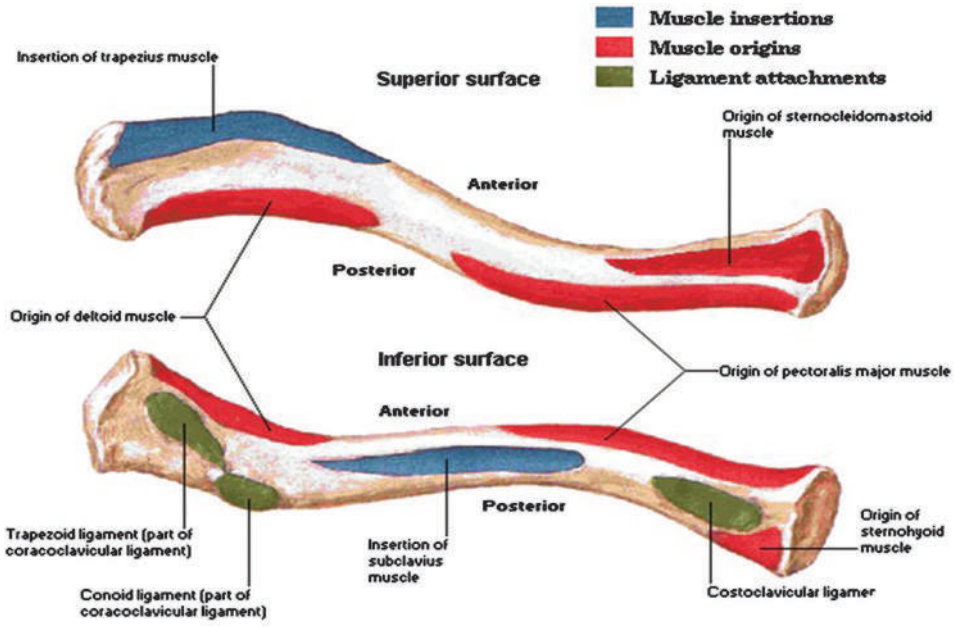


Figure 10.2 Muscle attachment of clavicle

Sex dittermination:

Table no. 10.2: Sex dittermination of Clavicle

Male	Female
- Acromial end is on a level with or slightly higher than sternal end. - Clavicle is longer, thicker, more curveds, rough. - Muscular impressions are more marked.	- Acromial end is slightly below the level the of sternal end. - Clavicle is shorter, thinner less curveds, smooth. - Muscular impressions are less marked.

Applied / Clinical anatomy:

- Common site of fracture: Junction of lateral 1/3rd and medial 2/3rd.
- Congenitally absent of clavicle or imperfectly developed clavicle known as cleidocranial dysostosis.

2) Scapula:

Introduction:

- It is large, triangular bone.
- Lying on posterolateral aspect of chest wall.
- Opposite to 2nd to 7th rib.

Number- 2

Type: Flat bone

Side determination:

- Glenoid cavity should face forwards, laterally and slightly upwards;
- Dorsal surface bearing spine should face backwards.
- Coracoid process should point forwards and slightly laterally
- Inferior angle should face downwards

Features:

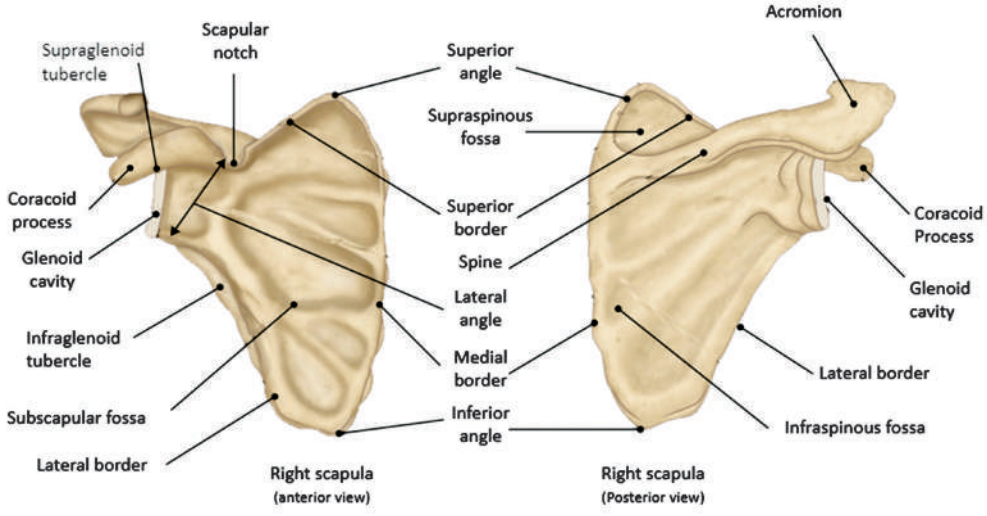


Figure 10.3 Scapula

2 surfaces, 3 borders, 3 angles, 3 processes

2 Surfaces:

Table no. 10.3: Surfaces of Scapula

Costal / Subscapular fossa	Dorsal
Concave, Directed medially & forward, 3 longitudinal ridge	Spine of scapula: smaller supraspinous fossa, larger infraspinous fossa. Both fossa connected by spinoglenoid notch, situated lateral to the root of spine.

7) Foot

Anteroposterior view

- Calcaneum
- Cuboid
- Cuneiform
- Navicular
- Talus
- Metatarsal
- Phalanges

Fig. 10.40 X-ray foot AP view

Lateral view of ankle and foot

- Calcaneum
- Calcaneum
- Cuboid
- Cuneiforms
- Navicular
- Talus
- Lower end of Tibia
- Lower end of Fibula
- Metatarsals

Fig. 10.41 X-ray foot Lateral view

8) Thorax:

Posteroanterior view

- Ribs
- Scapula

Left lateral view

- Sternum
- Thoracic vertebra

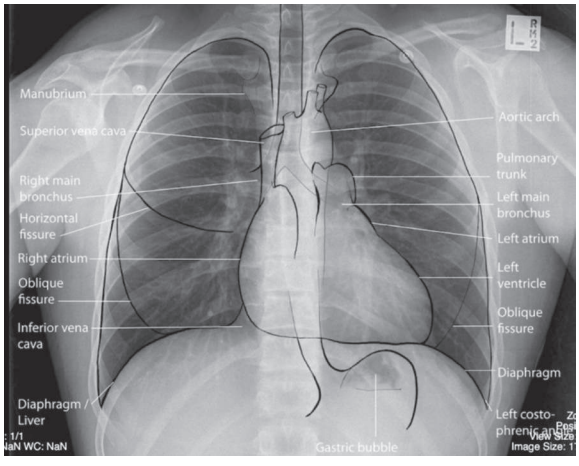
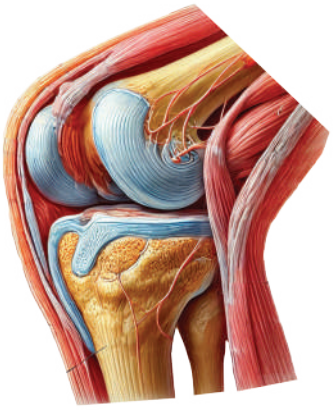


Fig. 10.42 X-ray thorax PA view

CHAPTER 11

TERM 2 – (VOLUME 1 - PAPER 1)

ARTHROLOGY



Marks – 10

Questions – MCQ, SAQ, LAQ

Topics Covered

11.1 JOINTS: STRUCTURE, TYPES AND MOVEMENTS

11.1 a) Structure:

Introduction:

Joints means a place where two or more things are joined together in general term. Joint is a junction between two or more bones or cartilages in anatomical term. The term articulation means a joint in latin. The term arthrology means study of joints.

11.1 b) Classification / types of Joints:

Joints can be classified according to their structure and function.

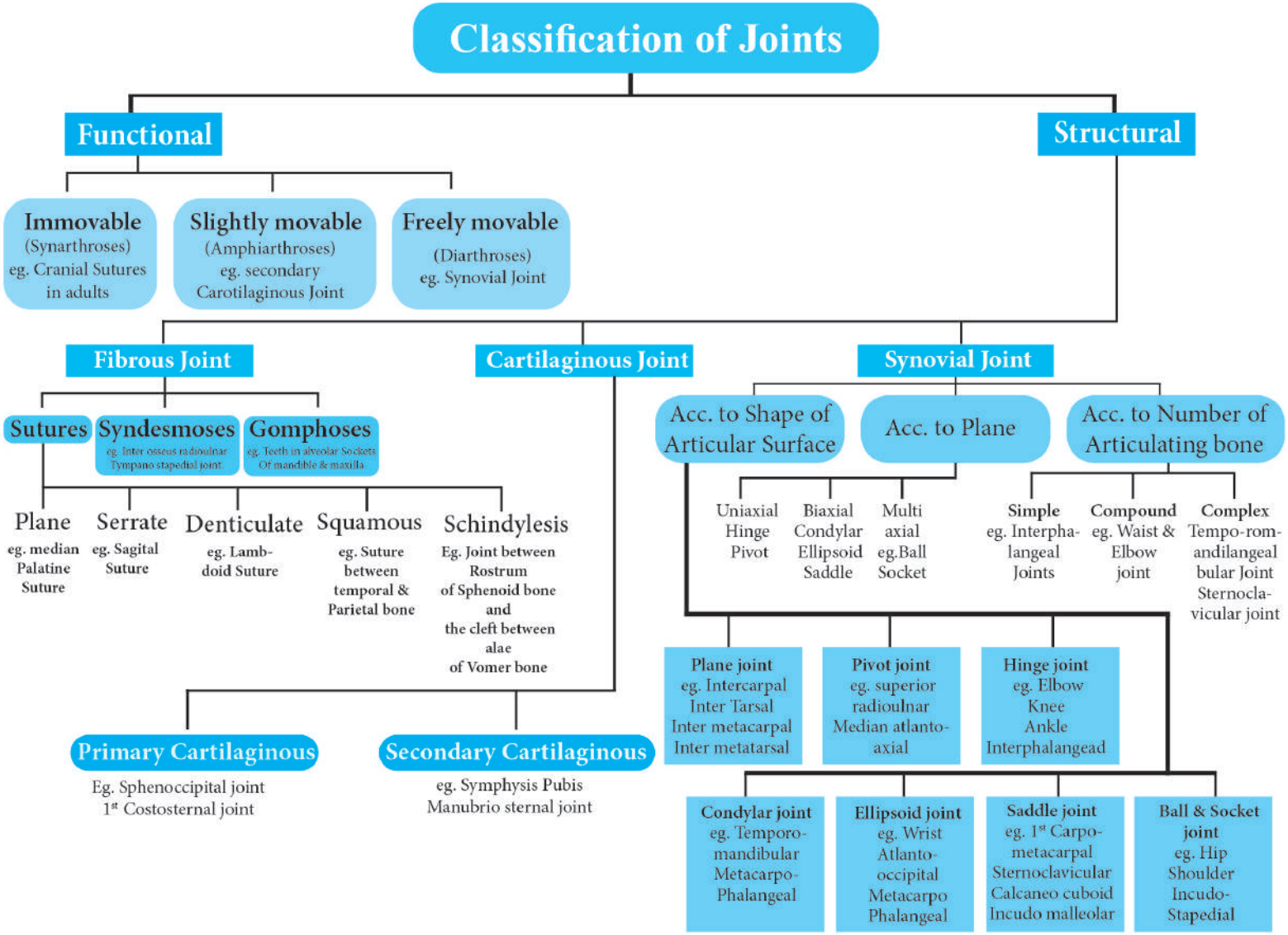
I. Functional classification: It is based upon degree of mobility of joints

3 types

i) Immovable joints (Synarthroses)
ii) Slightly movable joints (Amphiarthroses)
iii) Freely movable joints (Diarthroses)

i) Immovable joints:

- Shows no mobility.
- Fixed joint.


Classification of Joints
Functional
Structural
Immovable
(Synarthroses)
eg. Cranial Sutures
in adults
Slightly movable
(Amphiarthroses)
eg. secondary
Carotilaginous Joint
Freely movable
(Diarthroses)
eg. Synovial Joint
Fibrous Joint
Cartilaginous Joint
Synovial Joint
Sutures
Syndesmoses
eg. Inter osseus radioulnar
Tympano stapedial joint
Gomphoses
eg. Teeth in alveolar Sockets
Of mandible & maxilla
Plane
eg. median
Palatine
Suture
Serrate
eg. Sagital
Suture
Denticulate
eg. Lamb-
doid Suture
Squamous
eg. Suture
between
temporal &
Parietal bone
Schindylesis
Eg. Joint between
Rostrum
of Sphenoid bone
and
the cleft between
alae
of Vomer bone
Primary Cartilaginous
Eg. Sphenoccipital joint
1st Costosternal joint
Secondary Cartilaginous
eg. Symphysis Pubis
Manubrio sternal joint
Acc. to Shape of
Articular Surface
Acc. to Plane
Acc. to Number of
Articulating bone
Uniaxial
Hinge
Pivot
Biaxial
Condylar
Ellipsoid
Saddle
Multi
axial
eg.Ball
Socket
Simple
eg. Interpha-
langeal
Joints
Compound
eg. Waist &
Elbow
joint
Complex
Tempo-rom-
andilangeal
bular Joint
Sternocla-
vicular joint
Plane joint
eg. Intercarpal
Inter Tarsal
Inter metacarpal
Inter metatarsal
Pivot joint
eg. superior
radioulnar
Median atlanto-
axial
Hinge joint
eg. Elbow
Knee
Ankle
Interphalangead
Condylar joint
eg. Temporo-
mandibular
Metacarpo-
Phalangeal
Ellipsoid joint
eg. Wrist
Atlanto-
occipital
Metacarpo
Phalangeal
Saddle joint
eg. 1st Carpo-
metacarpal
Sternoclavicular
Calcaneo cuboid
Incudo malleolar
Ball & Socket
joint
eg. Hip
Shoulder
Incudo-
Stapedial

- No movement.
  Eg. Cranial sutures in adults, Primary cartilaginous joint in growing children.

ii) Slightly movable joints

- Shows some degree of mobility.
- A pad of cartilage lies between the bone surface.
- Slight movement is possible.
  Eg. Secondary cartilaginous joint, syndesmoses

iii) Freely movable joint:

- Show maximum degree of mobility.

Eg. Synovial joint

II. Structural classification: It is based upon type of connecting tissue and the presence or absence of a joint cavity.

3 types

i) Fibrous joint
ii) Cartilaginous joint
iii) Synovial joint

i) Fibrous joint:

- The bones forming the joint are united by fibrous connective tissue.
- These joints are either immovable or permit slight degree of movements.
- A fibrous joints lacks joint cavity.

3 Sub types:

A) Sutures
B) Syndesmosis
C) Gomphosis

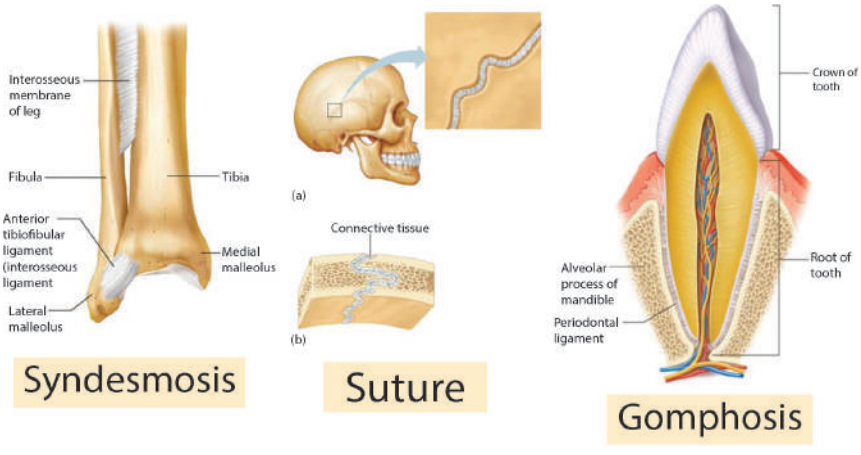


Fig. 11.1 Sub type of fibrous joint

- ◆ Injury to menisci.
- ◆ Injury to cruciate ligament.
- ◆ Injury to collateral ligament.

- Malalignment of patella: Patellar position may be altered congenitally or due to tightness of surrounding structures.
- Semimembranous bursitis is common
- Baker's cyst: Central swelling occurs due to osteoarthritis of knee joint.
- Knee joint replacement.
- Atrophy of vastus medialis.

3) Ankle joint:

❖ **Type:** Hinge variety of synovial joint.

❖ **Articular surface:**

- Upper articular surface formed by:

- ◆ Lower end of tibia including medial malleolus.
- ◆ Lateral malleolus of fibula.
- ◆ Inferior transverse tibiofibular ligament.

- Inferior articular surface formed by:

- ◆ Articular areas on the upper, medial and lateral aspects of the talus.

❖ **Stability of joint:**

- Close interlocking of the articular surfaces.
- Strong collateral ligaments on the sides.
- Tendons that cross the joint, four in front, three on posteromedial side and two on posterolateral side.

❖ **Ligaments:** 3

i) Fibrous capsule:

- It is weak anteriorly and posteriorly.
- Posterosuperiorly: It is attached to the inferior transverse tibio fibular ligament.
- Anteroinferiorly: It is attached to the dorsum of the neck of the talus at some distance from trochlear surface.

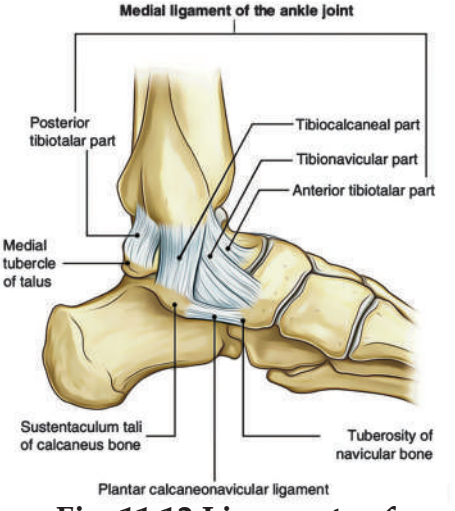


Fig. 11.12 Ligaments of ankle joint

ii) Deltoid /Medial ligament:

- It is very strong triangular ligament present on the medial side of the ankle.

CHAPTER 12

TERM 2 – (VOLUME 1 - PAPER 1)

MYOLOGY

Marks – 04 Questions – MCQ, SAQ

Topics Covered

12.1 Structure and types of muscles. Description of important muscles: Origin, insertion, actions, nerve supply and clinical anatomy. MK

12.2 Muscle movements in yogasana DK

12.1 STRUCTURE AND TYPES OF MUSCLES
DESCRIPTION OF IMPORTANT MUSCLES: ORIGIN, INSERTION, ACTIONS, NERVE SUPPLY AND CLINICAL ANATOMY

12.1 A) State the types of muscles: Mk

Depending on morphological and functional characteristics there are 3 types of muscles.

1) Skeletal muscles
2) Smooth muscles
3) Cardiac muscles

Table no. 12.1: Characteristic features of muscles

Characteristic feature	Skeletal muscle	Smooth muscle	Cardiac muscle
Location	Usually attached to the skeleton	Present in the wall of viscera	Present in wall of heart
Synonym	Somatic, Voluntary, Striated	Involuntary, Non-striated, Smooth	Myocardium

3. Brachialis	Anterior surface of lower half of shaft of humerus and related intermuscular septa	Rough anterior surface of coronoid process of ulna and ulnar tuberosity	Musculocutaneous & Radial nerve.	Flexion of forearm at elbow joint.

❖ **Applied aspect:**

- Testing biceps brachii against resistance: Flex the elbow against resistance, you can see and palpate the hardening of the biceps brachii muscle.
- Biceps reflex: Tap tendon of biceps with the elbow pronated and partially extended. The flexion of elbow joint is the normal reflex, which is used to test the musculocutaneous nerve.
- Brachial pulsation are felt or auscultated in front of elbow just medial to tendon of biceps for recording the blood pressure.

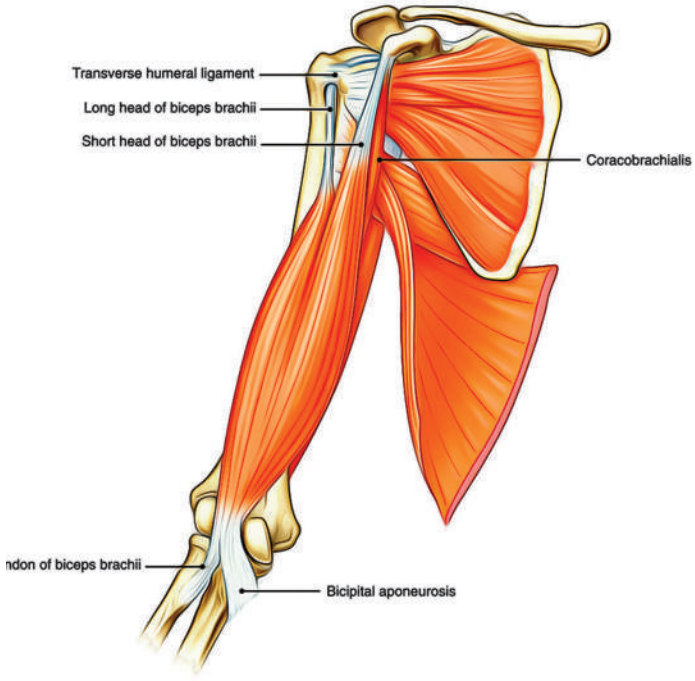


Fig. 12.1 Muscles of anterior compartment of arm

Muscle of posterior compartment of Arm:

1) Triceps brachii:

Origin: Long head: Infraglenoid tubercle of scapula.

Lateral head: Oblique ridge on upper part of posterior surface of shaft of humerus.

Medial head: Large triangular area on the posterior surface of shaft of humerus.

Insertion: Posterior part of superior surface of olecranon process.

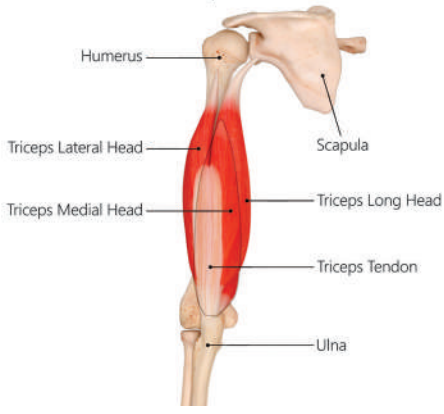


Fig. 12.2 Muscle of posterior compartment of arm

5. Flexor cari ulnaris	Humeral head: Medial epicondyle of humerus. Ulnar head: Medial aspect of olecranon process and posterior border of ulna	Pisiform bone, Hook of hamate, Base of 5th metacarpal bone	Ulnar nerve	Flexion and adduction of hand at wrist joint.

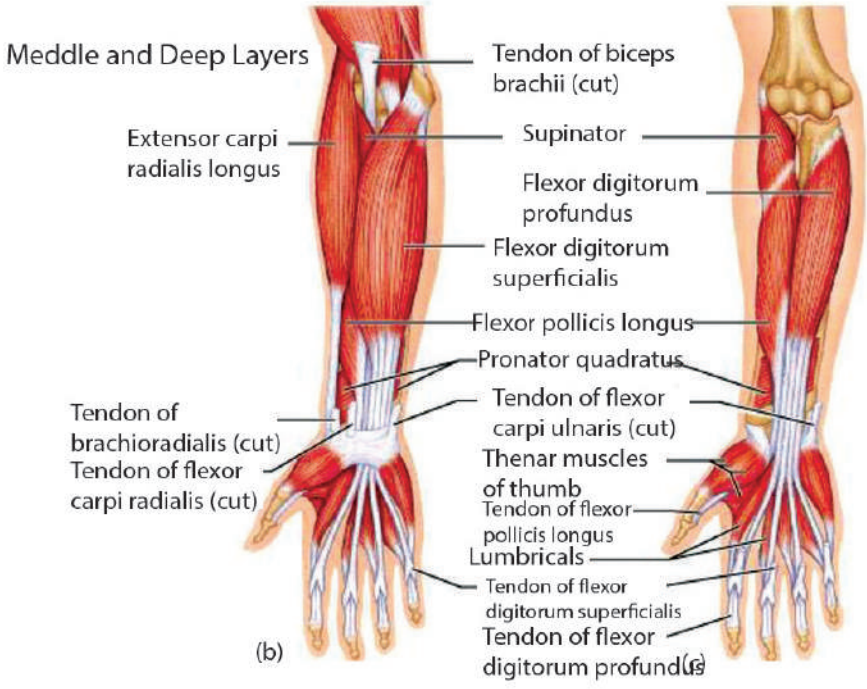


Fig. 12.3 Muscles of anterior compartment of forearm (Superficial and deep)

Clinical / Applied aspect:

- Ulnar nerve injury at elbow causes paralysis of flexor carpi ulnaris muscle.
- Ulnar nerve lesion at wrist causes ulnar claw hand.
- Paralysis of pronator teres kept forearm in supine position.
- Paralysis of flexor carpi radialis hand is abducted.

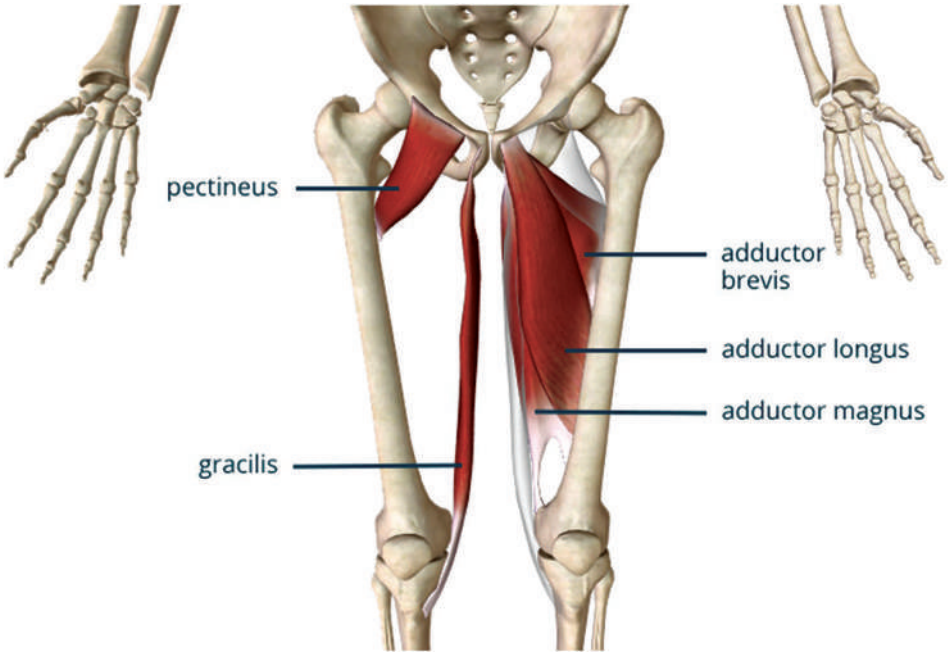


Fig. 12.7 Muscles of medial compartment of thigh

Clinical / Applied aspect:

- The surgical division of obturator nerve relieved spastic paraplegia caused by spasm of adductor muscles of the thigh.
- Referred pain in knee due to common nerve supply by obturator nerve.

Table no. 12.10: Muscles of back of thigh / posterior compartment of thigh

Muscle	Origin	Insertion	Nerve supply	Action
1. Semitendinosus	Inferomedial impression on upper part of ischial tuberosity	Upper part of medial surface of tibia	Tibial part of sciatic nerve	Flexion of knee and medial rotator of leg, Weak extension of hip.
2. Semimembranosus	Superolateral impression on upper part of ischial tuberosity	Groove on posterior surface of medial condyle of tibia	Tibial part of sciatic nerve	Flexion of knee and medial rotator of leg, Weak extension of hip.

TEXTBOOK OF RACHANA SHARIRA
(AN INTEGRATIVE APPROACH TO AYURVEDA AND MODERN ANATOMY)
TERM 2 – (VOLUME 1 - PAPER 1)

CHAPTER

NERVOUS SYSTEM

13

Marks – 14

Questions – MCQ, SAQ, LAQ

Topics Covered

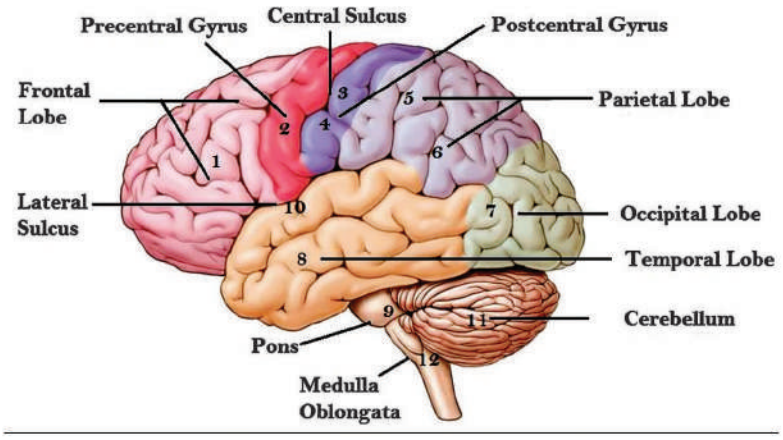


Fig. 13.6: Functional areas of cerebral cortex

White matter of Cerebrum:

The white matter forms the central core of each cerebral hemisphere. It consists of multitudes of nerve fibres connecting various parts of cortex with each other & with other parts of CNS.

Grouping of Fibres: 3 groups

1] **Association fibres:** They connect one cortical area with another of the same hemisphere. So they are ipsilateral.

2] **Commissural fibres:** They connect the cortices of 2 hemispheres. It crosses the midline.

3] **Projection fibres:** They connect the cerebral cortex with subcortical regions of CNS in both directions.

Corpus Callosum:

It is the largest commissure of brain. It connects the 2 cerebral hemispheres.

Length: 10 cm **Breadth:** 2.5 cm

It joins the frontal, parietal & occipital lobes.

It forms the roof of lateral and third ventricle.

It is arched with concavity downwards antero-posteriorly and concave upwards from side to side.

Parts: **1)** Genu **2)** Rostrum **3)** Trunk **4)** Splenium

1] **Genu:** It is the anterior end. It lies 4 cm behind the frontal pole. It is related anteriorly to the anterior cerebral arteries & posteriorly to the anterior horn of lateral ventricle.

Length:

Adult Male – 45cm

Adult Female – 42cm

Weight: 30gm

Relations:

Superiorly it is continuous with medulla oblongata

Inferiorly it terminates as conus medullaries.

Enlargements:

Cervical Enlargement – for supply of upper limb muscles and it extends from C4 to T1 with max diameter at C6 – 38mm.

Lumbar Enlargement – for supply of muscles of lower limb and it extends from level of L2 to S3 segments with max diameter at S1 -35mm.

Functions:

1. It acts as conduit for motor information, which travels down the spinal cord.
2. It serves as a conduit for sensory information in the reverse direction.
3. It is centre for coordinating simple reflexes.

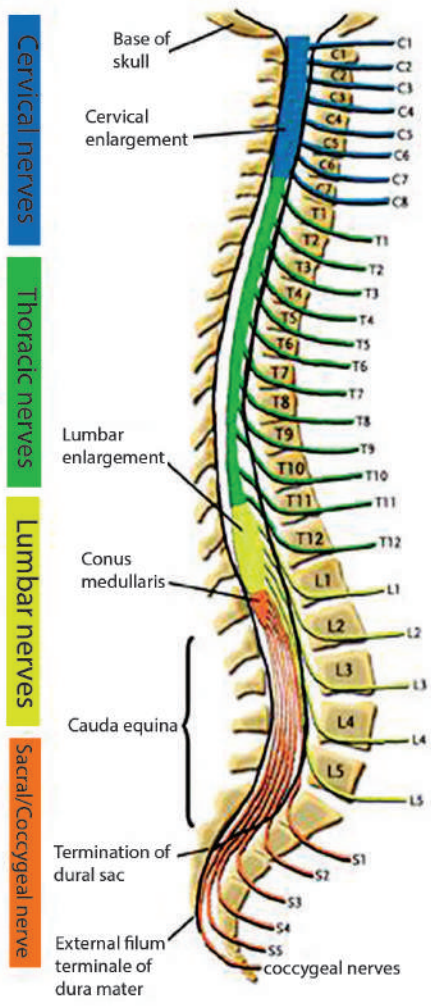


Fig. 13.10 Spinal Cord

Cauda Equina:

Dorsal & ventral nerve roots of right and left sides of L2 to L5, S1 to S5 and C1 nerves lie almost vertically around filum terminale. These are called cauda equina.

External Features:

- Anteriorly, the spinal cord shows deep anterior median fissure which lodges the anterior spinal artery.
- Posterior median sulcus is a thin longitudinal groove from which a septum runs in the depth of spinal cord.
- Each half is subdivided into anterior, lateral and posterior regions by antero-lateral and posterolateral sulci.

Clinical Anatomy:

1] Argyll Robertson Pupil: This is condition when light reflex is lost but accommodation reflex remains intact. It occurs because lession in pretectal nucleus.

Causes: Tertiary syphilis
Diabetes
Encephalitis

2] Lession of tegmentum may involve

a) Third nerve leading paralysis of extraocular muscles.

b) Sensory tracts: resulting in loss of sensation

c) Substantia nigra & subthalamic nucleus leading to involuntary movements.

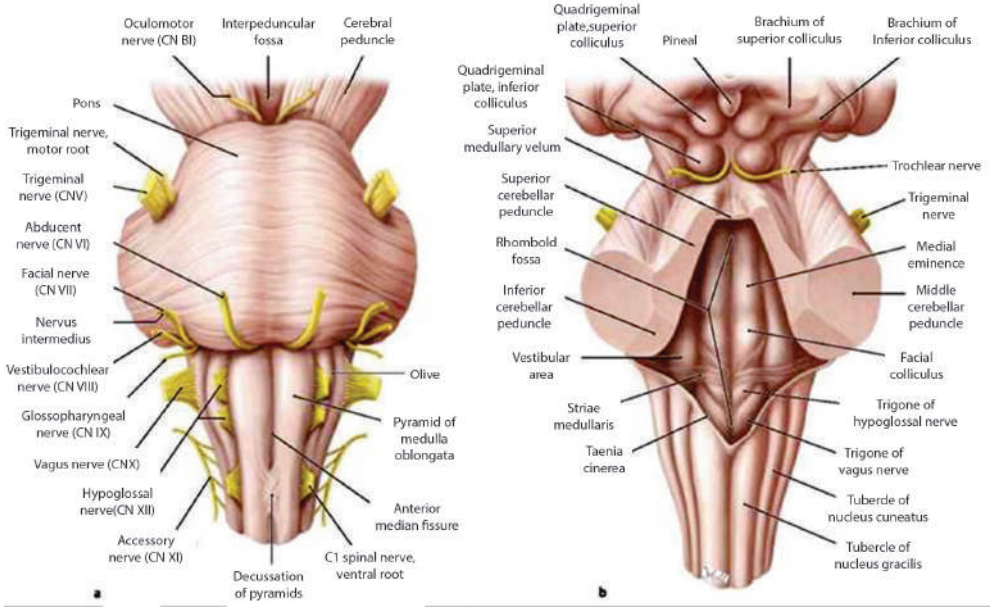


Fig. 13.16 External features of mid-brain

3] Lession in vicinity of cerebral peduncles leads to occulomotor paralysis of same side but hemiplegia of opposite side.

4] Parkinson Disease: There is degeneration of the melanin containing cells in the compact zone of substantia nigra. Dopamine is produced by neurons in the substantia nigra. It passes along the axons to basal nuclei.

In Parkinson's disease, dopamine is much reduced suggesting degeneration of pigmented nerve cells.