



***STUDY GUIDE***

**SECOND YEAR MBBS - 2025**

**KARACHI INSTITUTE OF MEDICAL SCIENCES  
(KIMS)**

## CONTENTS

<b>Sr.</b>	<b>TOPICS</b>	<b>PAGE NUMBER</b>
1	Contact Persons	3
2	Vision & Mission of KIMS	4
3	Attendance Policy	5
4	Dress Code	6
5	Mentoring program & team	7-8
6	The Modules	9
7	Learning Methods & Assessment	10
8	Introduction to Anatomy Department	11
9	Introduction to Physiology Department	12
10	Introduction to Biochemistry Department	13
11	Introduction to Medicine Department	14
12	Introduction to Surgery Department	15
13	Introduction to Community Health Sciences Department	16
14	Introduction to Behavioral Sciences Department	17
15	Annual Curriculum	18
16	Learning Objectives- Anatomy	19-36
17	Learning Objectives-Physiology	37-50
18	Learning Objectives-Biochemistry	51-58
19	Learning Objectives-Medicine	59-60
20	Learning Objectives-Surgery	61-66
21	Learning Objectives- Community Health Sciences	67
22	Learning Objectives-Behavioral Sciences	68-76

<b>23</b>	Learning Objectives-Pakistan Studies	77
<b>24</b>	Tabulated presentation of Learning objectives with teaching methodologies and assessment tool	78

## **CONTACT PERSONS**

Director Medical Education: **Dr. Ruqqaya (Assistant Prof)**

Academic Curriculum Committee Incharge (ACC-II): **Dr Rabiya Ali (Assistant Prof)**

Anatomy Department coordinator: **Dr Asima Tabassum (Assistant Prof)**

Physiology Department Coordinator: **Dr. Rabiya Ali (Assistant Prof)**

Biochemistry Department Coordinator: **Dr. Madiha Soban (Assistant Prof)**

Medicine Department coordinator: **Dr. Arshad Ali (Professor)**

Surgery Department Coordinator: **Dr. Nida Ahmed (Senior Registrar)**

Research Methodology Coordinator: **Dr. Samira Faiz (Assistant Professor)**

Behavioral Sciences coordinator: **Lt Col Dr. Muzafar Ahmed(desgination)**

## **VISION OF KIMS**

To develop professionally competent humane doctors by imparting quality education by laying adequate emphasis on character building and discipline

## **MISSION OF KIMS**

KIMS will be a nationally recognized leader in medicine, delivering patient-centered and technologically advanced medical education, exceptional clinical and preventive care, leading to healthier communities and a strong urge for lifelong learning through research and development

## **ATTENDANCE POLICY**

### **ATTENDANCE POLICY FOR REGULAR STUDENTS:**

#### **NUMS rules for eligibility in annual examinations.**

- Minimum attendance requirement is 75% in each subject: attendance is for lectures, demos, practicals, PBLs, presentations etc.
- The attendance is not simply for lectures.
- No shortfall in attendance will be condoned in any case by any authority
- Attendance is maintained by the Department of Scholastic Records.
- All students should try and achieve 100% attendance.
- Every teaching session is essential. You must have at least 75% attendance in to be permitted to sit for the professional examination.

The University rules permit a 25% short fall for genuine reasons of personal ill health of a life-threatening nature or unavoidable circumstances such as death of a blood relative. This 25% relaxation is not so that you can take a holiday.

**If you have less than 75% attendance even for reasons of health, you will be asked to repeat the year. Maintaining adequate attendance is your personal responsibility**

### **ELIGIBILITY CRITERIA FOR APPEARING IN ANNUAL PROFESSIONAL EXAMINATIONS**

A student will be eligible to appear in the annual professional examination if he/she fulfills the following criteria:

1. 75% attendance
2. Must have cleared all financial dues
3. Must have appeared in all three end-of-module examinations
4. No breach of discipline should have occurred for which the Disciplinary Committee has advocated a punishment.

## **DRESS CODE**

### **Male students:**

1. Pants and plain tidy jeans without cut marks.
2. Casual Shirts or T-shirts (Half/ Full sleeves) without any messages, and images
3. Casual shoes or Joggers with socks
4. Shalwar Qameez

### **Female students:**

5. Shalwar Qameez
6. Hijab, Abaya, Chaddar etc
7. Shoes and Joggers
8. Dupatta/ scarf is compulsory

**Most Important: All students must wear white coat during classes, hospital rotations and otherwise as appropriate.**

## **THE MODULES**

### Organization of modular curriculum and teaching

Each Academic Year is divided into 3 Modules of 10-12 weeks duration each

- **First Year** - **Modules/Block** - **I,II,III**
- **Second Year** - **Modules/Block** - **IV,V,VI**
- **Third Year** - **Modules/Block** - **VII,VIII,IX**
- **Fourth Year** - **Modules/Block** - **X,XI,XII**
- **Final Year** - **Modules/Block** - **XIII,XIV,XV**

The Examining subjects are

- **SECOND YEAR MBBS**
  - Anatomy
  - Physiology
  - Biochemistry

The subjects that will not be examined in SECOND YEAR MBBS

Surgery and Allied  
Medicine and Allied  
Research Methodology  
Behavioural Sciences  
Pakistan Studies

A weekly schedule is placed on the notice board

## **LEARNING METHODS**

The following teaching / learning methods/strategies are used to promote better understanding:

- a) Interactive Lectures
- b) Small group discussion
- c) Lab practical
- d) Case based learning
- e) Self-directed learning (SDL) and directed self-learning (DSL)

## **ASSESSMENT**

### Internal Assessment

Formative assessment (low stake) is at faculty discretion like mid module test and other class tests. There will be three end of blocks and one pre-annual examination in year I, which contributes towards the weighting of internal assessment i.e 20% in first professional MBBS Examination.

### Annual Professional Examination.

The University will take the first professional Examination at the end of the academic year. Annual Theory & Practical Examination will be of 200 marks for Anatomy, Physiology and Biochemistry. The passing score is 50% in theory and practical separately

# **DEPARTMENT OF ANATOMY**

## **INTRODUCTION**

Anatomy (G); Ana = apart + Tome = to cut

The branch of science which is concerned with the structure of humans, animals, and other living organisms, which are revealed by separation of the parts of body (Dissection). Understanding anatomy is the key to the practice of medicine and surgery.

## **FACULTY**

- Professor
  - Prof. Dr. Ghulam Mujtaba Kolachi (HoD)
- Associate Professor
  - Dr. Iffat Raza
  - Dr. Nausheen Adnan
- Assistant Professor
  - Dr. Asima Tabassum
- Senior Lecturer
  - Dr. Naheed Akhtar
  - Dr Marvi Zaur
- Lecturer
  - Maj. (R) Dr. Syed Mansoor Ahmad
  - Dr. Sana Yaseen
  - Dr. Sana Khan

## **RECOMMENDED STUDY MATERIAL**

- Gross Anatomy:
  - Keith L. Moore
  - Richard S. Snell
  - Gray's Anatomy
- Histology:
  - Liaq Hussain
- Embryology:
  - Langman's medical embryology
  - Embryology by Kieth L. moore
- General Anatomy
  - BD Chaurasia
- Neuroanatomy
  - Richard S Snell

## **DEPARTMENT OF PHYSIOLOGY**

Physiology is referred to “**mother of medicine**” and “the science of life”, looks at living mechanisms from molecular basis of cell function to the whole integrated behavior of the entire body. Physiology aims to understand the fascinating mechanisms of the human body. Human physiology studies how cells, muscles and organs work together, how they interact.

### **FACULTY**

- Professor
  - Prof. Dr. Muhammad Adnan Kanpurwala (HoD)
- Associate Professor
  - Brig (R) Dr. Abdul Qadir
  - Lt.Col. Dr. Yasir Farooq
- Assistant Professor
  - Dr. Rabiya Ali
- Senior Lecturer
  - Dr. Naila Aneel
  - Maj. (R) Dr. Muhammad Amjad
- Lecturer
  - Dr. Samira Amjad
  - Dr. Faiza

### **RECOMMENDED STUDY MATERIAL**

- Guyton & Hall
- Lauralee Sherwood
- Ganong
- Costanzo
- Tortorra

## **DEPARTMENT OF BIOCHEMISTRY**

Biochemistry is a dynamic, exciting science in which chemistry is applied to the study of the atoms and molecules that comprise living organisms, including organic molecules and their chemical reactions. It has revolutionized our understanding of and provides a backbone to modern medicine.

### **FACULTY**

- Professor
  - Prof. Dr. Shaheena Hakro (HoD)
- Associate Professor
  - Dr. Fasiha Fatima
- Assistant Professor
  - Dr. Madiha Soban
- Senior Lecturer
  - Dr. Razeen Fahad
- Lecturer
  - Dr. Aneela Muzaffar
  - Dr. Ayeha

### **RECOMMENDED STUDY MATERIAL**

- Harper's Illustrated Biochemistry by Murray RK, Granner DK and Rodwell VW, latest edition, McGraw Hill
- Lippincott's Illustrated Reviews: Biochemistry by Harvey R and Ferrier D, Latest edition, published by Lippincott Williams & Wilkins
- Marks' Basic Medical Biochemistry — A Clinical Approach, by Smith C, Marks AD, and Lieberman M. Latest edition, published by Lippincott Williams & Wilkins
- Lehninger Principles of Biochemistry by David L Nelson and Michael M. Cox
- Tietz Textbook of Clinical Chemistry by Burtis CA and Ashwood ER published by Saunders

## **DEPARTMENT OF MEDICINE**

Medicine is the science and practice of caring for a patient, including diagnosing, prognosis, prevention, treatment, palliation, and encouraging their health. Medicine is a broad term that refers to a multitude of health-care methods that have emerged to preserve and restore health through illness prevention and treatment.

### **FACULTY**

- Professor
  - Prof. Dr. Arshad Ali (HoD)
- Registrar
  - Dr. Omar Tariq Khan

### **RECOMMENDED STUDY MATERIAL**

- Davidson Principles & Practice of Medicine
- Hutchison's Clinical Methods
- Kumar & Clark's Clinical Medicine
- Macleod's Clinical Examination

## **DEPARTMENT OF SURGERY**

General surgery is the branch of medical science that treats injuries, diseases, and deformities by physically removal, repair, or readjustment of organs and tissues; often involving cutting into the body. It is frequently performed to alleviate suffering when this is unlikely through medication alone. The operative procedures may range from minor out –patient procedures; to more complicated operations in admitted patients under supervision of a skilled surgical team.

It consists of numerous sub-specialties including:

- Orthopedics.
- Urology.
- Pediatric surgery.
- Neurosurgery.
- Vascular surgery.
- Cardio-thoracic surgery.

### **FACULTY**

- Professor:
  - Prof. Dr. Arshad Malik (HOD Academics)
  - Brig Dr. Shoaib Hanif
  - Col Dr. Asim Ishfaq (Neurosurgery)
  
- Assistant Professor:
  - Col Dr. Qamar Zia (Urology)
  - Col. Dr. Younis
  - Lt. Col. Dr. Iftikhar
  - Lt. Col. Dr. Jawed (Orthopedics)
  
- Senior Registrar:
  - Dr. Nida Ahmed
  - Maj. Dr. Saima
  
- Registrar:
  - Dr. Sara Fatima

### **RECOMMENDED STUDY MATERIAL**

- Bailey & Love's Short practice of surgery
- Browse's Introduction to the symptoms & signs of surgical disease
- Apley's Concise System of orthopedics & Fractures

## **DEPARTMENT OF COMMUNITY HEALTH SCIENCES**

Community medicine is a system of delivery of comprehensive health care to the people by a health team in order to improve the health of community. It deals with the science and art of preventing diseases, prolonging life and promoting physical and mental health and efficiency. It is achieved through education, research, outreach and practice using an innovative model that addresses complex trans-disciplinary health issues by integrating core areas of public health and the health sciences.

### **FACULTY**

- Professor
  - Dr. Seema N. Mumtaz (HoD)
- Associate Professor.
  - Dr. Farhan M. Qureshi
- Assistant Professor.
  - Dr. Samira Faiz
  - Dr. Sehrish Zehra
  - Col. Dr. Saba Rizwan
- Senior Lecturer
  - Dr. Fatima Aiman

### **RECOMMENDED STUDY MATERIAL**

- Text Book of Public Health and Community Medicine by Mohammad Ilyas
- Park's Text book of Preventive and social Medicine

## DEPARTMENT OF BEHAVIORAL SCIENCES

Multiple interacting factors such as biological, psychological, sociocultural, economic, and behavioral factors influence human health and disease. Behavioral and social sciences contributed to research based knowledge that reports the physician's approaches to prevention, diagnosis, and patient care.

### FACULTY

- Assistant Professor Psychiatry and Behavioural sciences
- Lt col Dr Muzafar Ahmed (FCPS psychiatry)

## **ANNUAL CURRICULUM (34 WEEKS)**

### **BLOCK 04: (12+1 WEEKS)**

1. Digestive System
2. Genitourinary System

**End of block Exam: 01 weeks**

### **BLOCK 05: (8+1 WEEKS)**

1. Neuroscience and genetics

**End of block Exam: 01 weeks**

### **BLOCK 06: (11+1 WEEKS)**

1. Maxillofacial and Special senses
2. Endocrinology

**End of block Exam :01 weeks**

**LEARNING OBJECTIVES**  
**MBBS YEAR II INTEGRATED BLOCK IV**  
**MODULE VIII**  
**Digestive system and Metabolism – I**  
**Duration : 05 weeks**

**Foundation of GIT System**

Anatomy

1. Identify nine regions of abdominal cavity to locate the topographic arrangement of underlying abdominal organ.
2. Explain the clinical importance of membranous layer of superficial fascia with anatomical reasoning.
3. Describe the attachments, & nerve supply and actions of muscles of anterolateral abdominal wall.
4. Describe the formation of rectus sheath at different levels of abdomen and enlist its contents.
5. Describe the blood supply, nerve supply & lymphatic drainage of anterolateral abdominal wall.
6. Describe various types of abdominal hernias.
7. Describe the extent and enlist the structures forming various walls of inguinal canal.
8. Analyze the functions & mechanics of inguinal canal
9. List the structures passing through the inguinal canal in males and females.
10. Differentiate between direct & indirect inguinal hernia with regards to their relation with age, predisposing factor, frequency, coverings on exit from abdominal cavity, course, & exit from anterior abdominal wall.
11. Describe extent, coverings & contents of spermatic cord.
12. Describe Peritoneum and its modifications.
13. Enumerate intraperitoneal, extraperitoneal & secondarily retroperitoneal organs.
14. Define following with one example each: Mesentery, Omentum, Ligaments, Folds, Recesses, Pouches, Gutters
15. Explain peritoneal infection, adhesions & anatomical basis of spread of pathological fluid in various peritoneal compartments along with their surgical approach.

Physiology

Biochemistry

**CLINICAL CORRELATES**

Justify an inguinoscrotal swelling on the basis of anatomical knowledge of anterior abdominal wall

## Oral cavity & Esophagus

### Anatomy

1. Outline the salient anatomical features of oral cavity and its contents
2. Describe abdominal esophagus regarding its relations, blood supply, nerve supply and lymphatic drainage Describe the general plan of histological structure of GIT
3. Describe the histological structure of Esophagus
4. List derivatives of foregut
5. Describe the development of esophagus
6. Explain the embryological basis of the trachea-esophageal fistula, esophageal atresia and hiatal hernia

### Physiology

### Biochemistry

#### CLINICAL CORRELATES:

1. Relate the hypo and hyper secretions of salivary glands with its physiological and biochemical basis
2. Discuss disorders of swallowing (dysphagia, achalasia), esophageal disorders (e.g., GERD, esophagitis, Barrett's esophagus) and their clinical presentations
3. Describe the anatomical basis of bleeding esophageal varices

## Stomach

### Anatomy

1. Describe the gross anatomy, blood supply, nerve supply and lymphatic drainage of the stomach.
2. Demonstrate the position & gross features of stomach on the given model and identify the omenta attached.
3. Enumerate the structures lying in stomach bed.
4. Describe the development of stomach with special reference to its rotations and relocation of both vagi
5. Enlist derivatives of ventral and dorsal mesentery of foregut.
6. Explain the formation of lesser sac
7. Explain the histological structure of stomach
8. Differentiate between a gastric gland and pit
9. Enumerate cells forming gastric glands
10. Describe the structure and function of cells forming gastric glands
11. Compare the histological structure of cardia, fundus and pylorus of stomach

### Physiology

### Biochemistry

#### CLINICAL CORRELATES:

1. Correlate a case of gastritis with pernicious anemia with histological and biochemical basis
2. Explain the embryological basis of pyloric stenosis
3. Describe the mechanism of development of gastric ulcers and erosions
4. Describe the gastric functions tests
5. Explain gastric and peptic ulcers with reference to their common locations and blood vessels endangered as a consequence of perforation
6. Identify common stomach disorders such as gastritis, Helicobacter pylori infection, achlorhydria, peptic ulcer and gastric cancer

## Small intestine

### Anatomy

1. Describe the gross anatomical features of small intestine
2. Describe the histological structure of three parts of small intestine
3. Differentiate between three parts of small intestine on histological basis
4. Elaborate the adaptive structural modifications of small intestine for performing its functions
5. Describe physiological herniation with emphasis upon rationale behind its occurrence and reduction.
6. Correlate the rotation of midgut loop with definitive positioning of mid gut derivatives in abdomen
7. Describe the development of Duodenum

### Physiology

### Biochemistry

### CLINICAL CORRELATES:

1. Identify common disorders of the small intestine, such as celiac disease, and small intestinal bacterial overgrowth (SIBO), Sprue
2. Correlate development of midgut with abnormalities of mesenteries, vitelline duct abnormalities, gut rotation defects, gut atresia & stenosis
3. Differentiate between omphalocele, umbilical hernia and gastroschisis on the basis of embryology Explain the nutritional requirements in Pregnancy, cirrhosis, end stage renal disease
4. Compare and contrast between Marasmus and Kwashiorkor

## Large Intestine

### Anatomy

1. Describe the histological, and gross anatomical features of large intestine and appendix
2. Describe the partitioning of cloaca and its consequences
3. Describe the histological, and gross anatomical features of large intestine and appendix
4. Describe the partitioning of cloaca and its consequences

### Physiology

### Biochemistry

#### CLINICAL CORRELATES:

1. Identify common disorders of large intestine, such as Crohn's disease, IBS, pain lower abdomen, appendicitis, haemorrhoids/ anal fissure and intestinal obstruction
2. Describe the embryological basis of hindgut abnormalities (Recto anal atresia, anal fistulas, imperforate anus and congenital mega colon)
3. Describe the common types, pathophysiology and presentations of diarrhea and constipation

## Liver & Biliary Tree

### Anatomy

1. Identify and describe the histological, embryological liver and gallbladder
2. Describe the gross anatomical features of liver and gallbladder,
3. Describe the liver and gall bladder structure, blood & nerve supply, lymphatic drainage, bile ducts, and relationship with the liver.
4. Describe the peritoneal covering, ligaments and supports of liver
5. Describe location, relations, supports, blood supply, nerve supply & lymphatic drainage of spleen

### Physiology

### Biochemistry

#### CLINICAL CORRELATES:

1. Identify common disorders of the liver and gallbladder, such as fatty liver, cirrhosis, portal hypertension, cholelithiasis and cholecystitis.
2. Describe the types of jaundice and their presentations • Interpret LFTs
3. Describe the embryological basis of accessory hepatic duct, duplication of Gall bladder, extrahepatic biliary atresia, intrahepatic biliary duct atresia and hypoplasia
4. Describe the anatomical basis of referred pain in cholecystitis/ Cholelithiasis
5. Justify the possibility of splenic rupture in case of accidental injury
6. Describe the common causes of splenomegaly

## Pancreas

### Anatomy:

1. Describe the location, parts, relations and ducts of pancreas
2. Describe the blood supply, nerve supply and lymphatic drainage of pancreas
3. Describe the light microscopic picture of pancreas
4. Explain the development of pancreas

### Physiology

### Biochemistry

#### CLINICAL CORRELATES:

1. Identify common disorders of the pancreas, such as CA head of Pancreas, malabsorption syndrome, acute and chronic pancreatitis and Zollinger-Ellison syndrome
2. Justify the referred pain of acute pancreatitis with anatomical reasoning
3. Explain the embryological basis of Annular pancreas and accessory pancreatic tissue
4. Explain Hyperglycemia, hypoglycemia and their regulating factors

## **PRACTICALS :**

### **Anatomy**

Identify and illustrate the microscopic structure of following:

1. Esophagus and Stomach
2. Cardiac end of stomach
3. Small Intestine
4. Colon and Appendix
5. Liver
6. Gall bladder and Pancreas
7. Anal canal

## **THEME BASED LEARNING**

1. Swelling in groin/inguinal hernia
2. Dysphagia/ Achlasia
3. Nausea & Vomiting / Pain epigastrium/ Peptic Ulcer
4. Diarrhea/ Constipation/ Abdominal distention
5. Jaundice/ Cirrhosis
6. Malnutrition

**MBBS YEAR II BLOCK IV**  
**INTEGRATED MODULE IX**  
**Genitourinary System Module**  
**Duration : 07 weeks**

**Fluid & Electrolyte Balance**

Anatomy

1. List the groups of lymph nodes draining the abdomen.
2. Describe the terminal group of lymph nodes around abdominal aorta

Physiology

Biochemistry

**CLINICAL CORRELATES**

1. Relate the pathophysiological basis of water balance in the body with its clinical implications (dehydration, hyper & hyponatremia, vomiting, circulatory shock and SIADH)
2. Explain the role of Starling forces in the development/ prevention of edema
3. Appreciate the significance of edema safety factor
4. Discuss the mechanism of fluid accumulation in the potential spaces
5. Compare and contrast the intracellular and extracellular edema

**KIDNEY**

Anatomy:

1. Describe the gross features, coverings, surface marking, blood supply, nerve supply, & lymphatic drainage of kidney
2. Draw and label the relations of anterior and posterior surfaces of both kidneys
3. Describe location, gross features, relations, blood supply, nerve supply, & lymphatic drainage of suprarenal glands
4. Describe the development of kidney with reference to the sources of different parts of uriniferous tubule, rotation and ascent of kidneys
5. Describe the histological features of kidney and uriniferous tubules
6. Identify the histological features of kidney on a slide under microscope
7. Explain the histological features of juxta glomerular apparatus
8. Describe the histological structure of glomerular filtration barrier
9. Differentiate between microscopic features of PCT and DCT

Physiology

## Biochemistry

### **CLINICAL CORRELATES:**

1. Correlate following congenital anomalies with normal development: Wilm's tumour, Horseshoe kidney, Ectopic/Accessory kidney, Poly cystic kidneys, Malrotated kidney, Agenesis of kidney
2. Explain surgical significance of renal fascia and separate compartment for suprarenal gland  
Describe the possible routes of spread of perinephric abscess
3. Explain the anatomical basis of typical renal colic
4. Discuss disorders of urine concentrating ability (diabetes insipidus: central and nephrogenic, SIADH)
5. Quantify renal urine concentration and dilution: "Free Water" and osmolar clearances
6. Identify and explain hazardous effects of sodium and potassium with clinical features.
7. Identify common electrolyte abnormalities with clinical case presentation.
8. Correlate RFTs with clinical presentation (Oliguria/ Uraemia/ Renal Failure)
9. Discuss the pathophysiology of Nephrotic Syndrome
10. Describe the principles of Dialysis(Artificial kidney, Hemodialysis and peritoneal dialysis)

## **ACID BASE BALANCE**

### Physiology

### Biochemistry

### Clinical Correlates:

1. Correlate the presentation of different acid base disorders with their etiology
2. Interpret person's acid base status through ABGs analysis
3. Describe anion gap and its clinical significance

## **Ureter & Urinary Bladder**

### Anatomy

1. Describe the gross features, relations, & course of both ureters on the model / specimen while emphasizing upon its constrictions.
2. Describe the blood and nerve supply of ureter.
3. Explain the anatomical basis of ureteric stone impaction
4. Describe the light microscopic structure of ureter (upper and lower parts) and Urinary bladder
5. Describe the gross features, peritoneal covering, blood supply nerve supply and lymphatic drainage of urinary bladder
6. Identify the anatomical routes of possible spread of bladder cancer
7. Differentiate between the relations of urinary bladder in models of both genders.
8. Enumerate different parts and derivatives of urogenital sinus
9. Enlist the sources of ureter, urinary bladder and urethra
10. Describe the development of urinary bladder

11. Explain the anatomical relationship of ductus deferens with ureter with embryological reasoning
12. Identify the histological features of Ureter and Urinary bladder under microscope

Physiology

Biochemistry

**CLINICAL CORRELATES:**

1. Justify referred pain of ureteric colic with anatomical reasoning
2. Correlate various Urachal anomalies, exstrophy of bladder and exstrophy of cloaca with normal development
3. Identify common abnormalities of micturition such as atonic, automatic and neurogenic bladder

**POSTERIOR ABDOMINAL WALL**

Anatomy

1. Describe the fascia of posterior abdominal wall
2. Distinguish lumbar vertebrae from cervical & thoracic vertebrae
3. Describe anatomical features of a typical lumbar vertebra
4. Explain the origin, insertion, nerve supply and actions of muscles of posterior abdominal wall
5. Describe the fascial lining of the abdominal walls
6. Analyze the anatomical basis of a case of psoas abscess and its spread
7. Describe the extent, relations, and branches of abdominal aorta along with their distribution.
8. Explain formation, & tributaries of inferior vena cava
9. Identify the abdominal relations of inferior vena cava in the given model.
10. Describe formation, branches and distribution of lumbar plexus.
11. Describe the course, associated ganglia and branches of sympathetic trunk

**PELVIS & PERINEUM**

Anatomy

1. Describe the boundaries of true and false pelvis.
2. Explain the bony landmarks & sites of muscular attachments on sacrum
3. Describe the type, articulations, ligaments & movements of joints of pelvis.
4. Enumerate the structures forming pelvic diaphragm.
5. Describe the origin, insertion, nerve supply & actions of muscles of pelvic walls & floor
6. Explain the functional significance of pelvic floor in females
7. Demonstrate the orientation of pelvic girdle.
8. Demonstrate the features of bony pelvis in the given model
9. Demonstrate boundaries of pelvic inlet and pelvic outlet

**CLINICAL CORRELATES:**

1. Correlate the autonomic nervous control of pelvic viscera with various clinical conditions

2. Justify occurrence of low back pain in sacroiliac joint disease
3. Analyze the clinical presentation of a case of injury to pelvic floor with anatomical reasoning

## **SIGMOID COLON/RECTUM**

1. Describe the gross anatomy of sigmoid colon and rectum
2. List the structures palpated in males and females while performing rectal examination

## **URINARY BLADDER**

1. Differentiate between the relations of urinary bladder in models of both genders.
2. Identify the site commonly selected for suprapubic aspiration of urine

## **MALE AND FEMALE REPRODUCTIVE SYSTEM**

### **Anatomy**

1. Discuss clinical importance of vasectomy
2. Explain the gross anatomy of prostate, ovaries and fallopian tubes, uterus Illustrate sacral plexus showing its branches
3. List the branches of internal iliac artery
4. Enumerate different groups of lymph nodes of pelvis.
5. Explain the indifferent stage of gonad development, development and descent of testis.
6. Describe the embryological basis of cryptorchidism
7. Explain the development of ovaries
8. Enumerate the derivatives of mesonephric duct, paramesonephric duct and urogenital sinus in males and females.
9. Describe the indifferent stage of genital ducts and development of genital ducts in the male and female.
10. Describe the indifferent stage of external genitalia and development of external genitalia in the male and female.
11. List common anomalies of the male genitalia.
12. Describe the embryological basis of hypospadias and epispadias.
13. Identify parts of developing genitourinary system on given models and diagrams showing different developmental phenomena
14. Describe the histological features of testes and correlate the blood-testes barrier with its functions.
15. Explain the light microscopic features of male genital ducts, accessory glands of the male reproductive system
16. Differentiate and illustrate the light microscopic structure of male reproductive system; Testis, Epididymis Vas deferens, Seminal vesicle, Prostate
17. Describe the light microscopic features of following female reproductive organs; Ovaries, Fallopian tubes, Uterus, Cervix, Vagina

18. Differentiate and illustrate following components of female reproductive system; Ovaries, Fallopian tubes, Uterus, Cervix, Vagina

#### **CLINICAL CORRELATE:**

1. Apply the knowledge of histology to explain the clinical scenarios of Immotile cilia syndrome, benign prostatic hypertrophy and carcinoma of prostate
2. Apply the knowledge of embryology to explain the following congenital anomalies: o Uterus didelphys o Uterus arcuatus o Uterus bicornis. o Vaginal atresia
3. Apply the knowledge of embryology to explain the basis and clinical presentation of following disorders of sexual development: o Ambiguous genitalia Hermaphrodites o Congenital adrenal hyperplasia. Gonadal dysgenesis

## **PERINEUM**

#### **Anatomy:**

1. Describe the borders, relations & divisions of perineum
2. Explain the boundaries of superficial and deep perineal pouches and enumerate their contents in both genders
3. Illustrate the cutaneous nerves of the perineum.
4. Describe perineal body with its attachments
5. Describe the relations, internal features, blood supply, lymphatic drainage, & innervation of anal canal Describe the boundaries, contents & recesses of ischiorectal fossa
6. Describe the gross features of vagina including relations, blood supply, nerve supply & supports
7. Explain gross features of all parts of male & female urethra, its arterial supply, venous drainage & nerve supply
8. Apply anatomical reasoning in justifying the route of extravasation of urine in case of injury to different parts of male urethra
9. Enlist parts of external genitalia and describe their blood and nerve supply
10. Identify the various organs, impressions, ligaments, nerves, muscles, blood vessels related to renal system, pelvis and perineum on given models and specimens.
11. Differentiate b/w anatomical features of male & female pelvis in the given model

#### **CLINICAL CORRELATES:**

1. Differentiate between clinical presentation of internal and external hemorrhoids on anatomical basis
2. Elucidate perianal hematoma, fissure, abscess and fistulas of anal canal with anatomical basis of their occurrence and presentation
3. Justify the possible routes of spread of ischiorectal abscess with anatomical reasoning
4. Explain area of anesthesia, indications, & list steps of pudendal nerve block
5. Provide the anatomical basis of presentation of Bartholin cyst

6. Apply the anatomical knowledge in analyzing a case of vaginal prolapse (cystocele and rectocele, and vaginal fistula)
7. Define culdocentesis and describe its diagnostic and therapeutic importance
8. Identify the parts of prostate most likely to be involved in benign and malignant growths of prostate. Justify the metastasis of carcinoma of prostate to vertebral column & cranial cavity on basis of venous drainage
9. Correlate the anatomy of female genital tract with hysterosalpingography, ligation of uterine tubes, ectopic tubal pregnancy
10. Comprehend a case of uterine prolapse on the basis of gross anatomy of uterus and its supports
11. Define hysterectomy and explain the precautionary measures to be taken necessarily during this procedure
12. Identify the anatomical routes for spread of malignancies of uterus, cervix and ovary
13. Explain the role of lymphatics and lymph nodes in spread of malignancies of pelvis

## **SURFACE MARKING**

Kidneys, Suprarenal glands, Ureter, Abdominal aorta, Inferior vena cava

## **PRACTICAL :**

### **Anatomy**

Identify and illustrate the microscopic structure of following:

1. Kidney
2. Ureter
3. Ovary
4. Fallopian tube
5. Uterus
6. Testis
7. Prostate
8. Vas deferens
9. Epididymis

## **THEME BASED LEARNING**

1. Edema/ Dehydration
2. Pain in right flank
3. Polyuria
4. Oliguria
5. Acid base disorders
6. Uterine prolapse
7. Hemorrhoids

**MBBS YEAR II**  
**BLOCK V INTEGRATED MODULE X**  
**Neurosciences I & Genetics**  
**Duration: 08 weeks**

**Foundations of Neurosciences**

Anatomy:

1. List the major divisions, components of the central nervous system.
2. Summarize the histological features of neuron and neuroglia.
3. Classify neurons according to their morphology with one example of each.
4. Explain the histomorphological composition of peripheral nerve.
5. Differentiate between sensory and autonomic ganglia in tabulated form.
6. Describe the development of neural tube with reference to neurulation, vesicles, brain flexures and ventricles.
7. Demonstrate the structure of brain and spinal cord on prosected specimens and models.
8. Identify the normal structure of brain and spinal cord in the images of CT scan & MRI

Physiology

Biochemistry

**CLINICAL CORRELATES:**

1. Analyze the pathophysiology of demyelinating disorders like Multiple sclerosis.
2. Differentiate between tetanization, tetany, tetanus and treppe
3. Enumerate ventricles and coverings of brain and spinal cord with special emphasis on intracranial hemorrhages.
4. Justify the importance of nucleotides, their derivatives, and nucleic acids in diagnosing and treating genetic disorders, cancers, and developing anti-viral drugs and advanced gene therapy.
5. Justify and correlate the role of different neurotransmitters in various Neurological & Immunological disorders

**CRANIAL CAVITY**

Anatomy:

1. Describe the development of skull
2. Describe the importance of the fontanelle of the skull in new born regarding: - Changes in intracranial pressure. - Closure of different fontanelle

3. Explain the embryological basis of cranioschisis and various types of craniosynostosis
4. Demonstrate the anatomical position of skull with special emphasis on planes of anatomical position. Describe and demonstrate the boundaries and gross features of cranial fossae.
5. List and demonstrate foramina along with structures passing through them in anterior, middle and posterior cranial fossae.
6. Recognize and demonstrate the important sutures, fontanelle and impressions on the interior of cranial vault

Physiology

**CLINICAL CORRELATES:**

1. Correlate the congenital anomalies of skull with their embryological basis
2. Identify Important landmarks on Skull
3. Explain the clinical presentations relevant to fracture of various bones of skull

## **Meninges and Dural Venous Sinuses**

Anatomy:

1. Explain the meninges of brain and spinal cord along with the reflections of dura mater in brain.
2. Enlist paired and unpaired Dural venous sinuses along with their attachments
3. Describe the location, important relations, and communications of the cavernous sinus and enumerate structures passing through it.

Physiology

**CLINICAL CORRELATES** Describe the clinical presentation of following clinical disorders associated with meninges and Dural venous sinuses:

- Meningitis
- Epidural hemorrhage
- Subdural hemorrhage
- Subarachnoid hemorrhage

## **Spinal Cord & Neural Pathways**

Anatomy:

1. Describe the histological features of the white and grey matter of spinal cord.
2. Describe the development and positional changes of spinal cord.
3. Describe the formation and developmental changes in alar and basal plates.
4. Explain the gross appearance and the nerve cell groups in the anterior, posterior, and lateral gray columns of the spinal cord
5. Enumerate and illustrate the arrangements of ascending and descending tracts (white matter) in spinal cord at various levels.  
Explain the given clinical conditions related to ascending and descending tracts of spinal cord.

Physiology

## **CLINICAL CORRELATES**

1. Explain the embryological basis of various types of Spina Bifida.
2. Describe the clinical abnormalities of pain and other somatic sensations
3. Determine the anatomical and pathophysiological relevance of the following clinical conditions:
  - Upper motor neuron lesions, lower motor neuron lesions
  - Hemiplegia, paraplegia and Quadriplegia
  - Spinal shock syndrome
  - Complete cord transection syndrome
  - Anterior cord syndrome.
  - Central cord syndrome
  - Brown sequard syndrome
  - Syringomyelia
  - Poliomyelitis
  - Multiple sclerosis
  - Amyotrophic lateral sclerosis

## **Brainstem**

### Anatomy:

1. Enumerate the derivatives of rhombencephalon and mesencephalon
2. Summarize the characteristic developmental events of the following: - Medulla oblongata - Midbrain - Pons
3. Describe the gross appearance and internal structure of the medulla oblongata.
4. Illustrate the cross sections of medulla oblongata at different levels.
5. Explain the effects of raised pressure in the posterior cranial fossa on the structures contained within it.
6. Describe the gross features and internal structure of pons.
7. Illustrate cross-section of pons at different levels showing major structures at each level.
8. Describe the gross appearance and internal structure of the midbrain.
9. Illustrate cross sections at the level of superior colliculus and inferior colliculus showing major structures at each level

### Physiology

## **CLINICAL CORRELATES:**

1. Explain the anatomical features with relevant physiological significance of the following clinical conditions: Arnold-chiari malformation - Medial medullary syndrome - lateral medullary syndrome of Wallenberg.
2. Analyze the anatomical basis/relevance of clinical presentation in case of tumors of pons, Pontine hemorrhage and Infarction of pons.
3. Describe trauma and vascular lesions of the midbrain

4. Justify the clinical presentation of blockage of the cerebral aqueduct with anatomical and physiological basis.

## **CEREBELLUM**

### Anatomy:

1. Enumerate and illustrate histological layers of cerebellar cortices and different cell types of these layers. Summarize the characteristic developmental events of Cerebellum
2. Describe the gross features of cerebellum.
3. List intracerebellar nuclei and types of fibers constituting white matter of cerebellum and explain their routes of entry and exit.
4. Explain the pathways carrying afferent and efferent fibers to and from the cerebellum.

### Physiology

### **CLINICAL CORRELATES:**

1. Describe the pathophysiological basis of the clinical abnormalities of the cerebellum
2. Correlate the clinical presentations of cerebellar disorders with anatomical and physiological basis

## **Cerebrum**

### Anatomy:

1. Explain the histological features of cerebral cortex
2. Summarize the characteristic developmental events of Cerebrum
3. Describe the topographic anatomy of the diencephalon and demonstrate its gross features on a given model.
4. Identify main sulci and gyri of cerebral hemispheres and describe the extent of each of them.
5. Explain the divisions of cerebral lobes on superolateral, medial, and inferior surfaces of cerebral hemispheres.
6. Enumerate fibers making up the white matter of cerebral hemispheres and describe each of them Identify different components of cerebrum on prosected specimen
7. Describe the cortical functional areas in different lobes of cerebral hemispheres.

### Physiology

### **CLINICAL CORRELATES:**

1. Differentiate between Grand mal, petit mal epilepsy, and focal epilepsy
2. Correlate the clinical presentations of lesions of internal capsule and motor cortex with motor and speech disorders

3. Explain the pathophysiological disorders related to speech.
4. Explain the pathophysiology, signs, symptoms, microscopic changes, diagnosis, and treatment of Alzheimer's disease
5. Assess higher mental functions on SP

## **Diencephalon**

Anatomy:

1. Describe the general arrangement, functions and projections of reticular formation.
2. Illustrate components of limbic system on model
3. Describe the development of Diencephalon
4. Enlist the divisions, nuclei and connections of thalamus.
5. Enlist the nuclei of hypothalamus.
6. Describe the hypothalamohypophyial portal system and tract

Physiology

### **CLINICAL CORRELATES:**

1. Describe the pathophysiology and clinical presentation of various disorders of thalamus, hypothalamus and limbic system
2. Interpret the various abnormalities of body temperature regulation with special focus on fever.
3. Discuss pathophysiology of various sleep disorders
4. Explain the effects of destruction of amygdaloid complex on behavior and memory
5. Compare various types of amnesia including retrograde, anterograde amnesia, Alzheimer's and dementia.

## **BASAL NUCLEI**

Anatomy:

1. Describe connections and functions of different nuclei constituting basal ganglia

Physiology

### **CLINICAL CORRELATES:**

2. List hyperkinetic disorders related with various basal nuclei like chorea, hemiballismus and athetosis,
3. Describe Parkinson disease regarding etiology, pathophysiology, clinical features and treatment

## **Ventricular System**

Anatomy:

1. Describe the anatomical organization of ventricular system of brain

2. Explain the boundaries of each ventricle along with their choroid plexus.
3. Explain formation, circulation and absorption of CSF.
4. Enlist the structures forming blood brain and blood CSF barriers
5. Identify the features of various ventricles on models and prosected specimen. •
6. Illustrate the floor of fourth ventricle

Physiology

**CLINICAL CORRELATE:**

1. Describe the process of lumbar puncture, including sequential enumeration of the anatomical structures that a needle passes through during a spinal tap. •
2. Explain causes & varieties of Hydrocephalus

**Blood Supply of the Brain and Spinal Cord**

Anatomy:

1. Describe the blood supply of different parts of brain and spinal cord emphasizing on circle of Willis
2. Explain the formation and importance of venous system
3. Identify various blood vessels of brain and spinal cord on models and prosected specimen.

Physiology

**CLINICAL CORRELATES:**

1. Relate the interruption of cerebral circulation to cerebral artery syndromes due to anterior, middle and posterior cerebral artery occlusion
2. Correlate the clinical presentation of cerebrovascular accidents with the sites of lesion.

**Cranial Nerves**

Anatomy:

1. Classify the cranial nerves into sensory, motor and mixed nerves.
2. Identify the nuclei and intracranial course of all cranial nerves.

Physiology

**CLINICAL CORRELATES:**

Explain the clinical presentations of lesions of nuclei and intracranial course of all cranial nerves:

**PRACTICALS**

## ANATOMY

1. Histology of nerve and ganglia
2. Histology of Spinal cord
3. Histology of cerebellum
4. Histology of cerebral cortex

**LEARNING OBJECTIVES**  
**MBBS YEAR II**  
**INTEGRATED BLOCK VI**  
**MODULE XI**  
**Maxillofacial & Special Senses**  
**Duration : 06 weeks**

**Topographic anatomy of Skull**

Anatomy

1. Appreciate the norms of skull from different views along with its foramina
2. Enlist the structures traversing the foramina of the bones of the skull
3. Identify important bony landmarks on the bones as viewed from lateral, superior, inferior, anterior and posterior views.
4. Identify the bones forming the boundaries of orbit, nasal cavity, oral cavity, temporal, infratemporal fossa & pterygopalatine fossa on the given bone

**Topographic anatomy of mandible**

Anatomy

1. Describe the ramus and body of the mandible concerning its bony features and attachments.
2. Identify the anatomical parts of the mandible along with its foramina and structures passing through it Explain the clinical presentation of different fractures of the mandible with relevant anatomical basis Identify the bony landmarks and site of attachment of muscles

**Scalp:**

Anatomy

1. Describe the layers of the scalp in a sequential order
2. Correlate gross features of each layer with an anatomical basis of black eye, profuse bleeding, gaping wound, spread of scalp infection and hematoma formation.
3. Demonstrate the extent of the scalp on the given model.
4. Identify the muscles and neurovascular structures related to scalp on prosected specimen/given models

**Face**

Anatomy

1. Elucidate the cutaneous innervation of face
2. Enlist the group of facial muscles according to the orifices they guard.
3. Describe the nerve supply of muscles of facial expressions.

4. Describe the course of arteries, veins, lymphatics and nerves of the face with the help of model.
5. Describe the course and distribution of facial nerve
6. Emphasize the relationship of facial nerve with pterygopalatine and submandibular ganglia
7. Highlight the effects of lesion of facial nerve at different levels
8. Differentiate anatomical basis of clinical presentation of UMN and LMN lesion of facial nerve
9. Correlate gross features of face with anatomical basis of danger area, trigeminal neuralgia, Bell's palsy.
10. Identify muscles of facial expressions
11. Demonstrate the cutaneous innervation of the face on the given model
12. List embryological sources of head and neck structures with special emphasis on pharyngeal apparatus.
13. Tabulate the nerve and blood supply and derivatives of all arches, pouches, clefts and membranes.
14. Describe the embryological basis of first arch syndrome and its relation to cardiac anomalies.
15. Elucidate development of face
16. Correlate various facial clefts with normal development.
17. Justify the association of Neural crest cells and craniofacial defects
18. Apply the knowledge of developmental anatomy to explain Branchial fistulas, sinuses and cysts
19. Identify parts of developing head and neck on given models.
20. Indicate the different developmental phenomenon of head/ neck shown in the diagrams.

## Salivary glands

### Submandibular Region

#### Anatomy

1. Describe the location of major salivary glands (anatomical relations) along with opening of their ducts.
2. Illustrate the secretomotor nerve supply of major salivary glands.
3. Revisit boundaries of submandibular triangle
4. Describe the parts, relations, neurovasculature of submandibular gland.
5. Illustrate the routes of submandibular ganglion
6. Describe the distribution of submandibular ganglion
7. Correlate the anatomy of submandibular fascial space with Ludwig's angina
8. Identify the nerves, vessels and glands in the sub mandibular regions on the given model.
9. Describe the histomorphological features of salivary glands with regards to their secretory and ductal systems
10. Identify H&E Stained slides of submandibular gland and sublingual glands and draw their labelled diagrams

### Parotid Region

#### Anatomy

1. Elucidate the surfaces, borders, shape, location, parts, relations and drainage of parotid gland
2. List contents of parotid region
3. Trace the pathway of autonomic supply of parotid gland.
4. Enumerate structures embedded in parotid gland in a sequential order.
5. Interpret the following clinical conditions related to parotid gland: Infection (mumps) , tumor and stone of parotid gland and Frey's Syndrome
6. Identify the nerves, vessels and glands in the parotid region on the given model
7. Identify H&E Stained slides of parotid gland and draw their labelled diagrams

## **Orbit**

### Anatomy

1. Revisit the skeletal framework of bony orbit and its communications
2. Enlist the contents of orbit
3. Describe the course and distribution of ophthalmic nerve and artery.
4. Enumerate different components of the lacrimal apparatus
5. Describe the nerve supply of the Lacrimal gland
6. Define Horner's Syndrome
7. Explain the developmental anomalies of the nasolacrimal duct

## **Eyeball**

1. Identify extraocular muscles, and neurovascular structures of eyeball on given models
2. Describe the microscopic structure of sclera, cornea, uveal tract, retina and eyelids
3. Revisit the anatomy of the optic pathway
4. Tabulate the attachments, nerve supply, and actions of extraocular muscles
5. Justify the movements of extraocular muscles based on their attachments
6. Identify extraocular muscles, and neurovascular structures of the eyeball on given models
7. Illustrate the course and distribution of 3, 4 and 6 CNs
8. Outline the route and distribution of ciliary ganglion

### Physiology

#### **CLINICAL CORRLATES:**

1. Revisit the course and distribution of CN III, IV and VI
2. Justify the peculiar position of eyeball in case of lesions of these nerves

## **Tongue and Oral Cavity**

### Anatomy

1. Outline the floor, roof, lateral walls and vestibule of oral cavity.
2. Describe topographic features of tongue.
3. Tabulate the actions and nerve supply of muscles (intrinsic and extrinsic) of tongue
4. Tabulate the attachments, nerve supply, actions of muscles of soft palate.

5. Illustrate the pathway of gag reflex
6. Describe the histological features of lip, with emphasis on transition in structure from cutaneous to vermillion to mucosal zone.
7. Explain the histological features of dorsal and ventral surfaces of tongue, with particular focus on tongue papillae, their shape, location, keratinization, number and presence or absence of taste buds
8. Identify an H&E-stained slide of lip and tongue and draw their labeled diagrams

#### Physiology

#### Clinical Correlates

1. Correlate the normal development of tongue with its congenital anomalies (tie, macro- and micro- glossia and bifid tongue)
2. Explain the development of palate and correlate it with palatal clefts
3. Differentiate a case of UMN and LMN lesion of hypoglossal nerve
4. Correlate Lymphatic drainage of different parts of tongue with spread of malignancy and infection of tongue
5. Explain the abnormalities of taste perception

### Temporal & infratemporal regions + TMJ

#### Anatomy

1. Identify the location, boundaries, contents and communications of temporal and infratemporal fossa on a given model and skull.
2. Describe the course and distribution of mandibular nerve from origin to distribution
3. Tabulate the attachments, actions and nerve supply of muscles of mastication.
4. Trace location, various routes and distribution of otic ganglion
5. Justify role of lateral pterygoid as a peripheral heart on anatomical basis of pterygoid venous plexus.
6. Elucidate importance of pterygoid venous plexus in case of intracranial spread of infection to cavernous sinus.
7. Specify the origin and distribution of superficial temporal, First and second parts of the maxillary artery.
8. Specify the origin and distribution of Chorda tympani till it joins the lingual nerve.
9. Outline the type, articular surfaces, capsule, ligaments, supporting factors, movements, and nerve supply of TMJ
10. Describe movements of TMJ regarding axes and muscles producing them
11. Correlate a case of dislocation and reduction of TMJ with anatomical knowledge of TMJ.
12. Identify the nerves, vessels and muscles in temporal and infratemporal fossa on the given model.
13. Identify the involved articular surfaces and site of attachment of muscles on the given model
14. Demonstrate the different movements at the temporomandibular joint on the given model

## Nose and Paranasal Sinuses

### Anatomy

1. Describe the skeletal framework of different walls of nose
2. Describe the features, vascular supply, nerve supply and openings in lateral wall of nose
3. Describe the features, vascular supply, and nerve supply of the medial wall of the nose
4. Highlight the significance of Little's area in a case of epistaxis
5. Identify the location of pterygopalatine fossa on skull
6. List bones forming walls of pterygopalatine fossa
7. Enumerate its contents and communications
8. Describe the distribution of third part of maxillary artery, nerve and pterygopalatine ganglion
9. Justify the role of pterygopalatine ganglion in hay fever/allergies
10. Outline the development of nose and paranasal sinuses
11. Identify the location of paranasal sinuses in sagittal section of skull
12. Demonstrate the location and drainage of paranasal sinuses in skull and on radiograph
13. Demonstrate the structure of lateral wall of nose on the given model
14. Identify the location of pterygopalatine fossa on skull

### Physiology

#### CLINICAL CORRELATES

Explain the clinical importance of little's area of the nose with epistaxis Discuss presentation and management of epistaxis

## Ear and Hearing

### EXTERNAL EAR ANATOMY

1. Describe the gross anatomical features of the auricle, external auditory meatus, and tympanic membrane.
2. Correlate the role of first and second pharyngeal apparatus in development of ear.
3. Describe the differentiation of otic capsule into inner ear.
4. Correlate the anomalies of external ear with neural crest cells
5. Identify the histological structure of different parts of ear, particularly the external and internal ear Identify the gross features of external ear on given model
6. Identify H&E-stained slide of pinna and cochlea and draw their labelled diagrams.

### Physiology

#### CLINICAL CORRELATES

1. Correlate nerve supply of external ear and tympanic membrane with clinical significance (perforation of tympanic membrane)
2. Justify the anatomical basis of otoscopy in infants and adults.

### MIDDLE EAR ANATOMY

1. Describe the gross anatomical features, boundaries, structures and contents of middle ear cavity.
2. Describe the structures forming the walls of middle ear cavity on the given model.
3. Trace/ Outline the pathway and distribution of facial nerve within petrous part of temporal bone  
Identify the walls of middle ear on given mode

#### Physiology

#### CLINICAL CORRELATES:

Highlight the importance of infection in middle ear cavity in relation to its relevant communications.

#### INNER EAR ANATOMY

1. Identify the bony and membranous parts of inner ear on model
2. Describe the histological structure of sensory receptor areas of internal ear like Organ of Corti maculae acousticae and crista ampullaris
3. Identify the cells and spaces in cochlea
4. Identify the parts of bony and membranous parts of inner ear on given

#### Physiology

#### CLINICAL CORRELATES

1. Explain following clinical conditions – Motion sickness, Hearing loss, Meniere disease Describe various hearing Abnormalities
2. Discuss the various hearing tests including auditory evoked potentials (especially in reference to menier's disease)
3. Interpret audiometry findings in perceptive and conductive deafness
4. Discuss presentation, investigation and management of hearing loss and common hearing disorders

## Neck

#### Anatomy

#### Hyoid bone & Cervical vertebrae

1. Explain the gross features and attachments of the hyoid bone
2. Give distinguishing features of each cervical vertebra.
3. Compare the key anatomical features of each cervical vertebra.
4. Enumerate structures passing through foramina
5. Identify the types and movements of atlantoaxial and atlanto-occipital joints
6. Outline ligamentous attachments on cervical vertebrae.

#### Superficial Fascia

1. Outline contents of the superficial fascia of the neck (platysma, external jugular vein)
2. Illustrate cutaneous innervation of neck

#### Deep Cervical Fascia

1. Enumerate the layers of deep cervical fascia.
2. Trace / Specify the attachments of investing, pre-tracheal, carotid sheath, and prevertebral layers of fascia.
3. Identify various modifications and neck spaces formed by fascial attachments.
4. Comprehend / Describe the clinical importance of neck spaces in the spread of infection

#### Triangles of the Neck

1. Tabulate the attachments, nerve supply, actions of superficial and deep muscles of neck (sternocleidomastoid, suprahyoid, infrahyoid, suboccipital, prevertebral muscles,).
2. Identify boundaries and contents of triangles of neck on model
3. Describe the origin, course and distribution of vessels and nerves of neck (cervical plexus, Ansa cervicalis, Common carotid artery, Internal jugular vein, subclavian vessels)
4. Analyze a case of lesion of accessory glossopharyngeal and vagus nerve on anatomical basis.
5. Describe the clinical features of torticollis

#### Larynx

1. Describe laryngeal wall in detail with emphasis on cartilages, ligaments, muscles, vascular supply and nerve supply.
2. Analyze mechanism of abduction and adduction of vocal cords
3. Distinguish clinical presentations of injury to external, internal and recurrent laryngeal nerves. Recognize clinical significance of piriform fossa
4. Explain the following with reference to their anatomical basis: - Laryngoscopy - Aspiration of foreign body from laryngopharynx

#### Pharynx

1. Differentiate extent, anatomical features, vascular supply, nerve supply of three parts of pharynx on anatomical basis
2. List muscles of pharynx with nerve supply and action
3. Name structures passing through the spaces between muscles of pharynx
4. Trace origin of pharyngobasilar fascia on base of skull.
5. Correlate anatomical knowledge of pharyngobasilar fascia with patency of nasopharynx
6. Justify role of Eustachian tube in equalizing middle ear pressure, age related obliquity
7. Describe anatomical route of spread of infections from nasopharynx to middle ear.
8. Relate boundaries of tonsillar fossa and tonsillar bed with significant structures that must be protected during tonsillectomy.
9. Define Kilian's

#### Lymphatic drainage of neck

1. Enumerate the groups of lymph nodes draining the neck.
2. Describe their location and areas of drainage.
3. Describe the formation of jugular lymph trunk.
4. Describe the clinical importance of lymphatic drainage of neck.

#### Great Vessels of the Neck

Describe the course and branches/tributaries of the respective vessels: Common carotid artery - External carotid artery - Internal carotid artery - Internal Juglar vein

Physiology

## **Integumentary System**

Anatomy

1. Describe the development of skin, hair, nails and mammary gland
2. Describe the embryological basis of relevant congenital anomalies (vitiligo, ichthyoses, hemangiomas and dermatoglyphics and mammary gland anomalies)
3. Describe the components of skin, its epithelium (including the various cells of epidermis along with their functions), nail, hair and mammary gland.
4. Explain histological differences between thick and thin skin.
5. Describe the various appendages of the skin.
6. Distinguish the histological structure of mammary gland between inactive, active, and lactating phases.
7. Identify an H&E-stained slide of thick and thin skin and mammary gland (inactive and active phases)

## **PRACTICALS:**

Anatomy

Identify and illustrate the microscopic structure of following:

1. Parotid gland
2. Submandibular gland
3. Sublingual gland
4. Mammary gland
5. Thick Skin
6. Nail

## **THEME BASED LEARNING :**

1. Danger areas face/ Cavernous sinus thrombosis
2. Oral cavity cancers/ lesions
3. Parotid gland swelling/ Mumps
4. Cranial Nerves lesions

5. Otitis Media/ Deafness
6. Anosmia

**MBBS YEAR II**  
**BLOCK VI**  
**INTEGRATED MODULE XII**  
**Endocrinology**  
**Duration: 05 weeks**

## **Introduction to Endocrine glands**

Anatomy

1. Classify the glands
2. Describe the structure and location of all endocrine glands in the body

## **Hypothalamus and Pituitary Gland**

Anatomy

1. Describe the gross anatomy, neurovascular supply and clinical importance of pituitary gland
2. Describe the development and congenital anomalies of pituitary gland
3. Describe the histological features of pituitary gland
4. Clinical Relevance Relate the knowledge of pituitary gland and hypothalamus to understand following diseases
  - Panhypopituitarism/ Sheehan's Syndrome
  - Pituitary Adenomas
  - Gigantism Vs Acromegaly
  - Dwarfism

## **Thyroid Gland**

Anatomy

1. Describe the gross anatomy, neurovascular supply and clinical importance of Thyroid gland
2. Describe the microscopic features of thyroid gland
3. Describe the development and congenital anomalies of thyroid gland (thyroglossal cyst and accessory thyroid gland)

## **Parathyroid Gland**

Anatomy

1. Describe the gross anatomy, neurovascular supply and clinical importance of parathyroid glands
2. Describe the development and congenital anomalies of parathyroid glands
3. Describe the microscopic features of parathyroid gland

**CLINICAL CORRELATES**

1. Correlate the pathophysiology of Hypo and hyper parathyroidism with their clinical presentations and biochemical profile
2. Differentiate between Rickets and Osteomalacia

## **Adrenal Glands**

Anatomy:

1. Revisit the gross anatomy, neurovascular supply and clinical importance of adrenal gland
2. Describe the development and congenital anomalies of adrenal gland
3. Describe the microscopic features of adrenal gland

### **CLINICAL CORRELATES:**

Correlate the pathophysiology of Hypoadrenalism and Hyperadrenalism with its clinical presentation and biochemical profile

## **Pancreas as Endocrine Organ**

Anatomy:

1. Revisit the gross anatomy, neurovascular supply and clinical importance of endocrine portion of pancreas.
2. Revisit the histological features of Pancreas

### **CLINICAL CORRELATES**

1. Discuss the pathophysiology of various types of Diabetes Mellitus and associated micro and macrovascular complications
2. Outline the treatment modalities of Diabetes Mellitus
3. Correlate the clinical presentation of hypoglycaemia with varying levels of blood glucose

## **Male Reproductive System**

Anatomy:

Revisit the gross and histological features of male reproductive organs

### **CLINICAL CORRELATES:**

Correlate the pathophysiology of male infertility with hormone profile and semen analysis

## **Female Reproductive System**

Anatomy:

Revisit the gross and histological features of female reproductive organs

### **CLINICAL CORRELATES:**

1. Correlate the pathophysiology of female infertility with hormonal profile

2. Interpret pregnancy tests
3. Compare different contraceptive methods

## **PRACTICALS:**

Anatomy:

Identify the slides, illustrate and describe the light microscopic features with two points of identifications of the followings:

- Pituitary gland
- Thyroid gland
- Parathyroid glands
- Pancreas
- Adrenal cortex and adrenal medulla
- Male genital ducts + accessory genital glands
- Female reproductive parts

## **THEME BASED LEARNING**

1. Disorders of pituitary gland
2. Disorders of thyroid/ parathyroid gland
3. Diabetes Mellitus
4. Disorders of adrenal gland
5. Disorders of male/ female reproductive system



