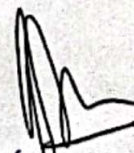


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**DEPARTMENT OF PATHOLOGY  
GMERS MEDICAL COLLEGE – JUNAGADH**

**2<sup>nd</sup> M.B.B.S. Pathology  
SYLLABUS  
(Old Course)**



Professor & Head  
Department of Pathology  
G.M.E.R.S. Medical College & Hospital  
Junagadh

## OBJECTIVES

A MBBS student at the end of training in Pathology will be able to:

1. Understand the concepts of cell injury and changes produced thereby in different tissues and organs and the body's capacity for healing.
2. Understand the normal homeostatic mechanisms, the derangements of these mechanism and the effects on human systems.
3. Understand the etiopathogenesis, the pathological effects and the clinico-pathological correlation of common infectious and non-infectious diseases.
4. Understand the concept of neoplasia with reference to the etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.
5. Correlate normal and altered morphology (gross and microscopic) of different organ systems in different diseases to the extent needed for understanding of disease processes and their clinical significance.
6. Have a knowledge of common immunological disorders and their resultant effects on the human body.
7. Have an understanding of the common haematological disorders and the investigations necessary to diagnose them and determine their prognosis.
8. Perform and interpret in a proper manner the basic clinico-pathological procedures.
9. Know the principles of collection, handling and dispatch of clinical samples from patients in a proper manner.

## COURSE CONTENTS

### (A) General Pathology

#### 1. Introduction to Pathology

#### 2. Cell Injury

- a) Cell injury: Causes and Mechanism: Ischemic, Toxic.
- b) Reversible cell injury : Types, morphology: Swelling, vacuolation, hyaline, fatty change.
- c) Irreversible cell injury : Types of Necrosis

#### 3. Amyloidosis and Calcification

- a) Calcification : Dystrophic and Metastatic
- b) Amyloidosis : classification, Pathogenesis, Morphology

#### 4. Inflammation and Repair

- a) Acute inflammation : Features, causes, vascular and cellular events.
- b) Morphologic variants of acute inflammation
- c) Inflammatory cells and Mediators
- d) Chronic inflammation : Causes, types, nonspecific and Granulomatous with examples
- e) Wound healing by primary and secondary union, factors promoting and delaying the process
- f) Healing at specific sites including bone healing

#### 5. Circulatory Disturbances

- a) Edema : Pathogenesis and types
- b) Chronic venous congestion : Pathogenesis and changes in Lung, Liver, Spleen
- c) Thrombosis and Embolism : Formation, Fate and Effects
- d) Infarction : Types, common sites, Gangrene
- e) Shock : Pathogenesis, Types, Morphologic changes

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## 6. Growth Disturbances and Neoplasia

- a) Atrophy, Hypertrophy, Hyperplasia, Hypoplasia, Metaplasia, Agenesis, Dysplasia
- b) Neoplasia : Classification, Histogenesis, Biologic Behaviour : Benign and Malignant, Carcinoma and Sarcoma
- c) Malignant Neoplasia : Grades and Stages, Local and distant spread
- d) Carcinogenesis : Environmental carcinogens, chemical, viral, occupational, Heredity and cellular oncogenes
- e) Tumour and Host Interactions : Systemic effects including paraneoplastic syndromes, Tumor immunology
- f) Laboratory diagnosis : Cytology, Biopsy, Tumor markers

## 7. Immunopathology

- a) Immune system : organisation, cells, antibodies and regulation of immune responses.
- b) Primary immunodeficiency
- c) Secondary Immunodeficiency including HIV Infection
- d) Auto-immune disorders like systemic lupus erythematosus; organ specific and non-organ specific such as polyarteritis nodosa, Hashimoto's disease.
- e) Tumor Immunity
- f) Organ transplantation : Immunologic basis of Rejection and Graft versus host reaction

## 8. Infectious Diseases

- a) Mycobacterial Diseases : Tuberculosis and Leprosy
- b) Bacterial diseases : Pyogenic, Typhoid, Diphtheria, Gram negative infection, Bacillary dysentery, Syphilis
- c) Viral : HBV, HPV, HCV infections
- d) Fungal diseases and opportunistic infections
- e) Parasitic Diseases : Malaria, Filariasis, Amebiasis, Kala-azar, Cysticercosis, Hydatid
- f) AIDS : Aetiology, modes of transmission, diagnostic procedures and handling of infected material and health education.

## 9. Miscellaneous Disorders

- a) Autosomal and sex-linked disorders with examples
- b) Metabolic disorders
- c) Protein energy malnutrition and vitamin deficiency disorders
- d) Disorders of Pigment and Mineral metabolism such as bilirubin, melanin, hemosiderin

# (B) Systemic Pathology including Autopsy

## 1. Cardiovascular Pathology

- a) Rheumatic fever and Rheumatic Heart Disease : Pathogenesis, Morphology and effects
- b) Infective Endocarditis : Causes, Pathogenesis and Morphology
- c) Atherosclerosis and Ischemic Heart Disease; Myocardial Infarction
- d) Diseases of blood vessels other than atherosclerosis
- e) Hypertension and Hypertensive Heart Disease
- f) Congenital Heart Disease : ASD, VSD, Fallot's Bicuspid aortic valve, PDA
- g) Pericarditis and other pericardial diseases
- h) Cardiomyopathy

## 2. Respiratory Pathology

- a) Structure of Bronchial tree and alveolar walls, normal and altered lung function; concept of obstructive and restrictive lung disorders

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- b) Inflammatory diseases of bronchi : chronic bronchitis, bronchial asthma, bronchiectasis, chronic obstructive lung disease
- c) Pneumonias : Lobar, Broncho, Interstitial
- d) Pulmonary suppuration including lung abscess : Etiopathogenesis and Morphology
- e) Pulmonary Tuberculosis : Primary and Secondary, Morphologic types including pleuritis
- f) Emphysema : Types, pathogenesis
- g) Tumors : Benign; Carcinoid, Malignant; Squamous cell, Oat cell, Adeno, etiopathogenesis
- h) Occupational lung disorders : anthracosis, silicosis, asbestosis, mesothelioma

### 3. Urinary Tract Pathology

- a) Renal structure, basis of impaired function, urine analysis
- b) Glomerulonephritis : Classification, Primary Proliferative and Non Proliferative
- c) Secondary Glomerulonephritis : SLE, Purpura, Polyarteritis, Amyloidosis, Diabetes
- d) Nephrotic Syndrome
- e) Acute Renal Failure : Acute tubular and cortical necrosis
- f) Progressive renal failure and end stage renal disease
- g) Pyelonephritis, Reflux Nephropathy, Interstitial Nephritis
- h) Renal tumors : Renal cell carcinoma, Nephroblastoma
- i) Renal vascular disorders, kidney changes in Hypertension
- j) Renal Malformations : Polycystic kidneys

### 4. Pathology of the Gastro-Intestinal Tract

- a) Lesions of Esophagus
- b) Salivary gland tumors : Pleomorphic adenoma, warthin's tumor, Adeno Carcinoma.
- c) Peptic ulcer : etiopathogenesis and complications; gastritis: types
- d) Tumors of stomach : Benign; Polyp, Leiomyoma, Malignant; Adenocarcinoma, Lymphoma
- e) Inflammatory diseases of small intestine : Typhoid, Tuberculosis, Crohn's, Appendicitis
- f) Inflammatory diseases of appendix and large intestine : Amoebic colitis, Bacillary dysentery, Ulcerative Colitis
- g) Malabsorption : Celiac disease, Tropical sprue and other causes
- h) Tumours and Tumor like condition of the large and small intestine : Polyps, Carcinoid, Carcinoma, Lymphoma

### 5. Hematopathology

- a) Constituents of blood and bone marrow, Regulation of hematopoiesis
- b) Anaemia : classification and clinical features; clinical and lab. approach to diagnosis
- c) Nutritional anaemias : Iron deficiency anaemia, Folic Acid/Vit B 12 deficiency anaemia including pernicious anaemia
- d) Hemolytic Anaemias : Classification and investigation
- e) Hereditary hemolytic anaemias : Thalassemia, sickle cell anaemia
- f) Hereditary hemolytic anaemias : hereditary spherocytosis, G-6-PD deficiency
- g) Acquired hemolytic anaemias
- h) Aplastic Anaemia, PNH and Myelodysplastic syndrome
- i) Hemostatic disorders : Platelet deficiency; ITP, Drug induced, secondary
- j) Coagulopathies : Coagulation factor deficiency; hemophilia, DIC and anticoagulant control
- k) Leukocytic disorders : Leukocytosis, leukopenia, leukemoid reaction
- l) Acute and chronic Leukemia : Classification, Diagnosis
- m) Myeloproliferative disorders : Polycythemia, Myelofibrosis
- n) Multiple myeloma and dysproteinemias
- o) Blood transfusion : grouping and cross matching, untoward reactions, transmissible infections including HIV and hepatitis

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## 6. Liver and Biliary Tract Pathology

- a) Jaundice : Types, Pathogenesis and Differentiation
- b) Hepatitis : Acute and Chronic, Etiology, Pathogenesis and Pathology
- c) Cirrhosis: Etiology, Postnecrotic, Alcoholic, Metabolic, Pathology, Morphology (Macronodular, Micronodular, Mixed), complications
- d) Portal Hypertension : Types including non-cirrhotic portal fibrosis and Manifestations
- e) Tumors of Liver : hepatocellular and metastatic carcinoma, tumor markers
- f) Diseases of the gall bladder : Cholecystitis, Cholelithiasis,.

## 7. Lymphoreticular System

- a) Lymphadenitis : nonspecific, Granulomatous
- b) Hodgkin's and Non-Hodgkin's Lymphomas : Classification, Morphology
- c) Diseases of the spleen : Splenomegaly causes and effects

## 8. Reproductive System

- a) Diseases of cervix : cervicitis, cervical carcinoma, etiology, types and cytologic diagnosis
- b) Hormonal influences and histological appearances of different phases of menstrual cycle and the abnormalities associated with it
- c) Diseases of uterus : endometritis, endometrial hyperplasia and carcinoma, adenomyosis, smooth muscle tumors
- d) Trophoblastic disease : Hydatidiform mole, Choriocarcinoma
- e) Diseases of the breast : Mastitis, abscess, Fibrocystic disease, Neoplastic lesions : Fibroadenoma, Carcinoma, Phyllodes tumor
- f) Prostate : Nodular Hyperplasia and Carcinoma
- g) Ovarian and testicular tumors
- h) Pelvic inflammatory diseases including salpingitis
- i) Genital Tuberculosis

## 9. Osteopathology

- a) Bone – general considerations, reactions to injury and healing of fractures
- b) Osteomyelitis : Acute, Chronic, Tuberculous, Mycetoma
- c) Tumors : Primary, Osteosarcoma, Osteoclastoma, Ewing's Sarcoma, Chondrosarcoma; Metastatic
- d) Arthritis : Rheumatoid, Osteo and tuberculous

## 10. Endocrine Pathology

- a) Diabetes Mellitus : Types, Pathogenesis, pathology
- b) Nonneoplastic lesions of thyroid : Iodine deficiency goiter, autoimmune thyroiditis, thyrotoxicosis, myxedema
- c) Tumors of thyroid – adenoma, carcinoma : Papillary, Follicular, Medullary, Anaplastic
- d) Parathyroid hyperplasia and tumors and Hyperparathyroidism
- e) Multiple endocrine neoplasia

## 11. Neuropathology

- a) Structural Organization, specific cell types, and reaction patterns
- b) Inflammatory disorders : Pyogenic and tuberculous meningitis, brain abscess, tuberculoma
- c) CNS tumors – primary : glioma and meningioma (excluding histopathology) and metastatic
- d) CSF and its disturbances : cerebral edema, raised intracranial pressure
- e) Cerebrovascular diseases : Atherosclerosis, thrombosis, embolism, aneurysm, Hypoxia, Infarction and Hemorrhage

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### (C) Practicals

- a) Identify and interpret the gross and/or microscopic features of common disorders as given above.
- b) Perform with accuracy and reliability basic haematological procedures such as haemoglobin estimation, total and differential WBC count and peripheral blood smear staining, examination and report.
- c) Calculate the indices and interpret the relevant significance.
- d) Perform the basic laboratory haematological tests like bleeding time and clotting time
- e) Perform a complete examination of the urine and detect any abnormalities
- f) Grouping and cross matching of blood
- g) Collect and dispatch clinical samples from patients in a proper manner
- h) Interpret abnormal biochemical laboratory values of common diseases.

### TEACHING AND LEARNING METHODOLOGY

Department stresses on teaching basic fundamentals of the disease process and the applied aspects relevant to the clinical subjects.

#### General Pathology

Taught with the help of Didactic lectures, Small group discussions, tutorials, seminars & quiz on specific topics, followed by Practicals pertaining to that topic. Besides microscopic examination, fresh specimens obtained at autopsy or surgical operations are shown.

#### Systemic Pathology

The following tools are employed:

- i) Didactic lectures: discussing a particular topic at length in an one hour lecture
- ii) Small group discussions, tutorials, seminars & quiz.
- iii) Paraclinical seminars: are conducted by a combined team of pathologist and a clinician who discuss the pathophysiology and clinical aspects of the particular disease entity.
- iv) Case studies: The significant and common diseases are discussed in the form of a representative clinical case in which the clinical features, the course of the disease in that particular patient and relevant laboratory investigations are discussed in an interactive manner in small groups. This is followed by demonstration of the gross and microscopic features of the disease in that case. This is followed by clinico-pathologic correlation.
- v) Practicals

Deals with demonstration of gross, and/or microscopic features of the disease entities.

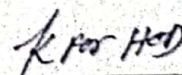
#### vi) Clinical case demonstration

Patients of a particular disease are demonstrated to the students by a clinical faculty in the ward, discussing the clinical features in the patient which provides them a real-life experience of studying a disease as it presents in a patient.

By a combination of above modalities/tools, student learns applied aspects of the disease process.

#### TEXT-BOOKS RECOMMENDED

1. Robbin's Pathologic Basis of Diseases
2. Text-Book of Pathology by Harsh Mohan
3. Text-Book of Pathology by Vinay Kamal
4. Departmental Journal, Clinical Pathology & Histo pathology.
5. Autopsy Manual.



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## EXAMINATION AND MARKS DISTRIBUTION

**Total Marks: 150**

**Internal Assessment: 30** (Theory 15, Practical 15)

**Professional (University) Examination: 120** (Theory 80, Viva 15, Practical 25)

- The Pattern for internal assessment will be as follows:

| Examination | Semester/term wise distribution | Examination                 | Total No. of Marks | Internal Calculation |
|-------------|---------------------------------|-----------------------------|--------------------|----------------------|
| Theory      | III Semester                    | First Internal Examination  | 100                | 2.5                  |
|             | IV Semester                     | Second Internal Examination | 100                | 2.5                  |
|             | V Semester                      | Prelim Examination          | 100                | 10                   |
|             |                                 | <b>Total</b>                |                    | <b>15</b>            |
| Practicals  | III Semester                    | First Internal Examination  | 50                 | 2.5                  |
|             | IV Semester                     | Second Internal Examination | 50                 | 2.5                  |
|             | V Semester                      | Prelim Examination          | 50                 | 10                   |
|             |                                 | <b>Total</b>                |                    | <b>15</b>            |

### \*Eligibility Criteria to appear in University exam

- Internal mark should be more than 35%
- Attendance in Theory classes more than 75%
- Attendance in Practical more than 75%

➤ **Note: If any one of above criteria is not fulfill students will be detained as per rules of University.**

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**Professional (University) Examination:**

**Theory:**

**Paper I: (40 Marks)**

Topics: General Pathology, Immunopathology, Blood Transfusion, Hematopathology

**Paper II: (40 Marks)**

Topics: Systemic Pathology including Autopsy, Cytopathology, Histopathology techniques, clinical Pathology.

**Viva: (15 Marks)**

1. Gross specimen & General Pathology viva : 8 Marks
2. Clinical Pathology Viva : 7 Marks.

**Practicals: (25 Marks)**

**Theory Papers:** Comprise of Short notes, Short answered questions (SAQ), Autopsy.

**Practicals:** Conventional Urine & CSF examinations and viva, Hematology Exercises and viva and Histopathology slides.



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**DEPARTMENT OF PATHOLOGY**  
**G.M.E.R.S. MEDICAL COLLEGE, JUNAGADH**

**2<sup>nd</sup> M.B.B.S. EXAMINATION (Old Course)**

**INTERNAL & EXTERNAL (UNIVERSITY) EXAMINATION MARKS DISTRIBUTION PATTERN**

| Examination                         | Theory                                                                     |          | MCQs | Viva | Theory Total | Practical | Internal Assessment |                       |
|-------------------------------------|----------------------------------------------------------------------------|----------|------|------|--------------|-----------|---------------------|-----------------------|
|                                     |                                                                            |          |      |      |              |           | Theory              | Practical             |
| 1 <sup>st</sup> Internal Assessment | 60                                                                         |          | 20   | 20   | 100          | 50        | 2.5                 | 2.5                   |
| 2 <sup>nd</sup> Internal Assessment | 60                                                                         |          | 20   | 20   | 100          | 50        | 2.5                 | 2.5                   |
| Preliminary Examination             | Paper-I                                                                    | Paper-II | ---  | 20   | 100          | 50        | 10                  | 10                    |
|                                     | 40                                                                         | 40       |      |      |              |           |                     |                       |
| University Examination              | Paper-I                                                                    | Paper-II | ---  | 15   | 95           | 25        | 15                  | 15                    |
|                                     | 40                                                                         | 40       |      |      |              |           |                     |                       |
| University Examination              | Theory= Paper-I & II(80),<br>Viva(15),<br>Internal Marks(15)-<br>Total-110 |          |      |      |              |           |                     | Practical<br>Total-40 |

- Theory Viva will be taken at the time of Pathology Practical Exam.

  
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**Second Year M. B. B. S. Examination****(Old Course)****Pathology: Paper – I****(General Pathology, Immunology, Blood Transfusion , Hematology)****Time: 2 Hours]****[Total Marks: 40****Instruction:**

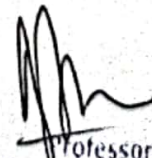
- A. Write answers of each section separately.
- B. Draw neat & clean diagrams wherever necessary.
- C. Figures to the right indicate full marks.
- D. Irrelevant writing will reduce the marks.

**SECTION – I****(General Pathology including Neoplasia)**

- |          |                                    |           |
|----------|------------------------------------|-----------|
| <b>1</b> | <b>Write notes on: (Any Three)</b> | <b>12</b> |
|          | a)                                 |           |
|          | b)                                 |           |
|          | c)                                 |           |
|          | d)                                 |           |
| <b>2</b> | <b>Answer in brief: (Any Four)</b> | <b>8</b>  |
|          | a)                                 |           |
|          | b)                                 |           |
|          | c)                                 |           |
|          | d)                                 |           |
|          | e)                                 |           |

**SECTION – II****(General Pathology, Immunology, Blood Transfusion , Hematology)**

- |          |                                    |           |
|----------|------------------------------------|-----------|
| <b>3</b> | <b>Write notes on: (Any three)</b> | <b>12</b> |
|          | a)                                 |           |
|          | b)                                 |           |
|          | c)                                 |           |
|          | d)                                 |           |
| <b>4</b> | <b>Answer in brief: (Any Four)</b> | <b>8</b>  |
|          | a)                                 |           |
|          | b)                                 |           |
|          | c)                                 |           |
|          | d)                                 |           |
|          | e)                                 |           |

  
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**Second Year M. B. B. S. Examination****(Old Course)****Pathology: Paper – II****(Autopsy, Systemic Pathology, Cytopathology, Histopathology Techniques, Clinical Pathology, Museum Techniques)****Time: 2 Hours]****[Total Marks: 40****Instruction:**

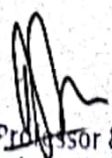
- E. Write answers of each section separately.**
- F. Draw neat & clean diagrams wherever necessary.**
- G. Figures to the right indicate full marks.**

**SECTION – I****(Autopsy, Systemic Pathology)**

- |          |                                                              |          |
|----------|--------------------------------------------------------------|----------|
| <b>2</b> | <b>Write autopsy findings</b>                                | <b>8</b> |
| <b>3</b> | <b>(a) Write notes on: (Any Two)</b><br>a)<br>b)<br>c)<br>d) | <b>8</b> |
|          | <b>(b) Answer in brief: (2 marks each)</b><br>a)<br>b)       | <b>4</b> |

**SECTION – II****(Systemic Pathology, Cytopathology, Histopathology Techniques, Clinical Pathology, Museum Techniques)**

- |          |                                                                  |           |
|----------|------------------------------------------------------------------|-----------|
| <b>4</b> | <b>Write notes on: (Any Four)</b><br>a)<br>b)<br>c)<br>d)<br>e)  | <b>12</b> |
| <b>5</b> | <b>Answer in brief: (Any Four)</b><br>a)<br>b)<br>c)<br>d)<br>e) | <b>8</b>  |

  
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