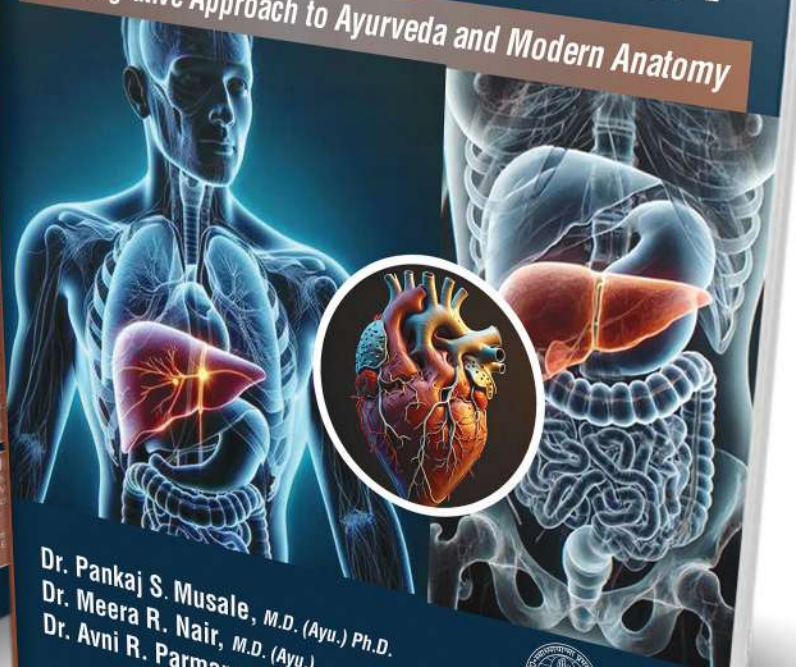
Based on the NCISM Syllabus for BAMS 1st Professional

VOL 2

A Textbook of

RACHANA SHARIRA

An Integrative Approach to Ayurveda and Modern Anatomy



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Textbook of Rachana Sharira

An Integrative Approach to Ayurveda and Modern Anatomy

(Volume 2)

As per the NCISM Syllabus for BAMS 1st Professional

by

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Salient Features of Textbook

1. **The content of textbook is meticulously designed to align with the latest N.C.I.S.M. syllabus for Rachana Sharira. This ensures that students cover all essential topics in a systematic and comprehensive manner.**

2. **At the end of each chapter, a carefully curated question bank is provided. These questions are based on the N.C.I.S.M. blueprint.**

3. **The textbook includes color images for each aspect of modern Anatomy. These high-quality, labeled images provide visual clarity and aid in better understanding of anatomical structures and their functions.**

4. **The textbook is designed with a focus on clarity and readability, using a student-friendly layout with well-organized headings, subheadings, bullet points, and highlighted key terms.**

5. **The textbook will feature most topics in tabular form, making it easier for students to understand, revise, and memorize the material efficiently. This structured approach is designed to support effective learning and retention.**

The Authors hope the textbook can provide the students with a good knowledge base on Ayurveda and Modern anatomy so that they can excel in their field of interest and examinations.

Dr. Pankaj S. Musale **Dr. Meera R. Nair** **Dr. Avni R. Parmar**

Index

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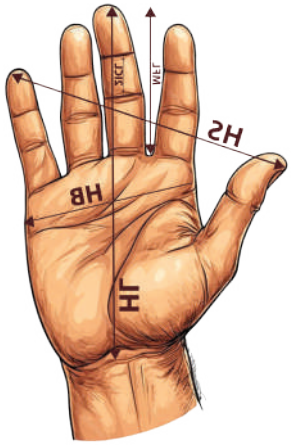


TERM 2 – (VOLUME 2 - PAPER 2)

CHAPTER

1

PRAMANA SHARIRA

Marks – 02 Questions – MCQ

Topics Covered

1.1.	Anguli pramana	MK	1.3.	Applied importance	MK
1.2.	Anjali pramana	MK			

Introduction:

- The meaning of word 'Pramana' is tool of investigation.
- There are so many tools of investigation like pratyaksa, anumana, yukti, aptopdesha, which helps person to get clear knowledge about the subject.
- Pramana pariksha described by Acharya Charaka in Vimana sthana, 8th chapter in dashvidha atur pariksha.
- The samhanana of a person is estimated by evaluating the pramana of different body parts, which is termed as pramana pariksha.

1.1 ANGULI PRAMANA

❖ Definition of Angula:

- The unit of measurement of length is angula. It is individual specific and fixed on the basis of sva-angula.

➢ स्वाङ्गुलोऽत्राङ्गुलि मध्यप्रदेशो माने ज्ञेयः। Chakrapani (Su.Su. 35/14)

Length of person's own middle phalanx of middle finger is one angula.

- मध्यमस्यपुरुषस्य मध्यमाया अङ्गुल्या मध्यमप्रकार्षो वा अङ्गलुम्। (Kautilya Artha Shastra)

  The width of middle eminence (inter-phalangeal joint) of middle finger of a person with medium stature is one angula.

- अङ्गुल शब्देनात्राङ्गुष्ठ नख तलभागं गृहयन्ति। Adhmalla (Sh. Pu. 1/35-36)

  Length of nail bed of person's own thumb is known as angula.

- अष्टौयवमध्याः अङ्गुलम् । (Kautilya Artha Shastra)

  Thickness of eight yava, placed in a row termed as one angula.

❖ Few terminology mentioned in angula Pramana:

Aayama – Length
Vistara – Width
Parinaha – Circumference
Utseda – Height

''तत्र स्वैरङ्गुलै पादाङ्गुष्ठप्रदेशिन्यौ द्वयङ्गुलायते--------''

----तत्प्रमाणा पुरुषस्य कटी, सविंशमङ्गुलशत पुरुषायम इति। (Su.Su. 35/12)

- प्रमाणतश्चेति, शरीरप्रमाणं पुनर्यथास्वेनाङ्गुलि, प्रमाणेनोपदेक्ष्यते उत्सेधविस्तारायामैर्यथा क्रमम् -------।

------केवलंपुनः शरीरमङ्गुलिपर्वाणि चतुरशीतिः। (Cha.Vi. 8/117)

- प्रमाणं पुनः स्वाङ्गुलैः।----------

----------सर्वं पुनः शरीरमङ्गुलानि चतुरशीतिः। (A.S. Sa. 8/30)

Table No. 1.1: Angula pramana of different body parts.

Aayama-A, Vistara-V, Parinaha-P, Utseda-U

Name of body part	Acharya Sushruta				Acharya Charaka				Acharya Vagbhatta			
Upper limb	**A**	**V**	**P**	**U**	**A**	**V**	**P**	**U**	**A**	**V**	**P**	**U**
Angustha	3 ½								3 ½			
Pradeshini	4 ½								4 ½			
Madhyama	5								5			
Anamika	4 ½								4 ½			
Kanistika	3 ½								3 ½			
Prapani					15				15			
Pani									12			

Hasta Tala	6	4						4				
Angusthamula Pradeshini	5							4				
Manibandha Kurpara	16											
Hasta	24				12							
Prabahu					16				16			
Bhuja	32											
Skandha					8				8			
Amsa					6				6			
Kaksha					8				8			
Manibandha			12									
Prakostha			12									
Indrabasti			16									
Amsapitha Kurpara Antarayama	16											
Lower Limb	**A**	**V**	**P**	**U**	**A**	**V**	**P**	**U**	**A**	**V**	**P**	**U**
Padangustha	2								2			
Pradeshini	2								2			
Madhyama	9/5								9/5			
Anamika	8/5								8/5			
Kanistika	7/5								7/5			
Prapada	4	5							4	6		
Pada Tala	4	5							4	5		
Parshni	5	4						4	4	4		
Pada	14		14		14	6		4	14		14	4
Jangha	18		14		18		16		18		14	
Janu			14		4		16		4			

Uru + janu	50											
Gulpha			14						14		14	
Uru	18		32		18		30		18	6	30	
Trunk	**A**	**V**	**P**	**U**	**A**	**V**	**P**	**U**	**A**	**V**	**P**	**U**
Vrushana/ Muska	2				6		8		6		5	
Mehana/ Medhra	4								6		5	
Bhaga			12				12					
Mehana-Nabhi	12											
Nabhi-Hridaya	12											
Hridaya-Griva	12											
Purush Urah						24		12		24		12
Kati		18				16				16	50	
Bastishira					10				10			
Udara					12	10			12			
Parsva					12	10			12	10		
Stana					2				2			
Stanantara		12				12				12		
Stri Urah		18										
Hridaya					2				2			
Trika								12				12
Shepha					6		5					
Prustha								18				18
Head & Neck	**A**	**V**	**P**	**U**	**A**	**V**	**P**	**U**	**A**	**V**	**P**	**U**
Chibuka	2					4						
Dashana	2											
Aanana	2						24	12			24	12
Nasa puta	2								1/3			

Karna Mula	2											
Bhunayanan-tara		2										
Vadana	4											
Nasavamsa	4				4				4			
Karna	4				4				4			
Lalata	4				4				4			
Griva	4		24									
Netra									2			
Akshimadhya						4						
Sravana-apanga	5											
Mukha	12		24									
Nasaputa Maryada		2/3 or 1/3							1/3			
Taraka		1/3 of naya-na										
Keshanta Mastaka	11											
Karnavatvantara		14										
Shirodhara							24	4			32	4
Aasya						5				5		
Austha					4				4			
Mastaka avatu keshanta	10											
Shira											32	16
Drustiantara	4											
Drusti		1/9th of taraka										

Table No. 1.2: Total Measurement of Body (in angula)

Total	Acharya Sushruta	Acharya Charaka	Acharya Vagbhatta
Height	120	84	84
Breadth		84	84

The person who has pramana of his body parts as mentioned above known as pramanavata sharira. If measurements are less than the standard then hina pramana and if measurement are more that the standard then adhika pramana.

❖ Proper Age for Measuring Body Part :

➢ पञ्चविंसे ततो वर्षे पुमान् नारी तु षोडशे। समत्वा गतवीर्यो तौ जानीयात् कुशलो भिषक्।। (Su.Su. 35/13)

समत्व आगतवीर्ययोः एव यथा उक्तं प्रमाणं भवति। Dalhana (Su.Su. 35/13)

In male 25 year and 16 year in female by this time all the body parts will get fully developed and will have pramana.

1.2 ANJALI PRAMANA

❖ Definition:

The unit of measurement of liquid material is known as Anjali

➢ अंजलिस्तु करद्वयमिलित संपुटाकारः प्रसिद्धः। Adhmalla (Sh. Pu. 1/25)

The cavity which is formed while keeping the two palms together is known as anjali.

❖ Anjali Pramana of different materials of Body:

➢ तद्यथा दशोदकस्यांजलयः शरीरे स्वेनांजलि प्रमाणेन ----तावदेव श्लैष्मिकस्यौजस्य इति । (Cha.Sa. 7/15)

➢ मज्जामेदो वसामूत्र पित्तश्लेष्म शकृन्त्यसृक् । रसो जलं च देहेऽस्मिन्नैकैकांजलि वर्द्धितम् ।।

➢ पृथक स्वप्रसृतं प्रोक्तमोजोमस्तिष्करेतसाम् । द्वावंजली तु स्तन्यस्य चत्वारो रजसः स्त्रियः।। (A.H.Sa. 3/80-81)

Table no.1.3: Anjali Pramana of different materials of Body.

Name of Material	Acharya Charaka	Acharya Vagbhatta
Udaka/Jala	10 anjali	10 anjali
Rasa	9 anjali	9 anjali
Rakta/Asruka	8 anjali	8 anjali
Purisha/Shakruta	7 anjali	7 anjali
Sleshma	6 anjali	6 anjali
Pitta	5 anjali	5 anjali
Mutra	4 anjali	4 anjali
Vasa	3 anjali	3 anjali

Meda	2 anjali	2 anjali
Majja	1 anjali	1 anjali
Mastishka	1/2 anjali	1 prastha
Shukra/Retasa	1/2 anjali	1 prastha
Apara oja	1/2 anjali	
Para oja	8 bindu	
Oja		1 prastha
Stanya		2 anjali
Raja		4 anjali

1 Prastha = 1/2 anjali

1.3 APPLIED IMPORTANCE

➢ विशेषतोऽङ्गप्रत्यङ्गः प्रमाणादथ सारतः। परीक्ष्यासुः सुनिपुणो भिषक् सिध्यति कर्मसु ।। (Su.Su. 35/17)

Before starting the treatment of a patient, one should ascertain his ayu and pramana pariksha.

➢ देहः स्वैरङ्गुलैरेष यथावदनुकीर्तितः । युक्तः प्रमाणेनानेन पुमान् वा यदि वाऽङ्गना।।

➢ दीर्घमायुरवाप्नेति वित्तं च महदच्छति । मध्यमं मध्यमैरायुर्वित्तं हीनैस्तथाऽवरम् ।। (Su.Su. 35/14-15)

If a person has all his body parts with normal measurement, then he will have benefits such as longevity and prosperity.

If the measurements are medium, then he will have medium lifespan and prosperity.

If the measurements are lower than the standard, then he will have less lifespan and prosperity.

➢ स्वं स्वं हस्तत्रयं सार्द्धं वपुः पात्रं सुखायषोः । न च यद्युक्तमुद्रिक्तैरष्टाभिर्निन्दितैर्निजैः।। (A.H.Sa. 3/106)

Height of human is 3 $^{1}/_{2}$ hasta. Person who has this normal height will possess health and longevity.

But it is not so in person belongs to any of asta nindita category like aroma, atiroma, atisveta, atikrishna, atisthula, atikrisha, atihrasva, atideergha.

➢ तत्रायुर्बलमोजः सुखमैश्वर्यं वित्तमिष्टाश्चापरे भावा भवन्त्यायत्ताः प्रमाणवति शरीरे ।

➢ विपर्ययस्ततो हीनेऽधिके वा। (Cha.Vi. 8/117)

The person who has normal pramana will possess longevity, good strength, happiness, prosperity, wealth. If pramana are more or less, then health etc will change accordingly.

Question Bank - Pramana Sharira

MCQs

1. How many types of pramana are there?
   a) 3 c) 2
   b) 4 d) 1
2. Which of the following are the type of pramana?
   a) Anguli pramana c) Both
   b) Anjali pramana d) None
3. According to Sushruta Acharya, what is the length of human body?
   a) 120 angula c) 84 angula
   b) 50 angula d) 100 angula
4. According to Charaka Acharya, what is the length of human body?
   a) 120 angula c) 84 angula
   b) 50 angula d) 100 angula
5. What is the pramana of angustha?
   a) 1 angula c) 3 angula
   b) 4 angula d) 2 angula
6. Which of the following has 2 angula pramana ?
   a) Karna (ear) c) Danta (teeth)
   b) Nasa (nose) d) Griva (neck)
7. What is the pramana of jangha ?
   a) 18 angula c) 20 angula
   b) 8 angula d) 11 angula
8. What is the pramana of tarjani (index finger)?
   a) 5 angula c) 3 angula
   b) 4 ½ angula d) 5 ½ angula
9. What is the ideal time for pramana pariksha of male?
   a) 16 year c) 25 year
   b) 20 year d) 30 year
10. What is the ideal time for the pramana pariksha of female?
    a) 12 year c) 18 year
    b) 16 year d) 20 year

11. Which of the following has 4 angula pramana?

a) Lalata (forehead) c) Nasa (nose)
b) Karna (ear) d) All of the above

12. What is the pramana of uru ?

a) 16 angula c) 32 angula
b) 20 angula d) None of the above

13. Benefits of pramana sharir are ……..

a) Diagnosis c) Both
b) Treatment d) None

14. Match the following

1.	Mukha paridhi	A)	4 A
2.	Pelvis in male	B)	18 A
3.	Pelvis in female	C)	12 A

a) 1-A 2-C 3-B c) 1-C 2-B 3-A
b) 1-A 2-B 3-C d) 1-B 2-C 3-A

15. 1 Anjali means …….

a) 120 ml c) 200 ml
b) 180 ml d) 240 ml

16. Which is not in measurements of 2 angula pramana?

a) Danta c) Eye brow
b) Nasa d) Scortum

17. Which of the following has 1/3 angula pramana ?

a) Mukha Paridhi c) Mukha Vistara
b) Nasaputa d) Avtak

18. Match:

1.	Udaka	A)	5
2.	Rakta	B)	10
3.	Pitta	C)	3
4.	Vasa	D)	8

a) 1-B 2-D 3-A 4-C (c) 1-D 2-C 3-B 4-A
b) 1-D 2-C 3-B 4-A d) 1-B 2-A 3-C 4-D

19. What is the pramana of ayama?

a) 7 angula
b) 8 angula
c) 4 angula
d) 6 angula

20. Match the following

1.	Eye Brow	A)	12
2.	Penis	B)	5
3.	Middle Finger	C)	4
4.	Mouth	D)	2

a) 1-A 2-B 3-C 4-D
b) 1-D 2-C 3-B 4-A
c) 1-D 2-C 3-B 4-A
d) 1-C 2-A 3-D 4-B

21. Pramana of Mastishka…… anjali.

a) ½
b) 1
c) 2
d) 5

22. Pramana of indrabasti ……

a) 20 angula
b) 18 angula
c) 16 angula
d) 14 angula

23. Ideal time for pramana pariksha ?

a) Morning time
b) Afternoon
c) Evening
d) Late night

24. Which are not in measurement of 4 angula pramana ?

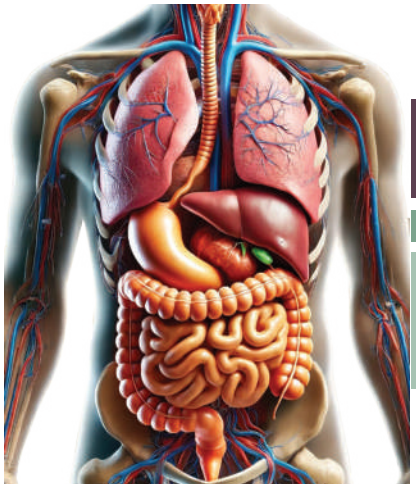
a) Lalata (forehead)
b) Karna (ear)
c) Nasa (nose)
d) Danta (teeth)

25. Which pramana used to measure the liquid entities of the body?

a) Anjali pramana
b) Anguli pramana
c) Both
d) None

Answer Key												
1	2	3	4	5	6	7	8	9	10	11	12	13
c	c	a	b	d	c	a	b	c	b	d	a	a
14	15	16	17	18	19	20	21	22	23	24	25	
a	b	b	b	a	d	b	a	a	b	d	a	

❑❑❑



CHAPTER 2

KOSHTA EVAM AASHAYA SHARIRA

Marks – 04 Questions : MCQ, SAQ, LAQ

Topics Covered

2.1	Definition of koshta and aashaya.	MK
2.2	Describe the concept of various numbers of koshtanga as per samhitas	MK
2.3	Describe the concept of various numbers of aashaya as per samhitas.	MK
2.4	Describe and explain applied anatomy of koshta and aashaya.	NK

2.1 DEFINITION OF KOSHTA AND AASHAYA

(a) Koshta:

➢ कोष्ठः पुनरुच्यते महास्रोतः शरीरमध्यं महानिम्नमाम पक्वाशयश्चेति पर्यायशब्दैस्तन्त्रे स रोगमार्गआभ्यन्तरः।
(Cha. Su.11/48)

As per Charaka Samhita koshta is same as the mahasrotas, also known as mahanimna and is the central part of the body. The pakvashaya and amashaya are its part and is known as amapakvasaya. This is the abhyantara rogamarga.

➢ स्थानान्यमाग्नि पक्वानां मूत्रस्य रुधिरस्य च । हृदुण्डूकः फुप्फुसश्च कोष्ठ इत्यभिधीयते ।। (Su.Chi. 2/12)

According to Sushruta Samhita koshta is the visceral cavity where the internal organs are present. The internal organs are aamashaya, agnyashaya, pakvashaya, mootrashaya, rakthashaya, hridaya, unduk, phuphusa.

➢ अन्तः कोष्ठो महास्रोत आमपक्वाशयाश्रयाः। (A.H. Su.12/46)

Vagbhata Acharya explains that the mahasrotas is the internal pathway of a disease and it is termed as 'anthahkoshta'.

(b) Aashaya:

➢ आशेते द्रव्यमस्मिन्नित्याशयः।

Aashaya means seat, and can be said as the place where something resides.

➢ आश्रित्य शेते द्रव्यं अस्मिन् इति आशयः।

The place where dravya lies/resides is known as aashaya.

➢ आशेरेते दोषधातुमलायेषु ते आशयः।

The place where Dosha, Dhatu, and Mala reside is known as Aashaya.

2.2 DESCRIBE THE CONCEPT OF VARIOUS NUMBER OF KOSHTANGAS AS PER THE SAMHITAS.

Koshtangas are the viscera of koshta. The koshta is divided into three group Uroguha, Udaraguha, Shroniguha.

➢ स्थानान्यामग्नि पक्वानां मूत्रस्य रुधिरस्य च । हृदुण्डुक फुप्फूसश्च कोष्ठ इत्यभिधीयते ।। (Sa.Chi. 2/12)

According to Sushruta Samhita, there are 8 koshtanga and they are, aamashaya (stomach), agnyashaya (pancreas), pakvashaya (intestine), mutrashaya (urinary bladder), raktashaya (liver and spleen), hridaya (heart), unduka (caecum), phuphusa (lungs).

➢ पंचादश कोष्ठाङ्गानि; तद्यथा-नाभिश्च, हृदयंच, क्लोमच, यकृतच, प्लीहाच, वृक्कौच, बस्तिच, पुरीषाधारश्च, आमाशयश्च, पक्वाशयश्च, उत्तरगुदंच, अधरगुदंच, क्षुद्रान्त्रं च, स्थूलान्त्रंच, वपावहनंचेति। (Cha.Sa. 7/10)

According to Charaka Samhita, there are 15 koshtanga and they are: nabhi (umbilicus), hrudaya (heart), kloma (pancreas) yakrit (liver), pleeha (spleen), vrukka (kidney), basti (urinary bladder), purishadhara (caecum), aamashaya (stomach), pakvashaya (intestine), uttaraguda (rectum), adharaguda (anus), kshudrantra (small intestine), sthulantra (large intestine), vapavahanam (omentum)

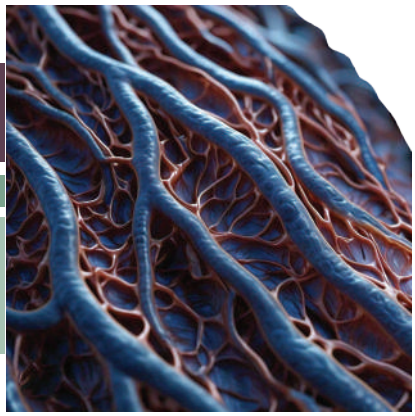
➢ कोष्ठङ्गानि स्थितान्येषु हृदयं क्लोम फुप्फुसम् । यकृत्प्लीहोण्डुकं वृक्कौ नाभि डिम्भान्त्र बस्तयः।।(A.H.Sa. 5/12)

According to Ashtanga Hrudaya; there are 11 koshtanga; they are: hrudaya (heart), kloma (pancreas), phuphusa (lungs), yakrut (liver), pleeha (spleen), unduka (caecum), vrukka (kidney), nabhi (umbilicus), dimbha (ovary), aantra (intestines), basti (urinary bladder).

CHAPTER 3

TERM 2 – (VOLUME 2 - PAPER 2)

SIRA SHARIRA



Marks – 04 Questions – MCQ, SAQ, LAQ

Topics Covered

3.1	Define Sira, enumerate them and state Its nirukthi.	MK
3.2	Explain the classification of Sira	MK
3.3	Define vedhya sira and enumerate them	MK
3.4	Define avedhya sira and enumerate them	MK
3.5	Locate vedhya sira in the body according to region.	MK
3.6	Describe the applied anatomy of siravedha	DK

3.1 DEFINE SIRA, ENUMERATE THEM AND STATE ITS NIRUKTHI

➢ सरणात् सिराः। (Ch.Su.)

Charaka samhita states that sira means 'that which flows', chakrapani opines that 'saranah' means to move from one place to another.

➢ पद्मिनी कन्दाद्विसादीनां यथा जलम् । (Su.Sa. 4/36)

Sushruta states that like lotus stalk get rooted at the bottom of the pond and spread all over the pond, likewise sira originates from the nabhi and spreads all over the body

➢ दशमूल सिरा हृत्स्थास्ता सर्व सर्वतो वपुः । रसात्मकं वहन्त्योजस्तनिम्बद्धं द्वि चेष्टितम् ।। (A.H.Sa. 3/18)

The Vagbhatta Acharya states that the siras originate from the Hrudaya and carries the ojas to all parts of the body. Moola sira are 10 in number.

According to Sharangdhara the siras tie the sandhis and helps to keep it in position. It carries doshas and dhatus and it originates from the nabhi and spreads all over the sharira.

CHAPTER 4

DHAMANI SHARIRA

Marks – 02 Questions – MCQ, SAQ, LAQ

Topics Covered

4.1	Define Dhamani and state its Nirukthi	MK
4.2	Explain the classification of Dhamani	MK
4.3	Locate the Dhamanis in the body according to region	DK

4.1 DEFINE DHAMANI AND STATE ITS NIRUKTHI

➢ **ध्मानाद्धमन्यः ।**(Cha.Sa. 30/12)

According to Charaka, that which pulsate is known as dhamani.'Dhmaana' means to swell and contract. Chakrapani comments that Dhmaana means to be filled with rasa etc. from outside.

➢ **धमन्यो रसवाहिन्यो धमन्ति पवनं तनौ।** (B.P.)

The above verse explains that dhamnis are carriers of rasa and vayu, from this correlation it can be inferred that dhamanis are artery that carry blood and oxygen.

➢ **यथा स्वभावतः खानि मृणालेषु बिसेषु च । धमनीनां यथा खानि रसौयैरुपचीयते।।** (Su.Sa. 9/10)

Dhamanis have channels inside them like the lotus stalk, these hollow channels transport rasa throughout body and nourishes it.

4.2 EXPLAIN CLASSIFICATION OF DHAMANI

➢ **चतुर्विंशतिर्धमन्यो नाभिप्रभवा अभिहिताः।** (Su.Sa. 9/8)

There are 24 dhamanis in the body that arise from nabhi, here nabhi can be considered as umbilicus during the fetal period and hrudaya after birth.

TERM 2 – (VOLUME 2 - PAPER 2)

CHAPTER 5

SROTO SHARIRA

Marks – 07 Questions – MCQ, SAQ, LAQ

Topics Covered

5.1	Definition Srotas and state its Nirukthi and types	MK
5.2	Explain classification of Srotas	MK
5.3	State the moolasthana of all srotas as per AAcharya Sushruta and-Charaka with its clinical aspect	MK

5.1 DEFINE SROTAS AND STATE ITS NIRUKTHI AND TYPES

➢ स्रवणात् स्रोतांसि।

The word sravana denotes flowing or oozing and the term srotas is called so since they transport dhatus /nutrients.

➢ मूलात् खादान्तरं देहे प्रसृतंत्वभिवहियत् । स्रोतस्तदिति विज्ञेयं सिरा धमनि वर्जितम् ।। (Su.Sa. 9/25)

Srotas are that channels which carry rasa or nutrients which oozes out of mool-achidra and spread in the body.

➢ स्रोतांसि खलु परिणाममापद्यमानानां धातुनामभिवाहीनि भवन्त्यथनाथैन। (Cha. Vi. 5/3)

Charaka Samhita states that srotas are passages for transporting nutrients or by products which have undergone transformation

➢ जीवितायतनान्यन्तः स्रोतास्याहुस्त्रयोदशः। प्राणधातुमलाम्भोन्नवाहीनि--------।। (A.H.Sa. 3/41)

Vagbhata Acharya explained that there are about 13 antharmugha srotas and they carry pranavayu, Dhatus, Mala, Anna etc.

Types:-

➢ यावन्तः पुरुषे मूर्तिमन्तोभावविशेषास्तावन्त एवास्मिन् स्रोतसां प्रकारविशेषाः।सर्वेहिभावापुरुषे नान्तरेणस्रोतास्यभिनिर्वर्तन्ते, क्षयं वाऽप्यागिच्छन्ति। (Cha.Vi. 5/3)

CHAPTER

6

KALA SHARIRA

Marks – 04 Questions : MCQ, SAQ, LAQ

Topics Covered

6.1 DEFINITION, FORMATION AND FUNCTIONS OF KALA

Definition of Kala:

➢ कलाः खल्वपि सप्त भवन्ति धात्वाशयान्तर मर्यादाः । (Su. Sa 4/5)

दधतीती धातवो रसरक्तामांसादयः कफपित्तपुरीषाण्यापि प्राकृतानि स्वकर्मणा दधतीती धातवःतेषामाशया अवस्थान प्रदेशा धात्वाशयाः, तेषामन्तरेषु मर्यादा सीमाभूता इत्यर्थः ।। (Dalhan Su. Sa. 4/5)

The kala is the structure which intervenes between dhatu and ashaya. There are seven layers of kala which are present in between dhatu and ashaya. The word dhatu indicates rasa, rakta, mansa etc which is also used for dosha like pitta, kapha and also for mala like purisha. These all dhatu are normally functioning in their own ashaya i.e. Avasthan Pradesh and it is known as dhatvashaya e.g. raktashaya, pittashaya etc. The borderline between these ashayas is called as kala.

Formation of Kala:

➢ धात्वाशयान्तर क्लेदो विपक्वः स्वंस्वमूष्मणा ।।
श्लेष्मस्नाय्वपराच्छन्नः कलाख्यः काष्ठसारवत् । (A.H. Sa 3/9)

Kleda present inside the dhatu and ashaya processed by their own agni i.e. dhatvagni becomes transformed into structures called kala, just as getting essence from trees. For example, by the action of Shukra dhatushma in shukra

CHAPTER 7

INDRIYA SHARIRA

Marks – 03 Questions – MCQ, SAQ, LAQ

Topics Covered

7.1 NIRUKTI

➢ इंदति तत् इन्द्रियम्

Inah = Objects of perception

Dra = To flow, to run, to melt

Indriya is formed from the union of two words 'inah' and 'dra'. Indriya are those special structures which move towards the subjects and subject gets dissolved in them.

➢ विषयान् प्रतिधावन्ति इति इन्द्रियाणि।

Indriya are those special structures in the body which move towards the indriyartha.

➢ इन्द्रं आत्मा तस्य साधनं इन्द्रियम् । इन्द्रयस्य आत्मनो लिङ्गं इन्द्र + घ।

ज्ञानक्रिया साधने । (Vachaspatyam)

The word indra is a synonym for atma and indriya are the tools of atma through them atma perceives the jnana.

CHAPTER 8

TERM 3 – (VOLUME 2 - PAPER 2)

TWACHA SHARIRA

Marks – 03 Questions – MCQ, SAQ, LAQ

Topics Covered

8.1	Definition	MK
8.2	Types and characteristics of twacha with Its clinical importance	MK
8.3	Significance of twacha adhisthana in disease manifestation.	MK
8.4	Its relation with dhatu.	Mk

8.1 A) DEFINITON

➢ स्पर्शत्यनेनिति स्पर्शनम् । Chakrapani (Cha.Su. 8/8)

The indriya which perceives the sensibility of touch known as sparsanendriya.

- Twaka is the adhisthana of sparsanendriya.

8.1 B) UTPATTI

➢ यानि खल्वस्य गर्भस्य मातृजानि----- । तद्यथा त्वक् च लोहितं च---- । (Cha.Sa. 3/6)

Twaka formed as a matruja bhava.

8.2 A) TYPES

➢ तस्य खलु एवं प्रवृत्तस्य शुक्र शोणितस्य अभिपच्यमानस्य क्षीरस्यैव सन्तानिकाः सप्त त्वचो भवन्ति। (Su.Sa. 4/4)
तत्र सप्तत्वचोऽसृजः।
पच्यमानात्प्रजायन्ते क्षीरात्सन्तानिका इव ।। (A.H.Sa. 3/8-9)

The seven layers of twaka are formed when the combination of shukra and shonita undergo paka just like how the layer of santanika (cream) is formed on boiling the milk.

CHAPTER 9

TERM 2 – (VOLUME 2 - PAPER 2)

MARMA SHARIRA

Marks –15

Questions – LAQ, SAQ, MCQ

Topics Covered

9.1 Define marma and enumerate them.
9.2 Describe marma and prana tatva with its significance.
9.3 Discuss the classification of marma.
9.4 Narrate the importance of marma in sharir and shalya vigyan
9.5 Illustrate the specific location of marma as per susruta samhita.
9.6 Demonstrate the marma location as per modern anatomy
9.7 Explain trimarma.

9.1 DEFINE MARMA AND ENUMERATE THEM

➢ मर्माणि नाम मांस सिरा स्नायु संध्य स्थिसन्निपातास्तेषु स्वभावत एव प्राणास्तिष्ठन्ति। (Su.Sa. 6/10)

Marmas are the meeting place of mamsa, sira, snayu, asthi and sandhi and the pranas are specifically situated in these marmas by the virtue of their nature and any trauma to any one of these cause problems in the body.

➢ सोममारुततेजांसि रजः सत्वतमांसि च । मर्मसु प्रायशः पुंसां भूतात्मा चावतिष्ठते।।
मर्म स्वभिहता तस्मान्न जीवन्ति शरीरिणः ।। (Su.Sa. 6/37)

Marma are seat of soma, maruta, tejas, triguna i.e. satva, raja, tamas and bhutatma, hence any injury to these results in death of the person.

➢ सप्तोत्तरं मर्म शतकस्मिञ्छरीरे स्कन्ध शाखासमाश्रितमग्निवेश।
तेषाम्न्यतम पीडांया समधिका पीडां भवति चेतना निबन्ध वैशेष्यात् ।। (Cha. Si. 9/3)

These are 107 marmas or vital areas in the body and they are located in the trunk and sakhas and injury to any of these causes severe pain and discomfort as there is chetana dhatu in these marmasthanas.

3. Stana Rohita:

➢ स्तनचूचुकयोरूर्ध्व द्रव्यङ्गलमुभयतः स्तनरोहितौ नाम तत्र लोहितपूर्णकोष्ठतया कास श्वासाभ्यां च म्रियते।

(Su.Sa. 6/26)

Location	Two finger above the nipple on each side
Sankhya	02
Pramana	Ardha angula
Rachana	Mamsa Marma
Parinama	Kalantar pranahara marma.
Viddha lakshana	Delayed death due to Hae-mothorax, cough and Dys-ponea.

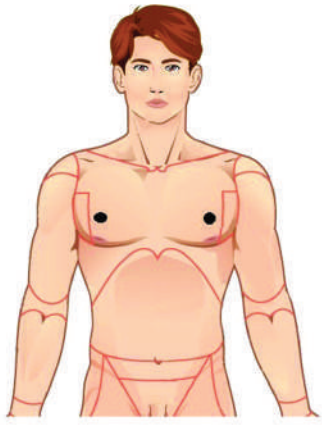


Fig. 9.30 Sthanarohita

4. Apalapa:

➢ अंसकूटयोरधस्तात् पार्श्वोपरिभागयोरपलापौ नाम, तत्र रक्तेन पूयभावं गतेन मरणं। (Su.Sa. 6/26)

Location	Located below shoulder joint anteriorly b/w spine and chest.
Sankhya	02
Pramana	Ardha angula
Rachana	Sira marma
Parinama	Kalantar pranahara marma.
Viddha lakshana	Pyemia resulting in delayed death.

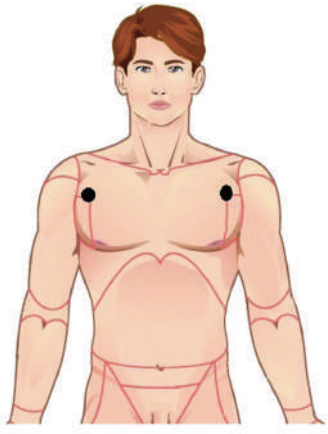


Fig. 9.31 Apalapa

5. Apasthambha:

➢ उभयत्रोरसो नाड्यौ वातवहे अपस्तम्भौ नाम, तत्र वातंपूर्णकोष्ठतया कासश्वासाभ्या च मरणम्। (Su.Sa. 6/26)

Location	Situated on both sides of chest as two vata carrying nadis.

E. URDHVA JATRU MARMA

1. Nila and Manya:

➢ तल कण्ठनाडी मुभयतश्चतस्रो धमन्यो द्वे नीले द्वे च मन्ये व्यत्स्यासेन, तत्रमूकता स्वश्चैकृतमरस ग्राहिता। (Su.Sa. 6/27)

Location	There are four dhamanies, among them two are nila and two are manya situated on either side of the kanthnadi.
Sankhya	O4- (2 Nila and 2 manya (One on each side)
Pramana	4 Angula
Rachana	Sira marma
Parinama	Vaikalyakara marma
Viddha lakshana	Loss of speech, defective voice and loss of taste.

Fig. 9.40 Nila and Manya

2. Matruka:

➢ ग्रीवायमुभयतश्चतस्त्र सिरा मातुका; तत्र सद्योमरणम् । (Su.Sa. 6/28)

Location	Situated at the root of the neck
Sankhya	08 (Four on each side)
Pramana	4 Angula
Rachana	Sira Marma
Parinama	Sadyo pranahara marma
Viddhalakshana	Sudden death.

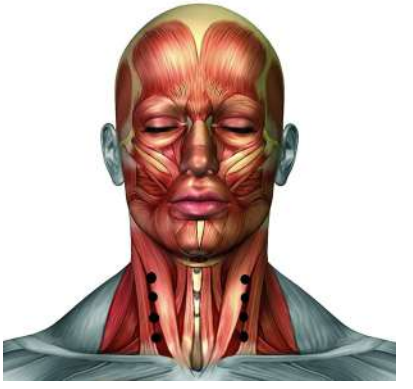


Fig. 9.41 Matruka

3. Krikatika:

➢ शिरोग्रीवयो: सधाने कृकाटिकेनाम, तत्रचलमूर्धता। (Su.Sa. 6/27)

Location	Situated at the junction of head and neck
Sankhya	02
Pramana	Ardha angula
Rachana	Sandhi marma
Parinama	Vaikalyakara marma
Viddha lakshana	Instability of head.

Fig. 9.42 Krikatika

CHAPTER 10

TERM 2 – (VOLUME 2 - PAPER 2)

RESPIRATORY SYSTEM

Marks – 10 Questions – MCQ, SAQ

Topics Covered

10.1 BRONCHIAL TREE

Introduction:

The bronchial tree is the term which refers to the bronchi and their subsequent branches.

(a) Primary bronchus/Principle bronchus: - The trachea at the level of 4th thoracic vertebra bifurcates into two primary or principle bronchi. Right primary bronchus is 2.5 cm long while left primary bronchus is 5 cm long. Right primary bronchus is shorter, wider and more in line with trachea while left primary bronchus is longer, narrower and oblique. The infection on right side is common because inhaled particles can easily enter to the lung as compared to left side.

(b) Secondary/lobar bronchus: - The primary bronchus of both sides enters into the lungs through hilum. Each primary bronchus divides into secondary or lobar bronchioles which enter into each lobe of lungs. There are 3 lobar bronchi on right side while 2 lobar bronchi on left side.

(c) Tertiary/segmental bronchus: - Every secondary or lobar bronchus further divides into tertiary or segmental bronchus for each bronchopulmonary segment. As there are 10 bronchopulmonary segments in each lung, 10 tertiary bronchi present on both side lungs.

10.6.4. Extent (MK):

It extends from the root of tongue to the trachea in adult male it lies at level of C3 to C6 vertebrae while in adult female and children it lies little on higher level of C1 to C4 vertebrae.

10.6.5. External features (MK)

- Larynx is formed by skeletal framework of cartilage.
- The wall of larynx is formed by nine pieces of cartilage.
- The cartilages of larynx are connected by joints, ligaments and membranes.
- The cavity of larynx is the space extending from entrance of larynx to inferior border of cricoid cartilage. The cavity is line by mucus- membrane.

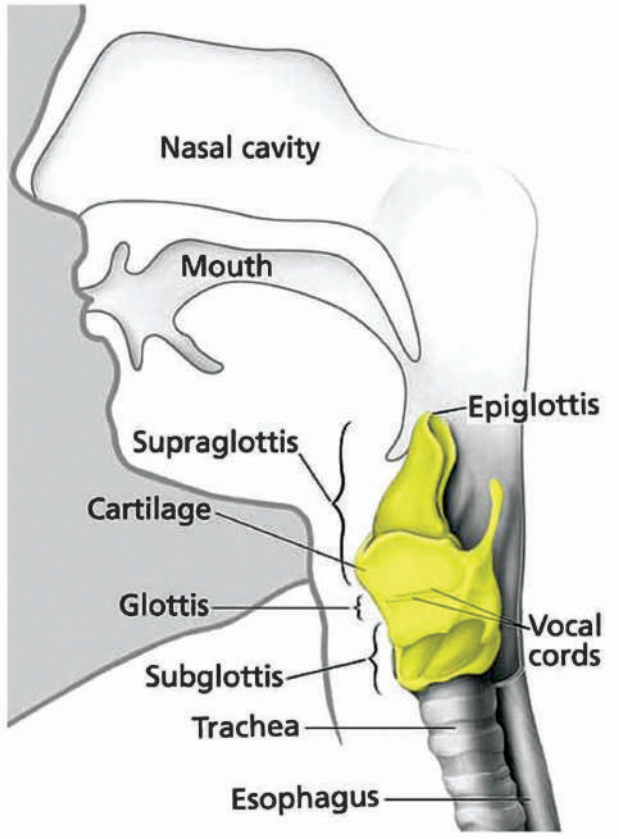


Fig. 10.6 Larynx

10.6.6 Cartilages of larynx (MK)

Larynx consists of 3 unpaired and 3 paired cartilages.

3 unpaired cartilages- Thyroid cartilage
Cricoid cartilage
Epiglottic cartilage

3 paired cartilages- Arytenoids cartilage
Corniculate cartilage
Cuneiform cartilage

10.6.7. Relations of larynx (DK)

Laryngeal ligaments and membrane

Extrinsic

(a) The thyrohyoid membrane
(b) The hypo-epiglottic ligament
(c) Cricotracheal ligament

2) **Costal origin-** from inner surface of costal cartilage.

3) **Lumbar origin-** from lumbar vertebrae

10.2.3. Insertion

All the fibers forms costal tendon which lies behind the lower end of sternum and fuses with pericardium.

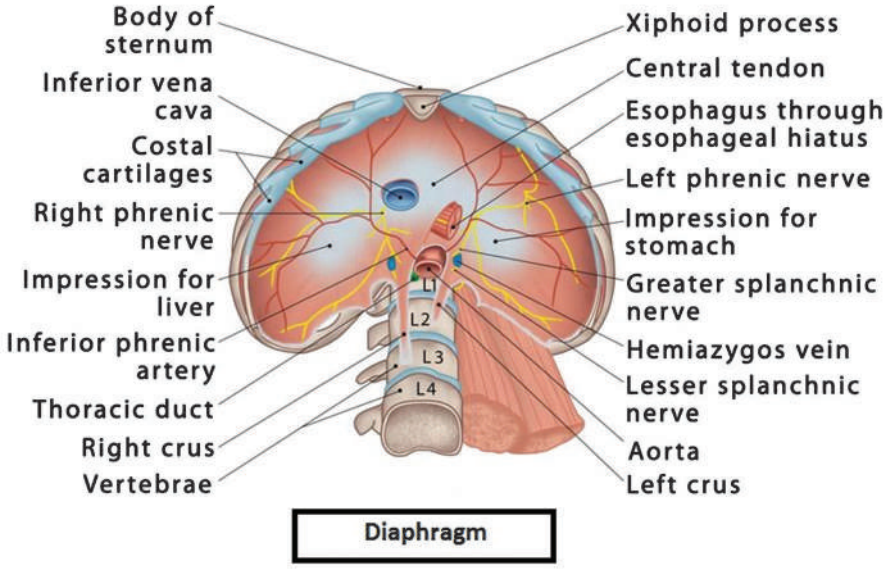


Fig. 10.8 Diaphragm

10.8.4 Parts of diaphragm

It consists of two parts right crus and left crus.

A) **Right crus:** It arises from anterolateral surfaces of bodies of upper 3 lumbar vertebrae.

B) **Left crus:** It arises from upper two lumbar vertebrae.

Direction of muscle fibers

The muscle fibers are directed upwards and inwards to form right dome and left dome of diaphragm. The right dome reaches up to 4th rib and left dome reaches up to 5th rib

10.8.5 Openings in the diaphragm

1) Large openings:

a) **Aortic opening -** It is present at the level of T12 vertebra which transmits -

CHAPTER

11

TERM 1 – (VOLUME 2 - PAPER 2)

DIGESTIVE SYSTEM

Marks –12

Questions – SAQ, MCQ, LAQ

Topics Covered

11.1 PERITONEUM (GREEK STRETCHED OVER)

Introduction: The peritoneum is a large serous membrane which lines the abdominal cavity.

Layers of Peritoneum: It consist of 2 layers namely-

a) An outer layer/ Parietal layer

b) An inner layer/ Visceral layer

A] **Parietal Peritoneum:** It is innermost layer of anterior abdominal wall. It is loosely attached to the walls by extraperitoneal connective tissue. Embryologically it is developed from somato-pleuric layer of the lateral plate mesoderm. Histologically it is made up of fibrous tissue. It is pain sensitive because of the somatic innervation.

B] **Visceral Peritoneum:** It is outermost layer of viscera. It is firmly attached to viscera and forms the part of viscera. It is derived embryologically from splanchno-pleuric layer of lateral plate mesoderm. Histologically it is com-

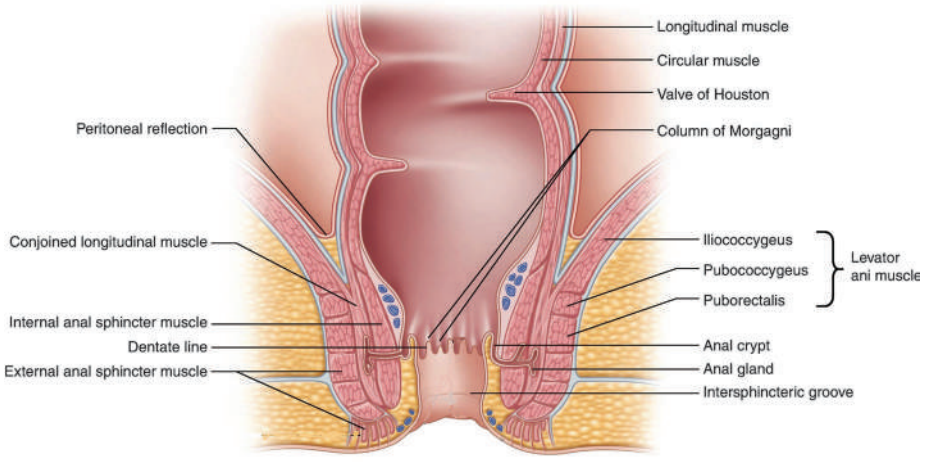


Fig. 11.15 Anal canal

Relations: Anteriorly- In males: Membranous urethra, bulb of penis and perineal body

In females: Lower end of vagina and perineal body

Posteriorly- Anococcygeal ligament

Tip of coccyx

Laterally- Ischioanal fossae

Interior of anal canal:

Interior of anal canal is divided into three parts.

1] Upper part or mucous part

2] Middle part or pectane

3] Lower part or cutaneous part

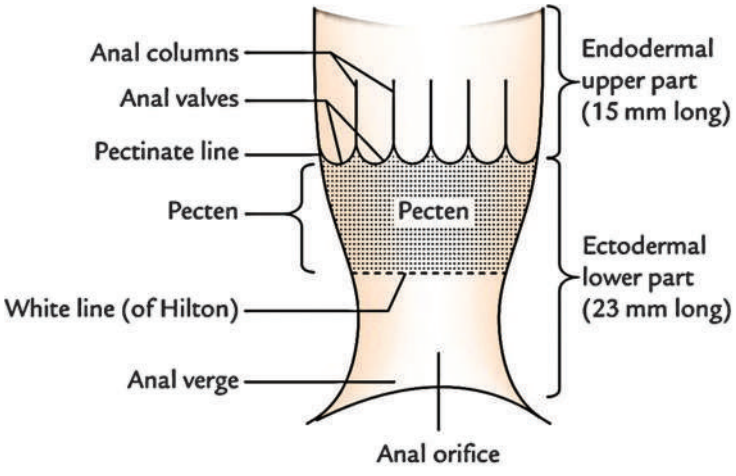


Fig. 11.16 Interior of anal canal

Color: Reddish brown

Shape: Wedge shaped

Weight: 1.6 Kg in male and 1.3 Kg in female

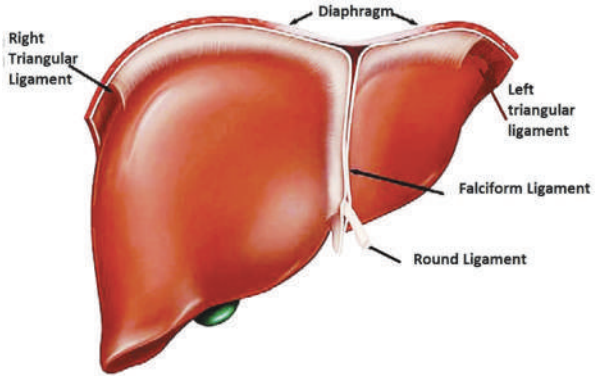


Fig. 11.19 Anterior surface of liver

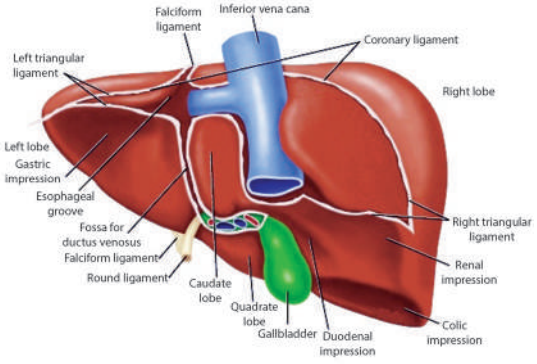


Fig. 11.20 Posterior surface of liver

External features:

Liver consist of 5 surfaces, one border and two lobes.

Surfaces-

1) **Anterior surface:** It is triangular and slightly convex. It is divided by falciform ligament.

   Relations: It is related to anterior abdominal wall and xiphoid process. It is related to diaphragm on each side.

2) **Posterior surface:** It is also triangular in shape. Its middle part shows deep concavity for vertebral coloumn.

Relations:

a) There is groove for inferior vena cava on this surface on right side of concavity of vertebral coloumn.

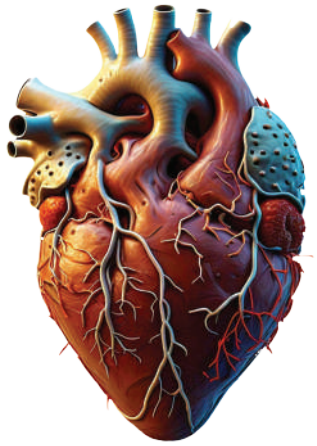
b) There is fissure for ligamentum venosum on left side of concavity.

c) There is bare area of liver on this surface which is related to diaphragm.

d) Right and left triangular ligaments which are folds of peritoneum which connects posterior surface of liver to diaphragm.

e) The caudate lobe is present on this surface.

3) **Superior surface:** It is quadrilateral in shape.



CHAPTER 12

CARDIOVASCULAR SYSTEM

Marks – 8 Questions – MCQ, SAQ, LAQ,

Topics Covered

12.1 PERICARDIUM

Introduction: It is a fibro-serous sac which encloses heart and roots of great vessels.

Location: Middle mediastinum

Layers:

1] Fibrous pericardium

2] Serous pericardium

1] Fibrous Pericardium:

It is made up of fibrous tissue and design for protection.

Relations

Anteriorly - sternum which is connected by sternopericardial ligament

Posteriorly - contents of posterior mediastinum

Location: middle mediastinum enclosed within pericardium

Weight:

300 grams in male and

250 grams in female

Position:

Heart is obliquely placed behind the body of sternum so that one third of it lies to the right and two third of it lies to the left.

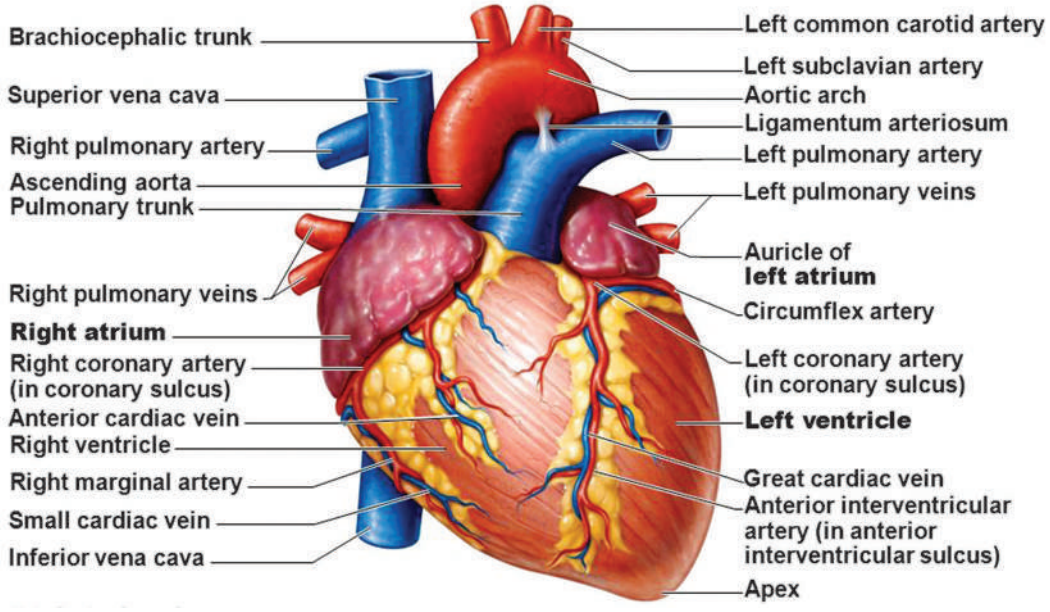


Fig. 12.2 Heart

External Features:

Heart has -four borders, three surfaces and four Chambers

1] **Borders:** 4 borders are

a) **Upper border or base:** It is formed by major part of left atrium and small part of right atrium

b) **Right border:** It is formed by right atrium

c) **Inferior border:** It is formed by right ventricle and very small part of left ventricle called as a apex of heart

d) **Left border:** It is oblique and curved and formed by maximum part of left ventricle and small part of left auricle.

2] **Surfaces:** Three surfaces of heart are-

1] **Anterior surface or sternocostal surface:** It is form by all four Chambers of heart. This surface is entirely covered by lungs but a small part of it at cardiac

4	Continues as pulmonary trunk	Continues as ascending aorta
5	Moderator band present	Moderator band absent
6	3 papillary muscles	2 papillary muscles
7	3 chordae tendinae	2 chordae tendinae

12.4 VALVULAR SYSTEM OF HEART

Heart has two types of valves

- **Atrioventricular valve**
  - a) Right atrioventricular or Tricuspid
  - b) Left atrioventricular or Bicuspid
- **Semilunar valve**
  - a) Pulmonary valve
  - b) Aortic valve

1) Atrioventricular Valve:

a. Tricuspid valve

b. Bicuspid valve

They are present between atrium and ventricle and during closure they produce 1st heart sound i.e. lub.

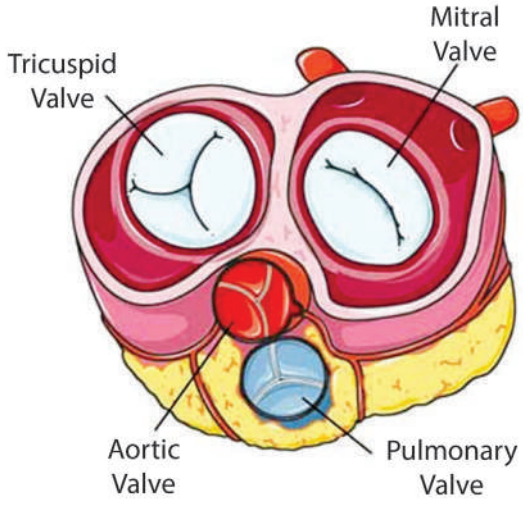


Fig. 12.4 Valvular System of Heart

Structure: Atrioventricular valve consist of 4 parts.

1] Fibrous ring
2] Cusp
3] Chordae tendinae
4] Papillary muscle.

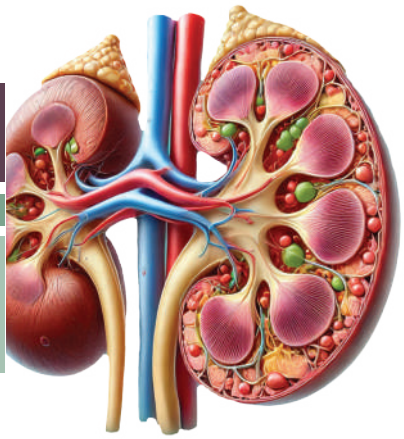
S.No.	Tricuspid Valve	Bicuspid Valve
1	Right atrioventricular	Left atrioventricular
2	Present in between right atrium and right ventricle	Present in between left atrium and left ventricle
3	3 cusps	2 cusps
4	3 chordae tendinae	2 chordae tendinae
5	Cusp are long and thin	Cusp are small & thick

CHAPTER

13

TERM 2 – (VOLUME 2 - PAPER 2)

URINARY SYSTEM



Marks –10 Questions – MCQ, SAQ, LAQ

Topics Covered

13.1 Components of Urinary System

13.2 Anatomical structure (MK), Histology (MK), Clinical Anatomy (MK) and Developmental Anomalies of (MK)

A] Kidney
B] Ureter
C] Urinary Bladder
D] Urethra

13.1 COMPONENTS OF URINARY SYSTEM

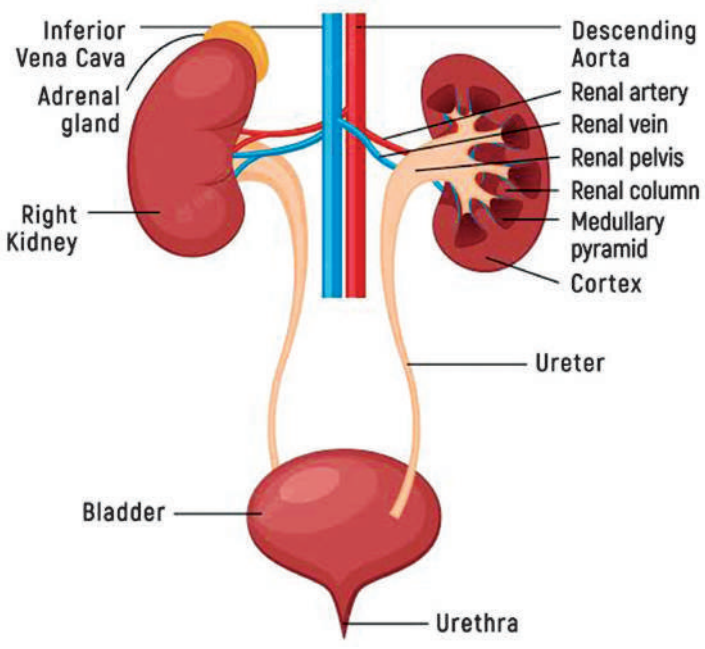


Fig. 13.1 Anatomy of the Urinary System

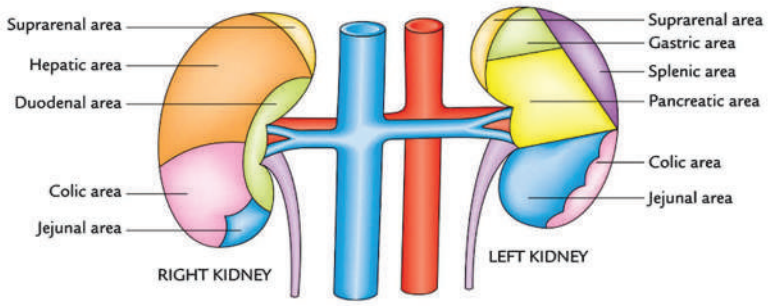


Fig. 13.2 Relations of anterior surface of kidney

Relations of Posterior Surface:

- ❑ Diaphragm
- ❑ Psoas major muscle
- ❑ Quadratus lumborum muscle
- ❑ Transverse abdominis muscle
- ❑ Subcostal artery and vein
- ❑ Subcostal nerve
- ❑ Ilio hypogastric nerve
- ❑ Ilioinguinal nerve

Structure of Kidney: Naked eye examination of kidney shows

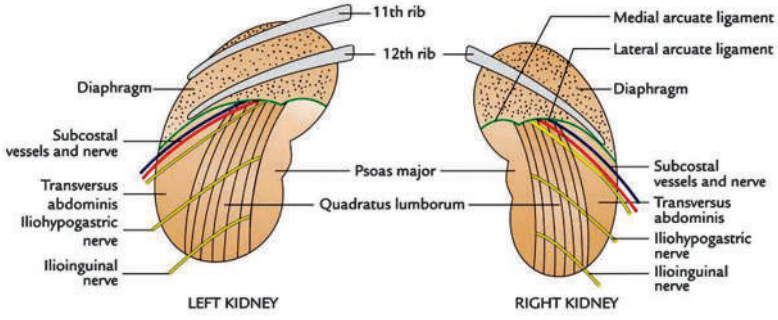


Fig. 13.3 Relations of posterior surface of kidney

1] **Outer cortex** which is divided into lobules and columns.

2] **Inner Medulla** which is made up of pyramids and papillae.

3] **Innermost sinus** which is made of minor calyx major calyx and pelvis of ureter.

Histology of Kidney:

Each kidney is composed by 1to 3 millions urineferous tubules. Each tubule has two parts–

Secreting part or ***Nephron***

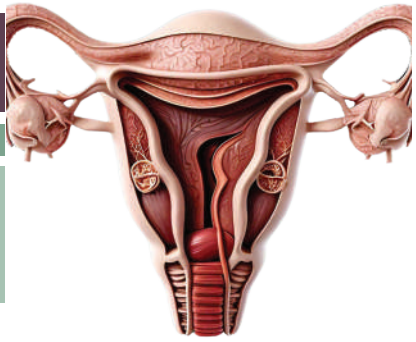
Collecting part

CHAPTER

14

TERM 3 – (VOLUME 2 - PAPER 2)

REPRODUCTIVE SYSTEM



Marks – 06

Questions – MCQ, SAQ

Topics Covered

14.1 List of the Anatomical Structures of Male Reproductive System MK

14.2 Ayurved Sharir of Male Reproductive System MK

14.3 Male Reproductive Organs- MK

Anatomical structure, histology and applied aspect of

A] Testis
B] Scrotum
C] Epididymis
D] Ductus Deference
E] Ejaculatory Duct
F] Penis
G] Spermatic Cord
H] Seminal Vesicle
I] Prostrate Gland

14.4 List of the anatomical structures of Female Reproductive System MK

14.5 Ayurved Sharir of Female Reproductive System MK

14.6 External Female Reproductive Organs MK

14.7 Internal Female Reproductive Organs- MK

Anatomical structure, histology (DK) and applied aspect of

A] Uterus
B] Fallopian Tube
C] Cervix
D] Vagina
E] Ovary

14.1 LIST OF THE ANATOMICAL STRUCTURES OF MALE REPRODUCTIVE SYSTEM

Male Reproductive System includes external genital organs and internal genital organs.

External genital organs:

1] Penis
2] Scrotum with testis

Internal genital organs:

1] Epididymis
2] Vas deference
3] Seminal Vesicles
4] Ejaculatory duct
5] Prostrate
6] Urethra

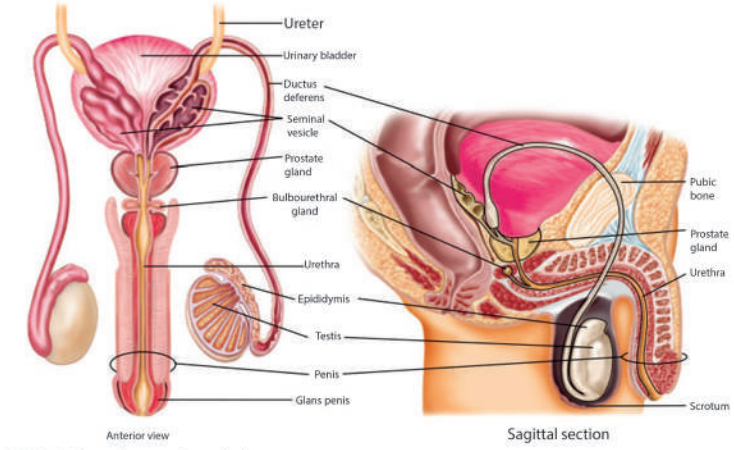


FIGURE 25-1 The male organs of reproduction.

Fig. 14.1 Male Reproductive System

14.2 AYURVED SHARIR OF MALE REPRODUCTIVE SYSTEM

There are some references related to male reproductive system in the context of Ayurveda viz.

1] वृषण:

According to Charakacharya, it is one among the pratyangas and are two in number.

Synonym: Mushka, Vrushana, Phalakosha, Andakosha and Anda

Formation:

मांसासृक्ककफ़मेद: प्रसादात् वृषणौ (Su. Sa. 4/31)

CHAPTER 14

14.4 LIST OF THE ANATOMICAL STRUCTURES OF FEMALE REPRODUCTIVE SYSTEM

Female Reproductive System includes external genital organs and internal genital organs.

External genital organs:

1] Mons Pubis
2] Labia Majora
3] Labia Minora
4] Clitoris
5] Vestibule of Vagina
6] Bulbs of the vestibule
7] Greater vestibular glands of Bartholin

Internal genital organs:

1] Uterus
2] Pair of Ovary
3] Fallopian tube
4] Vagina

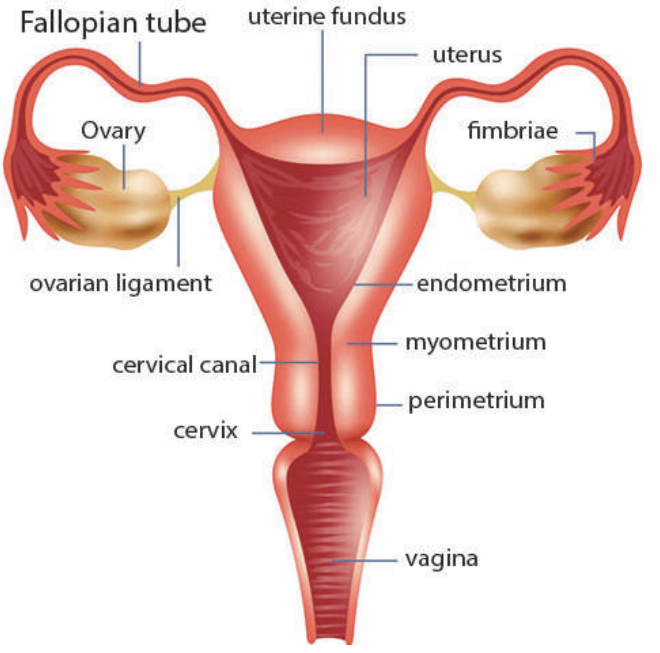


Fig. 14.9 Female Reproductive System

14.5 AYURVED SHARIR OF FEMALE REPRODUCTIVE SYSTEM

१] गर्भाशय: (Uterus)

Synonym: Dhara, Jarayu, Phalayoni

Nirukti:

"गर्भ आशेते अत्र !" अमर व्दि. मनुष्यवर्ग pg no. 276

The place where garbha resides is known as Garbhashaya.

शंखनाभ्याकृतिर्योनिस्त्यावर्ता सा प्रकीर्तिता ! तस्यास्तृतीये त्वावर्ते गर्भशय्याप्रतिष्ठिता

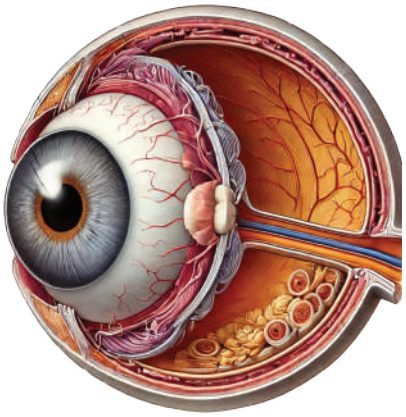
यथा रोहितमत्स्यस्य मुखं भवति रुपत: ! तत्संस्थानां तथा रुपां गर्भशय्यां विदुर्बुधा: !! (Su. Sa. 5/33,34)

It lies in the third fold of yoni. The size and shape of the garbhashaya is similar to that of the mouth of the rohita fish.

CHAPTER 15

TERM 3 – (VOLUME 2 - PAPER 2)

SENSORY ORGANS



Marks –10 Questions : MCQ, SAQ, LAQ,

Topics Covered

15.1 Sensory Receptors (MK)
15.2 Hierarchy of Development of Five Senses (MK)
15.3 Need of Five Senses (MK)
15.4 Structural aspect and Clinical Anatomy of (MK)
- A] Eye
- B] Ear
- C] Nose
- D] Tongue
- E] Skin

15.5 The Pathways of each Sense in Understanding of its Functional Anatomy (NK)
15.6 Sensory organs- Method and Tool of Examination (DK)
Importance of Sensory Organ in Systemic Examination

15.1 SENSORY RECEPTORS

Introduction: The human body can understand the world with the help of sensory system. The sensory system of body includes sensory receptors which are present in specialized organs i.e. sensory organs such as eyes, ear, nose, tongue and skin. The special sensory receptors are-

1] Receptors of Vision
2] Receptors of Hearing & Balance
3] Receptors of Smell
4] Receptors of Taste
5] Receptors of Skin

Structure:

Retina is made up of 10 layers.

1] Outer pigmented layer
2] Layer of rods and cones
3] External limiting membrane
4] Outer nuclear layer
5] Outer molecular layer
6] Inner nuclear layer
7] Inner molecular layer
8] Ganglion cell layer
9] Nerve fibre layer
10] Internal limiting membrane.

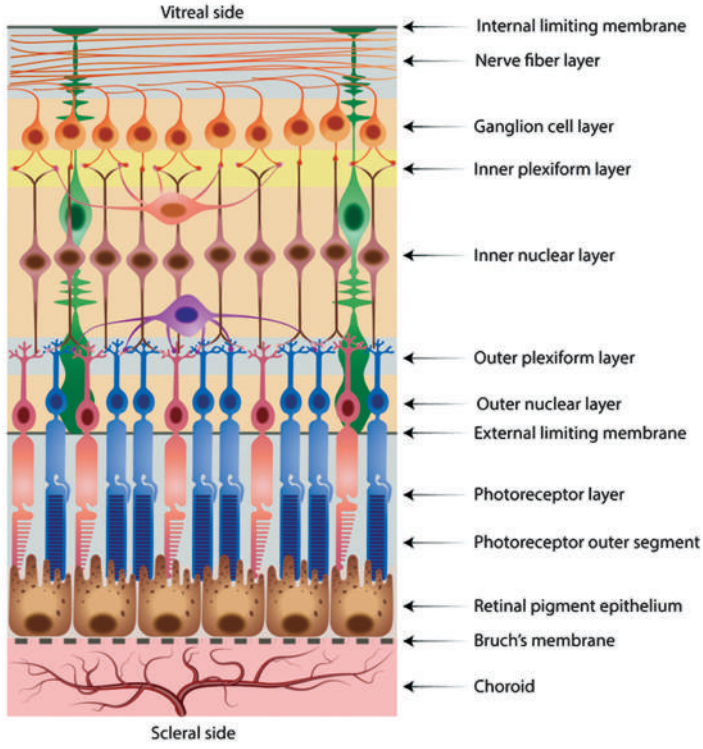


Fig. 15.2 Layers of Retina

Parts of Retina:

Retina divides into

Optic Part

Ciliary Part

Iridial Part

1] Optic Part: It contains nervous tissue & is sensitive to light.

The anterior margin of the optic part forms a wavy line called the **ora serrata.**

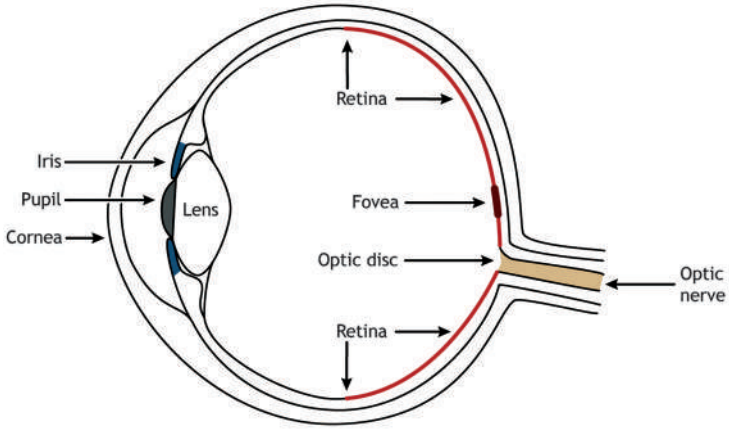


Fig. 15.3 .....

2] Ciliary part &

3] Iridial part are non nervous insensitive layer.

Peculiarities of Retina:

- Rods and cones are light receptors.
- Opposite the entrance of optic nerve there is a circular area known as the **optic disc.** (diameter-1.5mm)