

**DUBAI MEDICAL COLLEGE FOR
GIRLS
PATHOLOGY DEPARTMENT**

**PATHOLOGY
THE COURSE BOOKLET
FOR STUDENT & STAFF**

**THE ACADEMIC YEAR 2004-2005
PRE-CLINICAL STAGE**

**BY
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In the name of Allah, the most Gracious the most merciful

1.	• The subject	Pathology
2.	• Level of students	1 st & 2 nd year, pre-clinical stage
3.	• Pre-requisites	1 st & 2 nd year, pre-clinical stage of the curriculum of Histology, Physiology, Biochemistry and Anatomy.

Vision & Objectives

1. Affirming faith in Allah's divinity and our servitude to Him.
2. Acquisition of knowledge in the field of medicine and surgery to a level that enables them to pursue their profession with ability and distinction.
3. A college intensive curriculum and college calendar that effectively uses the period of stay of students within the college to maximum benefit there by preparing them to be doctors capable of delivering services of the highest standards and of being to work under high pressure.
4. Modernizing the teaching method with a view to promoting better student response and self-learning.
5. Uniqueness of the study material through making it three-dimensional- where possible- (i) the dimension of bare information or knowledge, (ii) the dimension of theoretical exercises on that knowledge, and (iii) practical application of that knowledge. These could be reworded for more clarity – Pre Clinical , Clinical and Internship.
6. Producing a female doctor of distinction, possessed of high level of modern scientific knowledge, capable of discharging her responsibilities after obtaining the degree of Bachelor in Medicine and Surgery.
7. Producing a female doctor who is equipped with (i) the Islamic morals, (ii) a deep understanding of our faith, (iii) the knowledge of Islamic commandments related to women in addition to those relating to the medical profession, (iv) familiarity with doctor – to- patient and doctor – to- doctor relationship, and (v) other etiquettes of the profession drawn from the Holy Book and the traditions of the Holy Prophet.
8. Providing qualified Muslim female doctors for the treatment of women patients in the fast developing society of the UAE which is in need of female medical cadres.
9. Affording the girls of the UAE an opportunity to study medicine inside the country learning from all good practices and built on core values that are Islamic and aligned with the social culture of the area.
10. Restricting admission to the College to female candidates alone in order to avoid the system of co-education.
11. Giving the expatriate girl students an opportunity to study medicine in the UAE.
12. To bring in the idea of using the Arabic medium to improve communication to develop the knowledge base in Arabic so that it is useful for society in the long run.

INTRODUCTION

Pathology is the science, which deals with the study of diseases. It is concerned with:
The causes of the disease or disorder.

The effects of the disease producing agents, (Upon the living human body). The ultimate objective of physicians who study pathology is the prevention and cure of disease, but first they must study disease as an entity in itself because only in this way they start to discover mechanisms in the disease producing process.

The course of Pathology, spans the gap between the preclinical and clinical subjects. It has the great advantage of providing the student in early part of her hospital experience, with a basic knowledge of the diseases she is likely to encounter most often in the wards and clinics.

Objectives of the Course

The objectives of studying pathology are categorized as:

Ultimate and Terminal

Ultimate objectives are those to be achieved at the end of the 2nd year, while the terminal objectives are those connected with various parts of the pathology course.

Ultimate Objectives

1. The students will acquire good and up to date knowledge about the etiology and pathogenesis of different diseases in the human body.
2. The students will be capable of diagnosis of the different lesions in the different organs inside the human body both by the naked eye appearance and by microscopic examination of these lesions following every topic in the theoretical lectures.
3. The main objective is to lay a basis of knowledge about fundamental responses that are common to many disorders, when the student has mastered the basic responses she will find no difficulty in understanding special disorders in various systems of the body and consequently, she will be able to diagnose the different diseases easily in the clinical phase later on.
4. The student should be aware of the ability of the creator to protect the human kind and all the creatures from all the diseases through natural protective mechanisms in the body and if the man did not protect himself by keeping away from these things forbidden in both *Quran and Sunnah*, then he will develop so many health problems and diseases.

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Terminal Objectives and outcomes :

These are divided into the following units:

1. Introduction to the study of pathology
2. General Pathology
3. Systemic or special pathology.

1. INTRODUCTION

The student will define of the different terms used in the study of diseases in the different courses in pathology.

2. GENERAL PATHOLOGY:- Which is concerned with the basic reactions of the cells and tissues to abnormal stimuli.

Its study includes the followings:

Inflammation:-

Prerequisites: The student should have a good basis in immunology and connective tissue histology and forces controlling diffusion and perfusion of fluids from the vascular compartments in physiology.

Learning objectives and outcomes:

By the end of this topic the student should be able to:

1. Describe the sequence of vascular changes in acute inflammation (vasodilation, increased permeability) and their purpose.
2. Know the mechanisms of increased vascular permeability and know which vessels are affected in the immediate transient response.
3. Describe the steps involved in extravasation of leukocytes from the blood to the tissues. Know the steps at which selectins and integrins act.
4. Define the terms edema, transudate, and exudate.
5. Describe the steps involved in extravasation of leukocytes from the blood to the tissues.
6. Describe the meaning and utility of chemotaxis. The biochemical changes need not be memorized and understand the role that chemokines play in inflammation.
7. Describe the steps involved in phagocytosis and the role of IgG and C3b as opsonins and receptors and know the leukocyte receptors for these opsonins.
8. Should learn the cellular sources and major effects of the chemical mediators and list the most likely mediators of each of the steps of inflammation .
9. Compare and contrast acute vs chronic inflammation with respect to causes, nature of the inflammatory response, and tissue changes.
10. Compare and contrast the clinical settings in which different types of inflammatory cells (eg, neutrophils, eosinophils, monocyte-macrophages, and lymphocytes) accumulate in tissues. Compare and contrast the contents of neutrophil and eosinophil granules.
11. Describe the differences between the various cell types (ie, labile, stable, and permanent cells) in terms of their regeneration potential. List examples of each cell type.
12. Distinguish between fibrinous, purulent, and serous inflammation. Define an abscess.
13. Describe the systemic manifestations of inflammation and their general physiology, including fever, leukocyte left shift, and acute phase reactants.

14. Compare and contrast the oxygen-dependent and -independent mechanisms of microbial killing and the relative importance of these two pathways.

Cell Injury (Degeneration)

Prerequisites: The student should have a good basis in the structure (histology), function (physiology) and metabolism (biochemistry) of the cell ..

Learning objectives and outcomes:

By the end of this topic the student should be able to:

1- Identify the effect of the different injurious agents on the cell cytoplasm and nucleus.

2- Describe the normal cellular structures (in Histology course), she will be easily able to recognize the abnormalities in the cell cytoplasm as well as the nucleus.

3- Explain the morphological, biochemical and metabolic changes in the cell cytoplasm which are divided into the followings:

- Cloudy Swellings.
- Hydropic degeneration.
- Mucoid degeneration.
- Hyalinosis of the cell.
- Fatty Changes.

4- Describe the morphological, biochemical and metabolic changes in the cell cytoplasm as well as the nucleus as a result of exposure of the cell to injurious agents ,that is called cell death.

5- At this level the student will be able to differentiate between the effect of mild cell injury (Degeneration) and severe cell injury (Cell death), both by the naked eye appearance and microscopically.

6- The importance of this ability is to predict the course and fate of the disease affecting the organs and whether it is reversible or not.

7- The student should be aware about the fact that If the man did not protect himself by keeping away from these things forbidden in both Quran and Sunnah as-for exmaple- alcohol consumption causes severe disturbance in fat metabolism resulting in liver cell injury and fatty change of the liver (alcoholic liver steatosis) which will lead to liver cell failure and death. Destruction of the brain cells also results in disturbed neuronal function and irreversible damage to the brain cells. Accordingly, , he will develop so many health problems and diseases.

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2-3 Necrosis :

Prerequisites: The student should have a good basis in the structure (histology), function (physiology) and metabolism (biochemistry) of the cell ..

Learning objectives and outcomes:

By the end of this topic the student should be able to:

- 1- Define what is necrosis.
- 2- List the different types of necrosis and its mechanisms :
4. Describe the examples for each type accordingly...
5. Appraises the splendor ability of Allah to protect our own tissues from being destroyed easily during life by keeping our cellular contents inside membrane called cell membrane and keeping very dangerous enzymes (lysozymes) enclosed within membranes in cellular organelles called lysosomes.

Apoptosis:

Prerequisites: The student should have a good basis in the structure (histology), function (physiology) and metabolism (biochemistry) of the cell.

Learning objectives and outcomes:

By the end of this topic the student should be able to:

- 1- Define what is apoptosis and differentiate between it and necrosis.
- 2- Identify the different types of apoptosis (physiologic and pathologic).
- 3- Explain the mechanism of apoptosis and the factors controlling it and its importance in embryogenesis and carcinogenesis.
- 4- The student's attention should be directed to the grandiosity of the **Creator** which is quite clear in the process of apoptosis.
- 5- Predict that if this process will not occur, the baby will suffer from congenital anomalies (spina bifida, syndactyly, patent ductus arteriosus.....

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Repair and Healing:-

Prerequisites: The student should have a good basis in connective tissue cells and the different types of the cells depending on its ability of division. The student should have a good basis in bone as well as peripheral nerve histology.

Learning objectives and outcomes:

The student will be able to:

- 1- recognize and predict the way by which the injured tissue will regenerate or heal.
- 2- Also the type of healing will depend on the injury whether it is incision or
- 3- excision, clean or septic injury.
- 4- This is also applicable in repair of bone fracture, the student will be aware
- 5- of the factors controlling bone repair, the steps of this repair and the complications which may occur during repair.
- 6- The student will be aware of the factors controlling peripheral nerve repair,

7- the steps of this repair and the complications which may occur during this repair. The student has to differentiate between central nervous system repair and that of the peripheral nerves.

Molecular Pathology:

Prerequisites: the student should have a good knowledge about the genomic structure in histology and biochemistry.

Learning objectives and outcomes:

The student will be able to:

1. Define Oncogenes and tumor suppressor genes and enumerate some examples
2. List the factors Regulating cell cycles
3. Explain molecular basis of carcinogenesis
4. Describe mode of inheritance of different familial tumors
5. State hereditary predisposition of cancer in families
6. Classify of common types of familial cancers

Bacterial infections:-

Prerequisites: The student should have a good basis in immunology and general bacteriology.

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Differentiate between the different types of bacteria depending on its virulence, mode of infections and its pathological effect on the different body organs (whether it is macroscopically or microscopically).
2. Compare between the result of invasion of the blood by bacteria.
3. Describe the effects of bacteraemia, septicaemia, pyaemia, sapraemia or toxaemia.on the different body organs.

PAHTOLOGICAL DEPOSITS:

- Amyloid deposits
- Pathological calcificatins
- Pathological pigmentations

2.5.1 In amyloid deposits:

Prerequisites: The student should have a good basis in immunology and connective tissue histology (collagen and reticulin fibres distribution).

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Identify the different types of amyloidosis (classification), the causes of its deposition and its distribution in the different body organs.
- 2- Describe the macroscopic appearance as well as the histopathological appearance and the distribution of this abnormally formed protein in the different body

organs by examining the involved organs under the microscope in the histopathology lab.

3- Diagnose amyloidosis during life and in vitro.

In Pathological calcification:

Prerequisites: The students should have a good basis about calcium distribution and metabolism in physiology and biochemistry..

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Differentiate between the different types of abnormal calcification (Dystrophic calcification, metastatic calcification and stone formation).
2. Identify abnormal calcification in tissues both microscopically and macroscopically in the pathology museum.

Pathological pigmentation:

Prerequisites: The student should have a good basis in tyrosine and bilirubin metabolism, in biochemistry.

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Differentiate between Exogenous pigmentation and endogenous pigmentation as well as parasitic pigmentation.
2. Identify the distribution of the deposition of these abnormally (either excessively or diminished) formed pigments on the different body organs both by histopathological and naked-eye appearance and its effects on the patient.

Inborn errors of metabolism:

Prerequisites: The students should have a good basis in lipid and carbohydrate metabolism and their storage in biochemistry.

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Identify the metabolic disorder of lipid metabolism (hypercholesterolaemia, Neimann Pick disease) and the effect of its deposition in the different body organs.
- 2- Describe the metabolic disorder of glycogen metabolism (Gaucher's disease, Pompe's disease) and the effects of its deposition in the different body organs.

Circulatory disturbances:

Active hyperaemia and passive hyperaemia (congestion):

Prerequisites: The students should have a good basis factors controlling diffusion and perfusion of the blood (arterial and venous) to the tissue in the course of physiology.

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Identify and differentiate between Active hyperaemia and passive hyperaemia

2- enumerate many examples of different diseases having hyperaemia or congestion.

Thrombosis:

Prerequisites: The students should have a good basis in blood constituents in Histology and blood coagulation in physiology.

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Define what is thrombosis, causes of its formation, sites of its deposition .
- 2- Describe the mode of formation of each type,.
- 3- Enumerate the effects (different pathological lesions) of each on different organs if they are formed inside its vasculatures and their fate in the body.

Embolism:-

Prerequisites: The students should have a good basis in blood constituents in Histology and blood haemostasis in physiology.

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Identify embolism, its different types, causes of its formation, sites of its deposition and its effects as well.
- 2- Describe disseminated intravascular coagulopathy; its causes, effects and the mechanism of formation and hints about its management.

Ischaemia and Infarction:-

Prerequisites: The students should have a good basis about factors controlling diffusion and perfusion of the blood (arterial and venous) to the tissue in the course of physiology.

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Outline the relationship between the two terms
- 2- Identify the different types of infarctions (pale and red) both macroscopically and microscopically.

Gangrene:-

Prerequisites: The students should have a good basis about factors controlling diffusion and perfusion of the blood (arterial and venous) to the tissue in the course of physiology and the different types of bacteria (pathogens and non- pathogens) in the course of microbiology.

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Identify gangrene and its etiology.
2. Differentiate between types of gangrene,

Oedema:-

Prerequisites: The students should have a good basis about factors controlling diffusion and perfusion of the blood (arterial and venous) to the tissue in the course of physiology.

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Identify cases of Oedema and
2. Explain the causes and mechanisms of formation of this oedema fluid whether it is localized or generalized.

Haemorrhage:-

Prerequisites: The students should have a good basis about the physiologic factors which arrest haemorrhage (haemostasis).

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Identify the causes of Haemorrhage, recognize its different types whether it is external or internal,
- 2- She has to be able to predict its effects on the body parameters (heart rate, blood pressure, cardiac output and venous return).

Shock:-

Prerequisites: The students should have a good basis about factors controlling diffusion and perfusion of the blood (arterial and venous) to the tissue in the course of physiology.

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Describe this very important clinical subject, its definition, clinical picture, different causes, types and its pathogenesis as well as postmortem picture in the different body organs.

Granulomas:- Tuberculosis, Syphilis & Leprosy.

2.8.1 Tuberculosis:-

Prerequisites: The students should have a good basis in immunology about delayed type hypersensitivity reaction and granuloma formation. Good basis in bacteriology of Mycobacterium tuberculosis and bovis organisms.

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- The student will be aware of the pathologic basis of this disease, its reaction inside the different body organs and its microscopic and gross picture.
- 2- Besides, she will examine the lesions in the practical classes both microscopically and macroscopically.
- 3- Explain the effect of the causative organisms which have a direct relationship with its pathogenesis in the human body.

4- Discuss the complications of this disease.

Syphilis :-

Prerequisites: The students should have a good basis in immunology about delayed type hypersensitivity reaction and granuloma formation. Good basis in bacteriology of *Treponema pallidum* spirochaetes

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- State the pathologic basis of this disease, its reaction inside the different body organs and its microscopic and gross picture.
- 2- Describe the effect of the causative organisms which have a direct relationship with its pathogenesis in the human body.
- 3- Explain the different stages of syphilis, complications of this disease and its effects on the different internal organs (the cardio-vascular and the nervous systems).
- 4- Explain congenital syphilis.

Leprosy:-

Prerequisites: The students should have a good basis in immunology about delayed type hypersensitivity reaction and granuloma formation. Good basis in bacteriology of *Mycobacterium lepra* organisms.

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Describe the pathologic basis of this disease, its reaction inside the different body.
- 2- Explain the effect of the causative organisms which have a direct relationship with its pathogenesis in the human body and its main two types
- 3- Identify the basic histopathological reaction of the two types of leprosy (Lepromatous and tuberculoid) mainly, and recognize the different macroscopic and histopathological reactions in the body organs.

Parasitic Diseases:-

Bilharziasis, Amoebiasis & Filariasis.

Prerequisites: The students should have a good basis in immunology about delayed type hypersensitivity reaction and granuloma formation in parasitic diseases. Good basis in parasitology about the relevant parasites and its life cycle in the body

Learning objectives and outcomes:

In this topic, the student will be able to:

- 1- Describe the pathologic basis of this disease, its reaction inside the different body organs and its microscopic and gross picture.
- 2- Besides, the student will examine the lesions in the practical classes both microscopically and macroscopically.
- 3- Explain the complications of this disease.

Adaptation and Disturbances of growth:-

Prerequisites: The student should have a good basis in the structure, in the type of the cell depending on its ability of division (histology), function (physiology) and metabolism (biochemistry) of the cell.

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Define each term, the causes of excessive growth (hypertrophy and hyperplasia), the causes of decreased growth (agenesis, hypoplasia, aplasia and atrophy).
- 2- Distinguish between the disorders of differentiation of the cells (dysplasia and metaplasia) and will know the causes and examples of each type of disorder.

Neoplasia :-

Prerequisites: The student should have a good basis in the different types of the tissues and normal cell cycle (histology).

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Explain the different points related to neoplasia regarding its definition, aetiology, carcinogenesis, biology of tumour growth, its classifications to benign and malignant epithelial tumours, benign and malignant connective tissue tumours, grading and staging of cancer, spread of tumours (local, blood, lymphatic, transcoelomic and implantation), prognosis of tumours and its effects on the host.
- 2- Identify various types of benign and malignant tumours both by histopathological and by gross picture examination in the museum.

Immunopathology:-

Prerequisites: The student should have a good idea about the general features of the immune system and theories of tolerance in the course of immunology.

Autoimmune diseases:

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Define the different theories of immune tolerance.
- 2- Describe the different types of autoimmune diseases whether organ specific or organ non-specific.

Hypersensitivity diseases:

Learning objectives and outcomes:

In this topic, the student will be able to :

Identify the different types of hypersensitivity reactions as a result of immunologic tissue injury.

Immunodeficiency syndromes:

Learning objectives and outcomes:

In this topic, the student will be able to :

Differentiate between the different types of immunodeficiency whether congenital or acquired depending on the deficiency of the different elements of the immune system in the body with special reference to Acquired Immunodeficiency Syndrome (AIDS).

3- SYSTEMIC PATHOLOGY

Which is concerned with the specific responses of specialized organs and tissues to more or less well-defined stimuli.

During the course of this subdivision of pathology the student will be able to diagnose the different lesions in every subsequent system both in the museum (naked - eye appearance) and histopathologically (microscopically).

Disease of cardiovascular system:-

Prerequisites for studying diseases of the cardiovascular system: The students should have a good basis in anatomy, embryology, histology and physiology of the **cardiovascular system**.

Rheumatic fever:

Prerequisites: The students should have a good basis in anatomy, histology and physiology of the **heart**. The students should have also a good basis in the structure of and the body immune response to streptococcus haemolyticus organism.

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Define rheumatic fever and identify its clinical presentation.
- 2- Identify the main organs affected by this disease.
- 3- Explain the main basic reaction in rheumatic fever in the different body organs which are affected.
- 4- Describe the effects of rheumatic fever on the three layers of the heart (pancarditis).
- 5- Explain the haemodynamic effects of rheumatic fever in the heart; e.g. endocarditis (mural → Mc Callum's patches, valvular → mitral stenosis or incompetence, aortic stenosis or incompetence, myocarditis or fibrinous pericarditis).
- 6- State the John's major and minor criteria for diagnosis of rheumatic fever.
- 7- Describe the laboratory investigations for diagnosis of rheumatic fever (being minor criteria for diagnosis of rheumatic fever).

Diseases of the pericardium:

Prerequisites: The students should have a good basis in anatomy, and histology of the pericardium.

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Describe the different types of pericardial diseases: effusion, pericarditis should be clarified to the students.
- 2- State the causes of each type of pericardial effusion should be enumerated.
- 3- Explain the causes of pericarditis and its effects after healing and organization.

Diseases of the myocardium:

Prerequisites: The students should have a good basis about the anatomy and the histology of the cardiac muscle.

(a) Degenerative diseases of the myocardium:

Learning objectives and outcomes:

In this topic, the student will be able to :

Identify the different degenerative diseases of the myocardium: fatty change, amyloidosis, toxic myocarditis...

(b) Myocardial infarction:

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Explain the causes of myocardial infarction.
- 2- Describe the mechanisms of hypoperfusion / ischaemia of the cardiac muscle
- 3- Identify the site of myocardial infarction depending on the site of occlusion of the arterial supply.
- 4- Describe myocardial infarction both grossly, microscopically and even by laboratory investigations.
- 5- State the complications of myocardial infarction depending on the dating of myocardial infarction (student - centered problem solving).
- 6- In the practical session: at the end of the lab, the students will identify grossly the appearance of myocardial infarction and under the microscope the pattern of healing in myocardial infarction (myocardial scarring).

(c) Cardiomyopathy:

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Describe the different types of cardiomyopathy;
- 2- Describe its mode of inheritance whether autosomal dominant (familial), autosomal recessive or sex linked.
- 3- Explain the functional disorders of the cardiac chambers whether systolic or diastolic.

Diseases of the endocardium:

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1- Identify the different types of valvular diseases whether acquired or congenital and the haemodynamic disturbances and consequently, cardiac chambers changes in volume and size.
- 2- Differentiate between the different types of infective endocarditis
- 3- Describe the different types of vegetations on the cardiac valves whether infective or non-infective.

Congenital heart diseases:

Learning objectives and outcomes:

In this topic, the student will be able to :

1. State the congenital diseases of the heart, their causes and the incidence of each.
2. Describe the characteristics of each disease with special reference to the commonest disorders: anatomical site of the defect, haemodynamic disorders and the clinical effect of each anomaly (student-centered case presentation).

Heart failure:

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Define the term heart failure.
2. Explain the different types of heart failure.
3. State the causes of heart failure.
4. Describe the forward and backward pathologic effects of heart failure on the different body organs (brain, kidney, lung, liver....).

Tumours of the heart:

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Explain the different types of tumours commonly occurring in the heart.
2. State the types of heart tumours (benign and malignant).
3. Describe effects of heart tumours on the haemodynamics of the blood circulating in the heart.

Diseases of the vessels:

Prerequisites: The student should have a good basis in:

1. The different types of vessels (arteries, arterioles, meta-arterioles, capillaries, venules and veins).
2. The different types of arteries and its name (anatomy, histology).
3. The histologic structure of the arteries and veins (histology).
4. Metabolism of lipids (biochemistry).
5. Immunologic basis for autoimmune diseases (immunology).
6. Physiologic factors controlling the blood pressure (physiology).

Diseases of the arteries:

1. Degenerative diseases:

Arteriosclerosis: which is divided into :

a)Atherosclerosis (AS):

Learning objectives and outcomes:

In this topic, the student will be able to :

Identify AS and differentiate between it and the other causes of arteriosclerosis.

1. State its major and minor risky factors.
2. Explain the theories of its pathogenesis.
3. Describe the gross and microscopic appearance of the basic lesions of atherosclerosis as well as its complicated lesions.
4. Interpret the complications with special reference to the clinical presentation of the complicated cases of atherosclerosis (student- centered problem solving).
5. At the end of the practical session: at the end of the lab, the students will identify grossly and under the microscope, the appearance of atherosclerosis in the artery.

Monckberg's Calcific Sclerosis:

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Identify Monckberg sclerosis and differentiate between it and the other causes of arteriosclerosis.
2. Explain its pathogenesis.
3. Describe the gross and microscopic appearance of Monckberg sclerosis.

Arteriolosclerosis:

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Discuss the different types of arteriolosclerosis and the pathologic picture of these arterioles
2. Discuss the effects of arteriolosclerosis on the different organs with special reference to the kidney.

Hypertension:

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Define the terms primary, secondary, benign and malignant hypertension.
2. Interpret the different types of hypertension with the etiologic agent and the onset of the disease and the intensity of blood pressure.
3. Interpret between the different types of hypertension and its effects on the different body organs.
4. Explain the complications and clinical presentation of hypertension.

3. Aneurysms:

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Identify the term aneurysm and the student should be familiar with the different types of aneurysm and also be able to correlate each type with the etiologic agent and to the onset of the disease.
2. Differentiate between the different types of aneurysm and its effects on the surroundings
3. Explain the complications and clinical presentation of aneurysms.

Vasculitis:

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Differentiate between the different types of vasculitis and also state the etiologic agent.
2. Explain the different pathologic changes in each type of vasculitis
3. Describe the clinical presentation of each type of vasculitis depending on its effects on the different organs.

Diseases of the veins:

venous thrombosis:

Objectives:

1. Define thrombosis, state its causes and mode of its formation and sites of its deposition.
2. Describe the effects (different pathological lesions) of each on different organs if they are formed inside its vasculatures and their fate in the body.
3. Explain the complications and clinical presentation of venous thrombosis with special reference to Homan sign (student- centered problem solving).
4. At the end of the practical session: at the end of the lab, the students will identify grossly and under the microscope, the appearance of thrombus, its structure and the elements incorporated in its formation.

Varicose veins:

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Identify the term varicose vein and the student should be familiar with the predisposition and etiology of the disease.
2. Explain the clinical presentation and complications of varicose veins with special reference to varicose ulcers (student- centered problem solving).

Tumours of the vessels:

Learning objectives and outcomes:

In this topic, the student will be able to :

1. State the different types of tumours commonly arising in the arteries and veins.
2. State the types of vascular tumours (Hamartomas, benign and malignant).
3. Identify the tumours by gross and microscopic examination of each.
4. Describe effects of vascular tumours and its appearance.
5. At the end of the practical session: the students will identify the microscopic appearance of capillary and cavernous haemangioma as well as cavernous lymphangioma.

Diseases of Respiratory System:-

Prerequisites: The students should have a good basis about the anatomy the histology the respiratory system. and physiology of the respiration. Recall of knowledge that is covered in the course of tumours in general pathology is required.

Diseases of the nose, sinuses, tonsils and larynx

(**Inflammation (rhinitis, adenoides, rhinoscleroma and tonsillitis)**)

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Identify the different types of rhinitis (acute, chronic, allergic).
- 2- Identify & describe the slides of allergic rhinitis and rhinoscleroma microscopically.
- 3- Explain the pathologic changes of the tonsils in the different stages of tonsillitis and its local and systemic complication (student-centered problem solving).

b) Tumors of the upper respiratory tract:

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Identify the different stages of tumours arising from the nose, sinuses, pharynx and larynx.
2. Describe the pathologic picture of each type and differentiate between extrinsic and intrinsic carcinoma of the larynx.
3. Explain the different methods of spread of malignant tumours of the upper respiratory tract.

Diseases of the bronchi:

Learning objectives and outcomes:

In this topic, the student will be able to :

- 1 Identify the different types of bronchitis (acute and chronic).

2- Explain the different types of bronchial asthma (extrinsic and intrinsic), the cause (precipitating and exciting factors) the main immunologic reaction of each type, the gross and microscopic changes which occur in the bronchi in this disease, as well as its complications (student- centered problem solving).

3- Define bronchiectasis, state its etiology and explain its pathogenesis, pathologic picture and its complications.

4. State some examples of congenital causes of bronchiectasis as cystic fibrosis, and primary cilia dyskinesia.

4- Define emphysema, state its etiology and explain its pathogenesis, different types, pathologic picture and its effects on perfusion/ventilation (student- centered problem solving).

5- Identify & describe the slides of emphysema microscopically.

Diseases of the lung and alveoli:

Learning objectives and outcomes:

In this topic, the student will be able to :

1- State the different types of pneumonia depending on the etiological agent and anatomical distribution of the consolidation.

3- Explain the different stages of lobar pneumonia & its complications.

3- Distinguish differences between lobar pneumonia and bronchopneumonia.

4- Identify & explain the slides of pneumonia in its different stages microscopically.

Lung granulomas :

Prerequisites: The student should have a good basis in granuloma formation from general pathology course

Pulmonary tuberculosis:

The student should have a good basis in general about tuberculosis from general pathology course and bacteriology of the Mycobacterium tuberculosis from the course of microbiology.

Learning objectives and outcomes:

In this topic, the student will be able to

1- Describe the mode of infection, type of pulmonary T.B (primary or secondary), the sites of the lesions in the lung, its spread to the different organs in the body, and its complications (student- centered problem solving).

Sarcoidosis:

Prerequisites: The student should have a good basis in granuloma formation from general pathology course.

Learning objectives and outcomes:

In this topic, the student will be able to

1. State the aetiology, the pathologic picture, sites of the lesions in the lung and other sites, its spread to the different organs in the body, and explain its complications (student- centered problem solving).

3.2.7. Bilharziasis:

Prerequisites: The student should have a good basis in granuloma formation from general pathology course and life cycle of schistosomes in the human body.

Learning objectives and outcomes:

In this topic, the student will be able to

1. Explain the aetiology, the pathologic picture, sites of the lesions in the lung and its effects.

Pneumoconiosis:

Prerequisites: The student should have a good basis in granuloma formation from general pathology course and the occupational hazards in community medicine course.

Learning objectives and outcomes:

- 1- Define the pneumoconiosis and identification of each type depending on the causative agent.
- 2- Describe the morphologic changes in the lung in pneumoconiosis.
- 3- Explain the effect of pneumoconiosis on the heart.
- 4- Interpret between the clinical presentation with pneumoconiosis and its complications.

Vascular disorders:

Prerequisites: The student should have a good basis in factors controlling diffusion of blood across the arteriolar/ venular wall in physiology and congestion, ischaemia, infarction, embolism and thrombosis in the course of general pathology.

Chronic venous congestion of the lung:

Learning objectives and outcomes:

- 1- Explain the effect of mitral valve diseases (mainly stenosis) on the pulmonary circulation.
- 2- Describe the morphologic changes in the lung as a result of prolonged stasis of blood.
- 3- At the end of the practical session : the students will identify the microscopic appearance of the lung in chronic venous congestion.

Pulmonary embolism:

Learning objectives and outcomes:

- 1- Explain the effect of pulmonary embolism on the pulmonary embolism.
- 2- Describe the morphologic changes in the lung as a result of pulmonary embolism depending on the size of the embolism and its number as well the condition of the pulmonary circulation.

Pulmonary infarction

Learning objectives and outcomes:

- 1- Explain the effect of pulmonary embolism and thrombosis on the pulmonary circulation.
- 2- Describe the morphologic changes in the lung as a result of cut of the blood supply.

- 3- Interpret between the clinical presentation with pulmonary infarction (student- centered case study).
- 4- At the end of the practical session: the students will identify the microscopic appearance of the lung in pulmonary infarction.

Tumours of the lung:

Prerequisites: The student should have a good basis in the different types of tumours whether primary or secondary, benign or malignant.

Learning objectives and outcomes:

In this topic, the student will be able to

- 1- Identify the different types of lung tumours whether benign or malignant and whether primary or secondary.
- 2- Describe the morphologic appearance of bronchial adenoma and its clinical effects.
- 3- State the predisposing factors of bronchogenic carcinoma and its importance in the carcinogenesis of bronchial mucosa.
- 4- State the different gross and microscopic pictures of bronchogenic carcinoma.
- 5- Describe the methods and sites of metastasis of bronchogenic carcinoma (student-centered problem solving).
- 6- At the end of the practical session: the students will identify the microscopic appearance of bronchogenic carcinoma.

Diseases of the pleura:

Pleural effusion:

Learning objectives and outcomes:

In this topic, the student will be able to

- 1- State the different types of pleural effusion.
- 2- Identify the causes of pleural effusion and its appearance as well as its complications.

Pleural inflammation:

Learning objectives and outcomes:

In this topic, the student will be able to

1. State the different types of pleurisy
2. Identify the causative organisms of pleurisy, routes of infection and its appearance as well as its complications.

Pleural tumours:

Learning objectives and outcomes:

In this topic, the student will be able to

- 1- Identify the different types of pleural tumours whether benign or malignant
- 2- Explain the morphologic appearance of Pleural tumours and its clinical effects.
- 3- State the predisposing factors of pleural tumours and its importance in the carcinogenesis of pleural serosa.
- 4- State the different gross and microscopic pictures of Pleural tumours
- 5- Describe the methods and sites of metastasis of Pleural tumours

Epistaxis and Haemoptysis:

Learning objectives and outcomes:

In this topic, the student will be able to

Identify the lesion by definition, its causes, whether systemic or general (student-centered problem solving)

3.3.Diseases of the Urinary System:-

Prerequisites: The student should have a good basis in:

1. The anatomy of the urinary system (kidney, ureters and urinary bladder).
2. The histologic structure of the kidney (light and electron microscopy of the glomerulus), the ureter and urinary bladder.
3. The embryologic development of the urinary system.
4. Immunology and tissue reaction to the various injurious agents.
5. The physiology of the kidney.
6. The biochemistry of renal function tests.

Congenital anomalies of the urinary system:

Learning objectives and outcomes:

In this topic, the student will be able to

1. State and describe the different congenital anomalies which can arise during the development of the urinary system.
2. Interpret between the clinical presentation and each type of the congenital anomalies as well as the associated anomalies in the other systems.
3. Explain the complications which may arise as a result of these congenital anomalies.

Diseases of the glomeruli:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Explain the knowledge of general immunologic reactions of the body to the injurious agents.
2. Differentiate between the different types of glomerular injury (glomerulonephritis) depending upon: the nature of the antigen and its origin, the size of the immune complex, the site of its deposition in the glomerulus and the type of the reaction which associate glomerular injury.
3. State the different morphologic patterns of glomerular injury (diffuse, focal, global, segmental).
4. Explain the pathologic picture of the kidney in each type of glomerulonephritis (gross, light, electron and immunofluorescence).
5. Describe the two clinical syndromes (nephritic and nephrotic) which associate glomerulonephritis and explain the pathogenesis of their different signs and symptoms (student- centered problem solving).
6. Identify the possible fate of each type.
7. At the end of the practical session: the students will identify the gross and microscopic appearance of some types of glomerulonephritis.

Diseases of the tubules:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Identify the different causes of tubular damage ranging from degenerative changes to extensive tubular damage (necrosis).
2. Describe the different changes in the tubules as a result of its injury.
3. Describe the pathologic picture of the kidney in the different diseases (cloudy swelling, fatty change, ischaemic and toxic tubular necrosis).
4. Explain the mechanism of tubular necrosis in eclampsia of pregnancy.
5. Describe the clinical effects of tubular necrosis.
6. At the end of the practical session: the students will identify the microscopic appearance of the kidney in cloudy swelling and infarction.

Kidney infections:

Learning objectives and outcomes:

In this topic, the student will be able to

1. State the organisms which causes urinary tract infections, their sources of infection and the routes of infection of the urinary tract.
2. Explain the other predisposing factors for kidney infections.
3. Describe the pathologic picture of the kidney in the different types of infections (pyelonephritis, pyonephrosis, renal pyaemic abscess and renal carbuncle).
4. Explain the possible complications of spread of kidney infection.

Urinary tract obstruction:

Learning objectives and outcomes:

In this topic, the student will be able to

1. State the causes of urinary tract obstruction starting from the urethra up to the renal pelvis.
2. Explain the effects of obstruction on the urinary bladder (trabeculation, diverticulosis,.), ureters (hydroureter), renal pelvis and the kidneys (hydronephrosis).
3. Describe the possible complications of urinary tract obstruction.
4. At the end of the practical session: the students will identify the gross appearance of hydronephrosis, hydroureter and pyonephrosis.

3.3.6.Renal calculi:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Describe the biochemistry of the urine constituents, crystalloids/ colloids dissolution and the factors controlling it.
2. Explain the cause of renal calculi.
3. differentiate between the different types of renal calculi.
4. Describe each type of renal calculi.
5. Explain the possible effects and complications of renal calculi.

Kidney tumours:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Differentiate between the tumours which arise from the kidney whether benign or malignant.
2. Describe the morphologic appearance of renal cell adenoma and its clinical effects and clarify the points of differentiation between it and renal cell carcinoma.
3. State the predisposing factors of renal cell carcinoma and its importance in the carcinogenesis of renal tubules.
4. Describe the different gross and microscopic pictures of renal cell carcinoma
5. Explain the methods and sites of metastasis of renal cell carcinoma.
6. Explain the morphologic appearance of transitional cell carcinoma and its clinical effects and clarify the points of differentiation between it and renal cell carcinoma (age of the patient, its main presentation and its prognosis).
7. Describe the morphologic appearance of Wilm's tumour and its clinical effects and clarify the points of differentiation between it and renal cell carcinoma (age of the patient and its main presentation) (Student- centered problem solving).
8. Describe the methods and sites of metastasis of Wilm's tumour.
9. At the end of the practical session: the students will identify the gross and microscopic appearance of renal cell carcinoma, transitional cell carcinoma and Wilm's tumour.

Renal failure:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Explain renal failure depending upon the basic knowledge in renal physiology and biochemistry.
2. State the causes of both acute and chronic renal failure depending on the anatomical classification: pre-renal, renal and post-renal causes.
3. Describe the effects of uraemia on the different body organs

Diseases of the urinary bladder:

Inflammation:

Learning objectives and outcomes:

In this topic, the student will be able to

1. State the organisms which causes inflammation of the urinary bladder, their sources and the routes of infection of the urinary bladder.
2. Explain the other predisposing factors for urinary bladder infections.
3. Describe the pathologic picture of the urinary bladder in the different types of cystitis
4. Explain the possible complications of spread of urinary bladder infection.

Tumours of the urinary bladder:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Differentiate between the tumours which arise from the wall of the urinary bladder whether benign or malignant.
2. Explain the morphologic appearance of transitional cell papilloma and its clinical effects and clarify the points of differentiation between it and renal cell carcinoma.
3. State the predisposing factors of transitional cell carcinoma and its importance in the carcinogenesis of the bladder mucosa.
4. Describe the gross and microscopic pictures of transitional cell carcinoma
5. State the methods and sites of metastasis of transitional cell carcinoma.
6. At the end of the practical session: the students will identify the gross and microscopic appearance of transitional cell carcinoma of the urinary bladder.

Haematuria:

Learning objectives and outcomes:

In this topic, the student will be able to identify the lesion by definition, its causes, whether systemic or general (student-centered problem solving).

3.4.Diseases of Gastro Intestinal Tract:-

Prerequisites: The student should have a good basis in the structure, sites and relations of the salivary glands, structure of the gastrointestinal tract (Anatomy and Histology) as well as the course of digestion in physiology and the liver function tests in biochemistry. Recall of knowledge that is covered in the course of tumours in general pathology is required.

3.4.1.Diseases of the lip, mouth and tongue:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Identify the different types of inflammations which affect the lip, oral cavity and the tongue (with special reference to the ulcers of the tongue)
2. Explain the tumours which arise from the lips and tongue: their pathologic picture, sites and methods of spread to other sites.

3.4.2.Diseases of the salivary glands:

Inflammation of the salivary glands :

Learning objectives and outcomes:

In this topic, the student will be able to

1. Identify the organisms (bacterial and viral) which may reach the glands (Parotid), and routes of infection.
3. Describe the pathologic picture of the parotid glands and its complications.

Tumours of the salivary glands:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Differentiate between the tumours which arise from salivary glands whether benign or malignant.
2. Explain the pathologic picture of salivary gland tumours.
3. State the methods of spread and sites of metastasis of salivary gland tumours
4. At the end of the practical session: the students will identify the gross picture of pleomorphic adenoma of the parotid gland.
5. State the causes of enlargement of the parotid.

Diseases of the oesophagus:

Inflammation of the oesophagus (Oesophagitis):

Learning objectives and outcomes:

In this topic, the student will be able to identify the source of infection and other causes of inflammation with special reference to reflux oesophagitis and Barret's oesophagus.

Hiatus hernia:

Learning objectives and outcomes:

In this topic, the student will be able to describe the different types of hiatus hernia (sliding and rolling) and correlate each with the clinical presentation of the patient.

Tumours of the oesophagus:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Differentiate between the tumours which arise from the oesophagus whether benign or malignant with special reference to post-cricoid carcinoma and its predisposing factors.
2. Explain the pathologic picture of these tumours.
3. State the methods of spread and sites of metastasis of oesophageal tumours.
4. Describe the clinical presentation of the patients with oesophageal tumours.

Diseases of the stomach:

Gastritis:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Identify the different types of gastritis (acute and chronic).
2. State the causes of gastritis and the pathogenesis of gastritis in each.
3. Differentiate between acute gastric erosion in acute gastritis with gastric ulcers.
4. Describe the pathologic picture of acute gastritis, chronic Helicobacter associated gastritis and non-Helicobacter associated gastritis and its complications.

Peptic ulcer:

Learning objectives and outcomes:

In this topic, the student will be able to

1. State the sites of peptic ulcer (lower end of oesophagus, stomach, duodenum, Meckel's diverticulum and gastroenterostomy operations).
2. Explain the pathogenesis of peptic ulcers (gastric and duodenal).
3. Describe the pathologic picture of peptic ulcers (gastric and duodenal).
4. Explain the effects and complications of peptic ulcer.
5. Distinguish between the type of peptic ulcer with the clinical picture of the patient(Student- centered problem solving).
6. At the end of the practical session the student will be able to identify the different pictures of peptic ulcer in the stomach.

Tumours of the stomach:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Distinguish between the tumours which arise from the stomach whether benign or malignant and mention its predisposing factors.
2. Describe the pathologic picture of these tumours.
3. State the methods of spread and sites of metastasis of gastric tumours.
4. Explain the clinical presentation of the patients with gastric tumours (Student-centered case presentation).
5. At the end of the practical session the student will be able to identify the gross pictures of gastric carcinoma.

Diseases of the small intestine:

Intestinal obstruction:

Learning objectives and outcomes:

It is further divided according to its onset into acute and chronic intestinal obstruction:

1. Acute intestinal obstruction:

The student should be able to identify its causes, types (simple, strangulation, intussusception, volvulus and Mesenteric vascular occlusion) and complications. The student should correlate this condition with the clinical picture of the patient. At the end of the practical session the student will be able to identify the effect of mesenteric vascular occlusion on the intestinal loops.

2. Chronic intestinal obstruction:

The student should be able to identify its causes, types and complications. The student should correlate this condition with the clinical picture of the patient (Student- centered problem solving).

Inflammation of the small intestine:

Acute suppurative appendicitis:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Identify the source of infection, the causative organisms and other predisposing factors of acute suppurative appendicitis (obstruction and ischaemia).
2. Describe the pathogenesis of acute suppurative appendicitis and its different stages (types).
3. Describe the pathologic picture of this condition in its various stages.
4. Describe the pathological complications of acute suppurative appendicitis.
5. Interpret the disease and its complications with the clinical presentation of the patient (Student- centered problem solving).
7. At the end of the practical session the student will be able to identify the gross and microscopic pictures of acute suppurative appendicitis as well as its complications (ileocaecal mass).

Typhoid fever:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Identify the causative organisms (salmonella typhi and paratyphi) with recall to the microbiology, the source of infection.
2. Explain the pathogenesis of typhoid fever in its different stages.
3. Describe the pathologic picture of this condition in its various stages.
4. Describe the pathological complications of typhoid fever and its effects on the different body organs.
5. Interpret the disease and its complications with the clinical presentation of the patient (Student- centered problem solving).

Tuberculosis of the small intestine:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Identify the causative organisms (Mycobacterium bovis), the type (whether primary or secondary), source of infection (exogenous or endogenous).
2. Explain the pathogenesis of intestinal tuberculosis with recall to this topic from the general course.
3. Describe the pathologic picture of intestinal tuberculosis in its two types.
4. Describe the pathological complications of intestinal tuberculosis and its spread to the different body organs.
5. Interpret the disease and its complications with the clinical presentation of the patient (Student- centered problem solving).

Inflammations of the large intestine

- **Amoebic dysentery;**
- **Bacillary dysentery;**

Learning objectives and outcomes:

In this topic, the student will be able to

- 1- Differentiate between the two lesions regarding the etiology and pathogenesis, gross features, microscopy and complications.
- 2- Explain the condition of amoebic liver abscess, its gross picture and clinical presentation.

Idiopathic Inflammatory bowel diseases:

Learning objectives and outcomes:

In this topic, the student will be able to

- 1- Identify ulcerative colitis and crohn's disease.
- 2- Differentiate between the two lesions regarding the etiology and pathogenesis, sites (anywhere in the intestine), gross features, microscopy and complications.

Diverticula of the intestine:

Learning objectives and outcomes:

In this topic, the student will be able to

- 1- Identify intestinal diverticulosis, whether it is true or false and differentiate between congenital and acquired.
- 2- Identify Meckel's diverticulum and the complications which may arise in its presence.
- 3- At the end of practical session, the student will identify Meckel's diverticulum in the museum.

Tumours of the intestine:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Differentiate between the different types of tumours which arise from the small and large intestine whether benign or malignant with special reference to carcinoid tumours and carcinoid syndrome.
2. Describe the pathologic picture of these tumours.
3. State the methods of spread and sites of metastasis of these tumours.

Megacolon:

Learning objectives and outcomes:

In this topic, the student will be able to identify the site of the lesion, its cause and its effects

Haemorrhoides (piles):

Learning objectives and outcomes:

In this topic, the student will be able to identify the lesion by definition, its causes, types as well as its complications.

Bleeding from the gastrointestinal tract:

Learning objectives and outcomes:

In this topic, the student will be able to identify the lesion by definition, its causes, its types depending on its site of origin (haematemesis, melena and bleeding per rectum).

3.4.7. Diseases of the liver:

Prerequisites: The student should have a good knowledge about the liver in anatomy, histology and biochemistry. Also good basic information about the causative organisms of inflammatory diseases involving the liver (hepatitis virus, amoeba...) from the microbiology and parasitology courses.

Liver necrosis:

Learning objectives and outcomes:

In this topic, the student will be able to identify the lesion by definition, its causes, its types depending on its site in relation to the hepatic lobule (focal, zonal or massive).

Acute viral hepatitis:

Objectives: The student should be able to:

1. Identify the lesion by definition, its causes and differentiate between its different types (A,B,C,E,...G) regarding its mode of infection and the presence or absence of the carrier state and the complications.
2. Describe the basic pathological reactions in the liver both in acute and chronic hepatitis.
3. Explain the effects, complications and clinical picture of viral hepatitis.

Liver cirrhosis:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Define the condition explaining the changes which occur in the liver in this condition.
2. Describe the pathologic features of liver cirrhosis in general.
3. Differentiate between the different types of liver cirrhosis depending on the etiology and morphology (size of the nodules).
4. Explain in detail the commonest types of cirrhosis.
5. Differentiate between the effects of liver cirrhosis with the clinical presentations (student- centered problem solving).
6. At the end of the practical sessions the student should be able to identify the microscopic picture of biliary and portal cirrhosis.

Liver abscess:**Learning objectives and outcomes:**

In this topic, the student will be able to state the different causes of liver abscess and its morphologic picture.

Tumours of the liver:**Learning objectives and outcomes:**

In this topic, the student will be able to:

1. Differentiate between the tumours which arise from the liver whether benign or malignant and whether primary or secondary.
2. Explain the morphologic appearance of hepatocellular carcinoma and its clinical effects.
3. State the predisposing factors of hepatocellular carcinoma and its importance in the carcinogenesis.
4. Describe the different gross and microscopic pictures of hepatocellular carcinoma.
5. Explain the methods and sites of metastasis of hepatocellular carcinoma.
6. At the end of the practical session: the students will identify the microscopic appearance of hepatocellular carcinoma.

Jaundice:**Learning objectives and outcomes:**

In this topic, the student will be able to

1. Explain the metabolism and fate of bilirubin in the body .
2. Identify the different types of jaundice regarding its causes, changes in the blood and pathologic features.

Hepatic failure:**Learning objectives and outcomes:**

In this topic, the student will be able to

1. State the causes of hepatic failure.
2. Describe the pathologic features of hepatic failure.

Diseases of the gall bladder:

Prerequisites: The student should have a good knowledge about the gall bladder in anatomy, histology. Also good basic information about the causative organisms of inflammatory diseases involving the gall bladder (bacteria, amoeba...) from the microbiology and parasitology courses.

Acute and chronic cholecystitis:**Learning objectives and outcomes:**

In this topic, the student will be able to:

1. Explain the causes of this condition.
2. Describe the pathological features and complications of cholecystitis.
3. At the end of the practical session the student should identify the different types of cholecystitis.

Cholesterolosis of the gall bladder:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Describe the pathologic picture and associations of this condition as a result of disturbance of cholesterol metabolism.

Gall stones:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Explain the knowledge of biochemistry of the bile constituents, crystalloids / colloids dissolution and the factors controlling it.
2. Describe the cause of biliary calculi.
3. Differentiate between the different types of biliary calculi.
4. Describe each type of biliary calculi.
5. Explain the possible effects and complications of biliary calculi.
6. At the end of the practical session the student should identify the different types of biliary calculi.

Tumours of the gall bladder:

Learning objectives and outcomes:

In this topic, the student will be able to

1. State the tumours which arise from gall bladder whether benign or malignant.
2. Explain the morphologic appearance of gall bladder tumours and its clinical effects.
3. Describe the methods and sites of metastasis of carcinoma of the gall bladder.

Diseases of the pancreas:

Prerequisites: The student should have a good knowledge about the pancreas histology and relations in anatomy.

Acute haemorrhagic pancreatitis:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Explain the causes and pathogenesis of this disease.
2. Describe the pathologic features of the pancreas as well as its complications including chronic pancreatitis.

Tumours of the pancreas:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. State the malignant tumours which arise from the pancreas whether carcinoma of the head or the body or tail of the pancreas.
2. Discuss the morphologic appearance of this tumour and its clinical effects.
3. Discuss the methods and sites of metastasis of this tumour.

Diseases of the peritoneum:

Prerequisites: The student should have a good knowledge about the peritoneum histology and relations in anatomy.

Suppurative peritonitis:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Identify the causes and sources of infection of this disease.
2. Describe the pathologic features of the peritoneum as well as its complications.

Tuberculous peritonitis:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Identify the causes and sources of infection of this disease.
2. Describe the pathologic features of both dry and wet (ascitic) type of tuberculous peritonitis as well as its complications.

Other types of peritonitis:

1. Sterile peritonitis.
2. Rheumatic peritonitis.

Ascitis:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Identify ascitis by definition.
2. State the causes of both transudative and exudative ascitis.
3. Describe the pathologic features of both dry and wet (ascitic) type.

Tumours of the peritoneum:

Learning objectives and outcomes:

In this topic, the student will be able to

1. State the tumours which arise from the peritoneum whether benign or malignant and whether primary or secondary.
2. Discuss the morphologic appearance of tumours of the peritoneum.
3. Discuss the sources of secondary tumours the peritoneum.

3.5.Diseases of male genital system:-

Prerequisites: The student should have a good knowledge about the male genital system in anatomy, embryology and histology. Also good basic information about the causative organisms of inflammatory diseases affecting this system from the microbiology and parasitology courses. Recall of knowledge from the course of tumours in general pathology is required.

Congenital anomalies

Learning objectives and outcomes:

In this topic, the student will be able to

1. Identify the congenital diseases affecting this system (phimosis and cryptorchidism) by definition.
2. Explain the clinical importance of these lesions, its causes if possible and its complications

Inflammations:

Gonorrhoea:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Identify the lesion by definition, its causes, its mode of infection and the complications.
2. Describe the basic inflammatory reaction and pathologic picture in the urethra mainly.

Other Infections (Specific and Non-specific) :

Learning objectives and outcomes:

In this topic, the student will be able to

1. Describe the different types of infections which affect this system a) Non-specific: Balanitis, Acute and chronic prostatitis, Acute epididymitis and orchitis, endemic funiculitis)
 - b) Tuberculosis: tuberculous epididymitis
 - c) Syphilis: Syphilitic orchitis
 - d) Filariasis: Elephantiasis and funiculitis.
 - e) Bilharziasis: Orchitis, funiculitis and epididymitis.
 - f) Mumps: Orchitis.

Considering the following points:

- a) Basic pathologic reactions and the pathologic features of each.
 - b) Site of the main lesion.
 - c) The residual effect and the complications of the lesion.

Nodular hyperplasia of the prostate:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Identify the lesion by definition, its causes, and its incidence.
2. Describe the pathologic picture in the prostate.
3. Explain the effects and the complications of this lesion.
4. Interpret these effects with the clinical picture (student- centered case study).
5. At the end of the practical session: the students will identify the gross and microscopic appearance of Nodular hyperplasia of the prostate.

Tumours of the testis

Learning objectives and outcomes:

In this topic, the student will be able to

1. Identify the different types of testicular tumours whether benign or malignant and whether primary or secondary.
2. State the predisposing factors of testicular tumours and its importance in the carcinogenesis.
3. Describe the different gross and microscopic pictures of testicular tumours .
4. Describe the methods and sites of metastasis of testicular tumours (student-centered problem solving).

Carcinoma of the prostate:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Identify the different types of prostatic tumours whether benign or malignant.
2. Describe the pathologic pictures of prostatic carcinoma.
3. Describe the methods and sites of metastasis of prostatic carcinoma.

Tumours of the penis:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Identify the different types of tumours of the penis whether benign or malignant.
2. Describe the pathologic pictures of penile carcinoma (squamous cell carcinoma).
3. Describe its methods and sites of metastasis.
4. In the practical session the student will identify the lesion grossly.

Hydrocele, Haematocele, Chylocele and Varicocele:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Identify these different lesions by definition.
2. State the causes of each.
3. Describe the effects of these lesions through case study presentations.

3.6. Diseases of Female Genital System:-

Prerequisites: The student should have a good knowledge about the female genital system in anatomy, embryology, histology and physiology reproduction. Also good basic information about the causative organisms of inflammatory diseases affecting this system from the microbiology and parasitology courses. Recall of knowledge that are covered in the course of tumours in general pathology is required.

Terminal objectives: The student will be aware of the pathologic lesions of this system which is basic as an introduction to the clinical cases of gynecology.

Inflammations:

Gonorrhoea:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Identify the lesion by definition, its causes, its mode of infection and the complications.
2. Describe the basic inflammatory reaction and pathologic picture in the urethra, vagina, cervix, endometrium and fallopian tubes.

2. Other Infections (Specific and Non-specific) :

Learning objectives and outcomes:

In this topic, the student will be able to:

- 1- Determine the different types of infections which affect this system
 - a) Non-specific: cervicitis, endometritis with special reference to puerperal sepsis.
 - b) Tuberculosis: tuberculous endometritis
 - c) Syphilis: chancre on the external genitalia.
 - d) Filariasis: Elephantiasis of the external genitalia.
 - e) Bilharziasis: bilharzial endometritis.
 - f) Mumps: oophritis.
- considering the following points:
- a) Basic pathologic reactions and the pathologic features of each.
 - b) Site of the main lesion.
 - c) The residual effects, and the complications of these lesions.

The menstrual cycle

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Determine and date the cyclic endometrial changes in the different stages of the cycle to be able to determine the hormonal disturbances by microscopic examination of the endometrium.
2. At the end of the practical session, the student will differentiate between the proliferative and secretory stages by microscopic examination of the endometrium.

Endometrial hyperplasia:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. State the causes of this disease.
2. Describe the different pathologic picture of the uterus in this disease.
3. Explain the effects and complications of Endometrial hyperplasia on the patient.

Adenomyosis and endometriosis:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Identify and differentiate between these two lesions.

2. Explain the pathogenesis of endometriosis.
3. Describe the pathologic picture of each disease.
4. Discuss the effects and complications of each disease on the patient.

Tumours:

Prerequisites: The student should have a good basis in the different types of tumours whether primary or secondary, benign or malignant.

Objectives: the student should be able to:

1. Identify the different types of tumours in the female genital tract (Vulva, Vagina and Uterus) whether benign or malignant and whether primary or secondary.
2. Discuss the morphologic appearance of each and its clinical effects.
3. State the predisposing factors of uterine and cervical carcinoma and its importance in the carcinogenesis.
4. Describe the methods and sites of metastasis of each malignant tumour (student-centered problem solving).
5. At the end of the practical session : the students will identify the pathologic picture of uterine tumours.

Diseases of the ovary:

1. Ovarian lesions:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Identify the different types of ovarian cysts whether non-neoplastic (follicular cysts, corpus luteum cyst, theca lutein cyst and endometrial chocolate cyst) or neoplastic and whether benign or malignant.
2. Explain the morphologic appearance of each and its clinical effects.
3. Describe the methods and sites of metastasis of each malignant tumour (student-centered problem solving).
4. At the end of the practical session: the students will identify the gross picture of ovarian cysts.

Tumours of the placenta:

- Vesicular Mole
- Choriocarcinoma

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Identify these types of tumours in the placenta.
2. State the predisposing factors of tumours in the placenta and its importance in the carcinogenesis.
3. Explain the morphologic appearance of each and its clinical effects.
4. Describe the methods and sites of metastasis of choriocarcinoma.
5. At the end of the practical session: the students will identify the pathologic picture of placental tumours.

Ectopic pregnancy:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Identify the suspected sites of ectopic pregnancy.
2. State the predisposing factors of this condition.
3. Explain the pathology of this disorder and its clinical effects.
4. In practical session, the student will identify tubal pregnancy

3.7 Diseases of the female breast:-

Prerequisites: The student should have a good knowledge about the breast in anatomy, embryology, histology and physiology of lactation. Also good basic information about the causative organisms of inflammatory diseases affecting this organ from the microbiology. Recall of knowledge that is covered in the course of tumours in general pathology is required.

Terminal objectives: The student will be aware of the pathologic lesions of this system which is basic as an introduction to the clinical cases of breast diseases.

Inflammations:

1. Mastitis:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Identify the lesion by definition, the causes of each (Acute mastitis, Chronic mastitis, mammary duct ectasia and traumatic fat necrosis.
2. Describe the basic inflammatory reaction and pathologic picture in each lesion.

2. Specific Infections :

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Determine the different types of infections which affect the breast: Tuberculosis: tuberculous mastitis.

c) Syphilis: chancre on the breast skin.

d) Filariasis: Elephantiasis of the breast.

e) Mumps: mastitis

Considering the following points:

a) Basic pathologic reactions and the pathologic features of each.

b) The residual effects, and the complications of these lesions.

Mammary cystic hyperplasia:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Identify the cause of this disease.
2. Describe the different pathologic picture of the breast in this disease.

3. In the practical class the student will identify the microscopic picture of mammary cystic hyperplasia

Tumours of the breast:

Prerequisites: The student should have a good basis in the different types of tumours whether benign or malignant from the knowledge acquired in the course of general pathology.

Learning objectives and outcomes:

In this topic, the student will be able to

1. State the predisposing factors of cancer breast and its importance in the carcinogenesis of breast ducts.
2. Identify the different types of tumours in the breast whether benign (duct papilloma and fibroadenoma) or malignant and whether primary (intraduct carcinoma, infiltrating duct carcinoma, lobular carcinoma) or secondary which is very rare.
3. Explain the morphologic appearance of each and its clinical effects.
4. Describe the methods and sites of metastasis of cancer breast (student- centered problem solving).
5. At the end of the practical session: the students will identify the pathologic picture of fibroadenoma of the breast and infiltrating duct carcinoma.

Diseases of endocrine glands:-

Prerequisites: The student should have a good knowledge about the anatomy, histology and physiology of the endocrine glands. Also good basic information about the inflammatory reactions affecting these glands from the general pathology course. Recall of knowledge that are covered in the course of tumours in general pathology and the course of immunology (autoimmune diseases) are required.

Diseases of the thyroid gland:

Thyroiditis

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Identify the lesion by definition, the causes of each (Acute thyroiditis, Giant cell thyroiditis, Hashimoto's thyroiditis and Riedel's struma)
2. Describe the basic inflammatory reaction and pathologic picture in each lesion.
3. Differentiate between Riedel's struma and cancer thyroid as it looks like in clinical presentation.

Goitre:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Identify the lesion by definition, the causes of each type.
2. Describe the pathologic picture in each lesion:
 - a) Simple goitre: Parenchymatous, Diffuse and Nodular.
 - b) Toxic goitre (Grave's disease).

3. Explain the clinical presentation for each and explain each finding.
(student- centered problem solving).
4. State the effects and complications of each type.
5. At the end of the practical session: the students will identify the pathologic picture of simple and toxic goitre as well.

Tumours of the thyroid gland:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Identify the different types of tumours in the thyroid whether benign (follicular; colloid, foetal, embryonal and Hurthle cell type and papillary adenoma or malignant and whether primary (papillary, follicular, anaplastic or medullary) or secondary which is very rare.
2. Explain the pathologic picture of each type and its clinical effects.
3. State the predisposing factors of cancer thyroid and its importance in the carcinogenesis of thyroid acini.
4. Describe the methods and sites of metastasis of cancer thyroid.
5. At the end of the practical session: the students will identify the gross picture of thyroid carcinoma.

Hypothyroidism:

Learning objectives and outcomes:

In this topic, the student will be able to:

Explain the physiology of thyroid glands the student should identify the clinical features of the patient in two diseases (cretinism and myxoedema).

Diseases of the parathyroid glands:

Hyperparathyroidism:

Learning objectives and outcomes:

In this topic, the student will be able to

1. Differentiate between the primary (idiopathic) and secondary types depending on the causes.
2. Identify the cause whether due to hyperplasia, adenoma or carcinoma and differentiate between each lesion.
3. Explain the effects of hyperparathyroidism on calcium metabolism and its distribution in the different body organs with special reference to the bone changes (Osteitis fibrosa cystica).

Hypoparathyroidism:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. State the causes and the effects of hypoparathyroidism (tetany) and state the types of tetany (latent and manifest) from the physiology course of hypoparathyroidism.

Diseases of the pituitary glands:

Pituitary necrosis:

Learning objectives and outcomes:

In this topic, the student will be able to state the causes of each type whether ischaemic or toxic to discuss the clinical effects of hypopituitarism on the patient.

□ **Pituitary tumours:**

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Describe the morphologic, molecular, and clinical features of pituitary adenomas, including:
 - a. gross and microscopic appearances of adenomas
 - b. manifestations related to mass effect
 - c. endocrine manifestations, especially those related to the production of:
 - 1) growth hormone
 - 2) ACTH
 - 3) prolactin
2. Describe the following causes of hypopituitarism:
 - a. pituitary adenoma
 - b. Sheehan syndrome
 - c. empty sella syndrome
3. State the causes and manifestations of the following posterior pituitary syndromes:
 - a. syndrome of inappropriate ADH secretion (SIADH)
 - b. diabetes insipidus
4. Explain the clinical and microscopic features of craniopharyngioma

Diseases of the adrenals:

Adreno-cortical hyperfunction:

Learning objectives and outcomes:

In this topic, the student will be able to enumerate the causes as well as the effects of adreno-cortical hyperfunction depending upon the type of the cell which are affected:

- a) Conn's syndrome.
- b) Cushing syndrome.
- c) Adrenogenital syndrome

Adrenocortical hypofunction:

1) Acute adrenal insufficiency :

2) Chronic Adrenal insufficiency (Addison's Disease) :

Learning objectives and outcomes:

In this topic, the student will be able to state the causes as well as the effects of adreno-cortical insufficiency.

Tumours of the adrenal gland:

1) Tumours of the adrenal cortex:

Learning objectives and outcomes:

In this topic, the student will be able to identify the benign (adenoma, fibroma, neurofibroma, lipoma....) and malignant (carcinoma) tumours regarding their morphology and spread.

Tumours of the adrenal medulla:

Learning objectives and outcomes:

In this topic, the student will be able to identify the benign and malignant (Neuroblastoma, ganglioneuroma, pheochromocytoma) tumours also the secondary which is more common than the primary from the breast, bronchogenic and malignant melanoma regarding their morphology and spread.

Diseases of the pancreas:

□ **Diabetes mellitus:**

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Explain Diabetes mellitus:
2. State the causes which would lead to absolute or relative deficiency of insulin.
3. Identify the different types of diabetes mellitus.
4. Explain the pathogenesis of Diabetes mellitus.
5. Describe the pathologic changes of the pancreas in each type.
6. Finally, to explain in detail the effects and complications of diabetes mellitus on the different body organs (kidney, cardiovascular system, retina, respiratory system, skin and peripheral nerves).

3.9. Diseases of Blood:-

Prerequisites: The student should have a good knowledge about:

1. Haemopoiesis, the different bone marrow stem cells in their different stages of maturation, the cytomorphology of the peripheral blood cells like red blood cells, white blood cells, platelets, erythroblastic series and megakaryocytes. All from the course of histology.
3. Metabolism of Vitamin B12 and Folic acid and hexose monophosphate shunt in the RBCs, molecular aspects of haemoglobin synthesis from the course of biochemistry.
4. Red cell production, destruction, response to loss of red blood cells from the course of physiology.

□ **Anaemias:**

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Describe the general clinical features of all types of anaemias.
2. Explain the classifications of anaemias (aetiologic and morphologic).
3. Describe the causes of anaemias, the effects of each type on the morphology of the different body organs.
4. Explain the changes in the blood film, X-ray film of the bones
5. Describe the complications of anaemias.

○ **Leukaemias:**

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Define leukaemia, its causes and its different types.
2. Differentiate between acute and chronic leukaemia.
3. Differentiate between chronic myeloid and chronic lymphatic leukaemia.
4. Explain the peripheral blood film in each type of leukaemia.
5. Describe the effects of each type on the different body organs.
6. Explain the different clinical findings in cases of leukaemia (student -centered case study).
7. In the practical session the student will examine the liver microscopically in both chronic myeloid and chronic lymphatic leukaemia.

Multiple myeloma:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Cell of origin of this disorder.
2. Metastatic effects on the different body organs especially the bones and kidneys.

Haemorrhagic blood diseases:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Thrombocytopenia, its causes and effects of bleeding disorders.

Diseases of lymph nodes and spleen:-

Prerequisites: The student should have a good knowledge about:

1. The different bone marrow stem cells in their stages of maturation, the cytomorphology of all the white blood cells in the peripheral blood from the course of histology.
2. The different organs of the lymphatic system all over the body.
3. The lymph node histology review :B cell regions, T- cell regions and its site of origin.

□ **Benign Disorders of leukocytes and lymph nodes:**

leucopenia, leucocytosis, neutrophilia, agranulocytosis...

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Describe different types of leucocyte abnormalities and relate them to the body response to injury, exercise, bacterial and viral infections.
2. Differentiate between the benign and malignant lymphadenopathy.

□ **Malignant Disorders of the lymph nodes (Malignant lymphomas):**

□ **Hodgkin disease:**

Learning objectives and outcomes:

1. In this topic, the student will be able to:
2. Definition of Hodgkin disease and Reed-Sternberg cell as pathognomonic cell in Hodgkin disease.
3. Describe the different types of Hodgkin disease and correlate it with the clinical features.
4. Explain the different stages, of Hodgkin disease according to the clinical presentation.

□ **Non- Hodgkin lymphoma:**

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Describe the different classifications applied for Non- Hodgkin lymphoma depending upon the function, cell of origin (small B lymphocyte, small cleaved, large cleaved, small non-cleaved, large non- cleaved, immunoblast, plasmacytoid) and genotypic changes.
2. State the most accepted and used classification is the working formulation for clinical use: the concept of low grade, intermediate grade and high grade lymphomas.
3. State the most recent classification which is the REAL classification.
4. Describe the pathologic features of the lymph nodes in cases of lymphomas.

□ **Diseases of the spleen**

Learning objectives and outcomes:

In this topic, the student will be able to state the causes of splenomegaly as well as hypersplenism.

Diseases of Bones and Joints:-

Prerequisites: The student should have a good knowledge about:

1. The anatomy of the bones whether long or flat including the histologic structure of the different types of bone.
2. The histologic structure of the cartilage.
3. The anatomy and histology of the different types of joint as well.

□ **Bone fracture repair:**

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Differentiate between the different types of bone fractures (simple, compound, fissure or comminuted).
2. Explain whether the fractured bone is already healthy or diseased (pathologic fracture).
3. Explain the steps of healing of bone fracture.

4. Describe the factors that affect healing of bone fracture.
5. Describe the complications of healing of bone fracture.

□ **Inflammation of the bone:**

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Definition of osteomyelitis.
2. Explain the classifications of osteomyelitis depending upon the aetiological agent (non-specific, tuberculosis, sarcoidosis and syphilis)and the duration (acute and chronic).
 - Acute haematogenous osteomyelitis:(aetiology, pathogenesis, pathologic features and complications).
 - Acute non-haematogenous osteomyelitis (sources of infection and sites).
 - Chronic suppurative osteomyelitis (sources of infection, course with special reference to Brodie's abscess).

Tumours of bone:

Learning objectives and outcomes:

In this topic, the student will be able to:

- 1.State the tumours which arise from the bone and cartilage whether benign or malignant and whether primary or secondary (common)
2. Describe the pathologic picture of these tumours.
3. State the methods of spread and its sites of metastasis
4. Explain the clinical presentation of the patients (student- centered problem solving).
 - **Bone osteodystrophies:**
 1. Fibrous dysplasia.
 2. Paget's disease.
 3. Osteoporosis.
 4. Osteitis fibrosa cystica.
 5. Rickets.
 6. Osteomalacia.

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Identify the possible cause of each.
2. Describe the pathologic picture, effects and complications of each.

□ **Diseases of joints:**

1. Arthritis:

Objectives: The student will be able to:

1. Identify the different types of arthritis (acute, chronic: non-specific and specific).

2. Describe the pathologic picture of each type.
3. Explain rheumatoid arthritis, osteoarthritis and villonodular synovitis regarding its causes, pathogenesis, pathologic picture and its complications as well.

□ **Tumours of joints:**

Learning objectives and outcomes:

In this topic, the student will be able to describe the pathologic picture of malignant synovioma as well as its spread.

3.12. Diseases of Nervous System:-

Prerequisites: The student should have a good basis in the structure (anatomy and histology) of the nervous system (meningeal coverings, brain, spinal cord and peripheral nerves, ventricles and CSF secretion, circulation and drainage. Also good basic informations about the inflammatory reactions, which affect the nervous system from the general pathology course, are required. Recall of knowledge that are covered in the course of tumours in general pathology and the course of virology are required.

□ **Inflammatory Diseases:**

Learning objectives and outcomes:

In this topic, the student will be able to:

- 1- Differentiate between the different types of meningitis whether bacterial or viral depending upon the CSF laboratory examination and by the naked eye appearance and microscopic examination of the meninges (postmortem).
- 2- Describe the different types of brain infections; localized (brain abscess), diffuse (encephalitis): its causes, sources, pathogenesis, pathologic picture and complications.
- 3- Explain the different viral diseases of the nervous system (poliomyelitis, rabies and herpes zoster, Spongiform encephalitis) with special reference to the mode of infection and the pathologic features of Prion disease.
- 4- At the end of the practical session, the student will identify acute suppurative meningitis grossly.

□ **Vascular diseases of the nervous system:**

- a) **Intracranial haemorrhage:** meningeal and cerebral haemorrhage:

Learning objectives and outcomes:

In this topic, the student will be able to:

1. Explain the causes and their effects.
2. Identify cerebellar haemorrhage in the museum.

b) **Cerebral aneurysms:** Congenital, Mycotic, Arteriosclerotic and arteriovenous aneurysms:

Learning objectives and outcomes:

In this topic, the student will be able to explain the morphology and effects.

c) **Cerebral infarction:**

Learning objectives and outcomes:

In this topic, the student will be able to explain the causes and their effects.

d) **Hydrocephalus:**

Learning objectives and outcomes:

In this topic, the student will be able to :

1. Explain the synthesis, formation, circulation and drainage of cerebrospinal fluid.
2. Define the causes, types and effects of hydrocephalus.
3. At the end of the practical session, the student will identify Hydrocephalus grossly.

□ **Intracranial Tumours:**

Learning objectives and outcomes:

In this topic, the student will be able to:

1. State the classifications whether it is benign or malignant, primary or secondary.
2. Describe the pathologic picture of each, their effects as well as their sites of spread.
3. At the end of the practical session, the student will identify meningioma microscopically.

□ **Tumours of the peripheral nerves:**

Learning objectives and outcomes:

In this topic, the student will be able to:

1. State the classifications whether arising from the cranial nerves (schwannoma) or peripheral nerves (neuofibroma).
4. Describe the morphology of each and its effects on the surroundings.
5. Explain the clinical association e.g. Von-Recklinghausen disease of nerves.
6. At the end of the practical session, the student will identify schwannoma both grossly and microscopically.

□ **Peripheral neuritis:**

Learning objectives and outcomes:

In this topic, the student will be able to explain the causes of this common disease and its clinical picture.

METHODS OF TEACHING

The course of pathology consists of the followings:-

1. Lecturing program of 177 lectures of 60 minutes each (174 hrs) each distributed over the four semesters of the 1st and 2nd year.
2. Practical sessions of 33 sessions of 120 minutes each (66 hrs) also distributed over the two semesters of the 2nd year and divided into two main laboratories.
 1. **Museum for pathology specimens (Gross Specimens):-** This is to complement the teaching process of pathology with a sufficient number of specimens of different lesions from different body organs so as to help in understanding and retaining the information acquired in the lecture hall and to promote the student's interest in the field of pathology. These specimens are continuously collected from the different hospitals in UAE, most of them are post-operative specimens.
 2. **Histopathology Laboratory:-** Also it helps in application of what is acquired from the theoretical lectures. It is intended to be following every topic in these lectures. The students examine the lesions in about 75 slides of different lesions distributed all over the two semesters.

These practical classes will allow the student to be capable of diagnosis of the different lesions in the body organs both by the naked-eye appearance and by microscopic examinations.
3. **Teacher - centered tutorials:-** 30 tutorial sessions of 60 minutes each distributed all over the four terms, meant to identify areas of strength and weakness in the student's command of the subject and it also reinforce the student's understanding of the principles of pathology. It covers all the topics in the theoretical lectures.
4. **Students' centered seminars:-** About major topics integrated with other departments of basic sciences, each used for the preparation and presentation of seminars by the students.

Syllabus of Pathology

I- General Pathology:

1. **Cell Injury (degeneration) :-** Etiology, parenchymatous, connective tissue degenerations.
2. **Necrosis :-** Etiology, types, end-result.
3. **Apoptosis:** Etiology, types, end-result
4. **Inflammation:-** Etiology, vascular phenomenon, inflammatory exudate, chemotaxis, inflammatory cells, types of acute inflammation and end- result of inflammation.
5. **Repair and Healing:-** Types of cells in response to injury, steps of granulation tissue formation, Healing of wounds & its complications. Healing of bone fracture & its complications.
6. **Bacterial infections:-** Bacteremia, Toxemia, pyaemia and septicemia.

7. Pathological deposits:-

7.1.1 Amyloid deposits

7.1.2 Pathological calcification:- Dystrophic calcification, metastatic calcification, stone formation

7.1.3 Pathological calcification:- Dystrophic calcification, metastatic calcification, stone formation

8. Molecular Pathology:

a. Oncogenes, tumor suppressor genes

b. Regulation of cell cycles

c. Molecular basis of carcinogenesis

d. Mode of inheritance of different familial tumors

e. Hereditary predisposition of cancer in families

f. Classification of common types of familial cancers

9. **Circulatory disturbances:-** Hyperaemia, thrombosis, embolism, infarction, gangrene, oedema, haemorrhage, and shock.

10. **Granulomas:-** Tuberculosis, Syphilis, Leprosy, Rhinoscleroma, And Actinomycosis.

11. **Parasitic Diseases:-** Bilharziasis, Amoebiasis, Filariasis and Hydatid diseases.

12. **Adaptation and disturbance of Growth:-** Diseases which lead to excessive growth, disorders which lead to decrease growth, disorders of differentiation of cells.

13. **Neoplasm tumours:-** Definitions, classification, benign & malignant epithelial tumours, benign and malignant connective tissue tumours, spread of tumours, Prognosis of tumours.

14. **Immune response and hypersensitivity:** Immunopathology Types of hypersensitivity, Auto-immune diseases and Collogen diseases.

II- Systemic Pathology:

1. **Diseases of cardio-vascular system:-** Rheumatic fever, diseases of pericardium, myocardial infarction, diseases of endocardium, diseases of blood vessels e.g. hypertension, atherosclerosis, and various types of arteritis, diseases of veins (thrombosis and varicosities).

2. **Diseases of Respiratory System:-** Diseases of the nose (inflammations and Tumours), Diseases of adenoids and tonsils, Diseases of larynx (inflammation & Tumours), diseases of bronchi, Cystic fibrosis disease, Diseases of lung alveoli (pneumonias, occupational lung diseases, tumours), Diseases of the pleura, (inflammations and tumours, accumulations of fluid).

3. **Diseases fo Gastro- Intestinal Tract:-** Diseases of the mouth (Inflammations), Diseases of the tongue (ulcers and tumours), Diseases of the oesophagus, Diseases of the stomach, (types of gastritis, peptic ulcer, Tumours of the stomach), Diseases of Intestine (Inflammation, Parasitic infections, ulcers, tumours, and intestinal obstruction). Diseases of pancreas, Diseases of the peritoneum (peritonitis, and fluid accumulation). Diseases of the liver (types of hepatitis, liver cirrhosis,

suppuration in the liver, tumours, primary and secondary, jaundice). Diseases of the Gall Bladder (Inflammations, gall bladder stones).

4. **Diseases of the Urinary System:-** Diseases of Glomeruli (inflammation, Nephritic and Nephrotic syndrome), Diseases of the renal pelvis (Types of pyelonephritis), Tubular necrosis, Renal stones , Renal tumours, Renal Failure, Diseases of the Urinary Bladder (inflammations, stones and tumours).
5. **Male Genital System:-** Diseases of Prostate (Inflammations, and Hyperplasia), Tumours of the testis (Benign and malignant). Various types of coeles of the testis.
6. **Diseases of Female Genital System:-** Vulva, Vagina, and cervix (Gonorrhoea, other inflammations, and tumours), Diseases of the endometrium (peurpeural sepsis, endometriosis, endometritis & tumours, endometrial hperplasia), Diseases of the ovaries (inflammations, tumours , and non- neoplastic cysts). Diseases of the placenta (vascular, and tumours).
7. **Disease of the Female Breast:-** Inflammations (types of mastitis), Mammary hyperplasia, Tumours of the breast (Benign & malignant), Types of discharge from the nipple.
8. **Diseases of Endocrine System:-** Thyroid Gland (Goitre inflammation - Tumours), Pituitary Gland (Tumours, and syndromes), Diseases of adrenal and parathyroid gland (Hyperplasia, Tumours).
9. **Diseases of Blood:-** Anemias with its various types, Haemorrhagic blood diseases, Leukemias.
10. **Diseases of lymph nodes and spleen:-** Inflammation (Acute and Chronic), Lymphoma (types, classification, Causes of lymph node enlargement, Causes of splenomegaly).
11. **Diseases of Bones and joints:-** Type of osteomyelitis, Tumours of bone, Osteodystrophies, and Diseases of joints (inflammations and tumours).
12. **Diseases of Central Nervous System:-**
Diseases of meninges (various types of meningits, Tumours of the meninges), Cerebro-vascular diseases, Tumours of the brain, Viral infections, Demyelinating and Degenerative diseases of the brain), Peripheral neuritis.

The Evaluation Policy

1. The evaluation Policy is designed to assess the process of learning of every individual student
2. The Policy is designed to harmonize with the outlines of the evaluation policy of any other clinical faculty. The examination modes have to fit in harmony with the objectives of the undergraduate curriculum and the course of pathology.
3. The evaluation process should test all the knowledge, skills and attitude of the students.

Continuous evaluation:-

1- Seminar preparation and Student- centered presentation: to assess the ability of the student to prepare and interpret the various topics related to the different subjects covered by the basic medical sciences.

2- Mid-semester examination:

To assess teaching methods and to detect weakness of the students as early as possible.

3- Active class sharing :

To encourage the student to prepare and share in the class, to prepare her for oral assessment and to detect the difficult points to be explained in the different topics as well. It is done regularly in all the lectures covering all the courses of Pathology. The student is given an assignment to prepare and present in lecture as a case study to be discussed in lecture with her colleagues.

Final Examination of Pathology:-

The final examination is to be held as follows:

1. Written test:- Consisting of multiple choice., as well as account questions and lasting for 3 hours, including problem - solving questions.
2. Oral test:- On interview of the student by the lecturer in which the questions must cover all the parts given .
3. Practical examination:- In which the student has to diagnose and report different lesions in pathology both by microscopic examination of slides and by gross examination of the diseased organs in jars from the museum.
4. Case- based learning in group discussion during the practical classes

Distribution of Marks:-**Total mark is calculated from 220 marks**

Distributed as follows:

Distribution	First year 65 marks	Second year 155 marks		Total 220 marks
		first semester	second semester	
A) Year assessment (30%)	20 marks	25 marks	20 marks	65 marks
1- mid year	10	15	10	35
2- seminar	5	5	5	15
3- class sharing	3	3	3	9
4- attendance	2	2	2	6
B) Final (70%)	45 marks	55 marks	55 marks	155 marks
1- written	35	25	25	85
2- practical	--	20	20	40
3- oral	10	10	10	30
total	65 marks	80 marks	75 marks	220 marks

Mark scale is as follows:

60 – 64.9 % Pass

65 – 74.9 % Good

75 – 84.9 % Very Good

85 % and above Excellent.

References Text Books:

Cotran R.S., Kumar, V. and Robbins, S.L: Pathologic Basis of Disease: W.B. Saunders Company, Philadelphia, London, Toronto.

Walter J.B. and Israel, M.S: General Pathology Churchill Living-stone.

Study material includes also :

Handouts prepared in the department.

Atlas in practical : including the photographs of the slides and jars in pathology laboratory and museum.

TIME TABLE FOR PRACTICAL PATHOLOGY 2ND YEAR 2ND SEMESTER

Slides:1ST WEEK

Fatty Liver
Chronic Venous Congestion, Liver
Amyloidosis, Liver

Slides:.....2nd WEEK

Bilharzial Fibrosis, Liver
Chronic Myeloid Leukemia, Liver
Chronic Lymphoid Leukemia, Liver
Fibrinous peritonitis, Liver

Slides:3rd WEEK

Bilharzial Polyp, Colon
Adenoma, Intestine
Adenocarcinoma , Colon
Mucoid Carcinoma, Colon

Jars:

Chronic peptic Ulcer, Stomach
Malignant Ulcer, Stomach
Fungating Carcinoma, Stomach

Slides:4th WEEK

Acute suppurative, Appendicitis
Fibrinous peritonitis, Omentum

Jars:

Acute suppurative Appendicitis
Ileocaecal Mass
Intussusception, Ileum
Meckel's Diverticulum, Intestine
Mesenteric vascular occlusion, Intestine

Slides:5th WEEK

Portal Cirrhosis, Liver
Obstructive Jaundice, Liver
Hepatocellular Carcinoma, Liver

Jars:6th WEEK

Mucocoele of the Gall Bladder
Chronic Calculous Cholecystitis, Gall bladder
Pleomorphic Adenoma, Salivary gland
Fat Necrosis, Omentum
Infarction, Spleen

REVISION AND EVALUATION..... 7TH WEEK

Slides: 8TH WEEK

Osteoclastoma
Osteogenic Sarcoma

Jars:

Non-ossifying Fibroma, Bone

Slides: 9TH WEEK

Simple Colloid Goitre, Thyroid
Toxic Goitre, Thyroid

Jars:

Simple Colloid Goitre, Thyroid
Cancer, Thyroid

Slides: 10TH WEEK

Proliferative phase, Endometrium
Secretory phase, Endometrium
Adenocarcinoma, Uterus

Jars:

Multiple Fibroids, Uterus
Submucous Fibroid, Uterus
Endometrial Carcinoma, Uterus

Jars: 11TH WEEK

Vesicular Mole
Choriocarcinoma, Uterus
Hydrosalpinx, Fallopian Tube
Ectopic Gestation, Fallopian Tube
Congenital Anomaly, Foetus

Jars: 12TH WEEK.

Simple serous Cyst, Ovary
Mucinous Cystadenoma, Ovary
Hemorrhagic Cyst, Ovary
Mucinous Cystadenocarcinoma, Ovary
Krukenberg Tumor, Ovary
Dysgerminoma, Ovary

Slides: 13TH WEEK

Intracanalicular Fibroadenoma, Breast
Pericanalicular Fibroadenoma, Breast
Fibrocystic Changes of Breast

Jars:

Fibroadenoma, Breast
Fibro cystic Disease of Breast

Slides:14TH WEEK

Scirrhus Carcinoma, Breast
Encephaloid Carcinoma, Breast

Jars:

Carcinoma, Male Breast
Carcinoma, Female Breast

REVISION AND EVALUATION.....15TH WEEK.

Slides: 16TH WEEK

Nodular Hyperplasia, Prostate

Jars:

Carcinoma, Penis
Testicular Atrophy
Senile Nodular Hyperplasia, Prostate

Slides:17TH WEEK

Meningioma

Jars:

Anencephaly, Foetus
Hydrocephalus, Brain
Cerebellar Hemorrhage
Acute suppurative meningitis
Schwannoma

REVISION AND EVALUATION.....18TH WEEK

TOPICS FOR STUDENT ASSIGNMENT
Department of Pathology

ALIMENTARY SYSTEM:

Batch 16

1. Helicobacter pylori- gastric lesions	Mariam Salem, Khawla
2. Dysphagia- Oesophageal causes	Suhaila, Arwa
3. Plummer Vinson Syndrome	Farah, Zahra
4. Idiopathic inflammatory bowel diseases	Neveen, Bushra
5. Lab. investigations of Digestive system disorders	Dhelal, Eiman
6. Genetic abnormalities in GI malignancies	Enas, Alaa
7. Carcinoid tumours	Lateefa Shafar, Yusra
8. Hirschsprung Disease	Raabia Mir, Syeda, Saima
9. Intestinal obstruction	Hakima, Zainab
10. MALT lymphoma	Sadia, Batool
11. Liver cell failure	Khulood MN, Salwa
12. Budd Chiari syndrome	Noor MT, Fatima Mohd

TOPICS FOR STUDENT PRESENTATION -II

Department of Pathology

Batch :16

Group A

Group B

	<i>Group A</i>	<i>Group B</i>
Endocrine System: 1. Diseases of the Adrenal gland 2. Diseases of the Pituitary gland		
	Arwa Hasan	Nabras Mohd, Radhia R. A.
Female Genital System: 1. Pevic Inflammatory Disease 2. Cervical Intraepithelial Neoplasia- CIN 3. Carcinoma, Cervix 4. Endometrial hyperplasia Dysfunctional Uterine Bleeding 5. Endometriosis 6. Carcinoma, Endometrium 7. Ectopic Pregnancy; Gestational trophoblastic Diseases 8. Tumours of Ovary	Syeda Qurat	Nouf Mohamed
	Fatima Saeed	Asma Mohamed
	Muna Mohamed	Dalia K. Taha
	Dalal Matoonq	Rabia Shafi
	Nisreen Mohd	Hafeeza I.
	Zahra Mohamed	Lateefa Saeed
	Lamya Sabbagh, Farah Al Shawa	Khawla Yousuf, Maryam Salem

Male Genital System: 1. Testicular tumour 2. Hyperplasia and Carcinoma Prostate 3. Carcinoma Penis	Alaa Saleh	Afra Ahmed
	Saima Patel	
Bone: 1. Osteomyelitis 2. Benign Bone tumours 3. Osteoclastoma 4. Osteogenic Sarcoma 5. Diseases of joints-Rheumatoid arthritis and Osteoarthritis 6. Bone Osteodystrophies - Rickets Osteomalacia Osteoporosis - Pagets Dis., Fibrous Dysplasia	Nayla Zia	Marriam Nazir
	Suhaila Mohd	Sana Thara
	Khulood Salem	Alia Musabbah
	Dor Khatoon	Yasmine M.
	Raabia Mir	Nazneen H.
	San Qaiser	
	Ambreen F.	Mariam Saeed
Central Nervous System: 1. Cerebrovascular accidents 2. Infections of CNS, CSF examination 3. Hydrocephalus 4. CNS tumours		Sara Feddad
	Noor M. T.	
		Huda Abdellatif

EXAMPLES OF CASE-BASED LEARNING CANCER STOMACH

- **LEARNING OBJECTIVES:**

The student should be able to

1. interpret the findings in this disorder.
2. Describe the different pathologic pictures of this tumour.
3. Enumerate the different methods of spread of this tumour.

Case Study:

A 50-year-old man has had persistent nausea for 5 years with occasional vomiting. On physical examination there are no abnormal findings. He undergoes an upper GI endoscopy, and a small area of gastric mucosa is noted in the fundus which has loss of rugal folds. A biopsy reveals well-differentiated adenocarcinoma confined to the mucosa. An upper GI endoscopy performed 5 years previously showed a pattern of gastritis and microscopically there was chronic inflammation with the presence of *Helicobacter pylori*.

1. What are the risk factors for gastric carcinoma.
2. Describe the different pathologic picture of this tumour.
3. Enumerate the different methods of spread of this tumour.

CARCINOID TUMOUR

LEARNING OBJECTIVES:

The student should be able to

1. Interpret the clinical syndrome in association with carcinoid tumour.
2. Describe the pathologic picture of this tumour.

CASE STUDY:

A 67 years old male presented to the emergency room with severe bronchial asthma, cutaneous flushing and severe diarrhea.

His asthma was treated till his condition became stable.

History taken from the patient revealed that he has experienced abdominal pain, anorexia, weight loss, and fatigue for 2 years.

Endoscopic examination revealed mass arising from the colonic mucosa. Biopsy revealed the proliferation of sheets or small polyhedral cells separated by loose vascular stroma that show black to brown granules on silver staining.

1. Interpret these clinical manifestations in association with carcinoid tumour and enumerate the chemical substances released from the tumour.
2. Describe the gross picture of this tumour.
3. Mention the possible cardiac lesions in this patient.

TUMOURS OF COLON

LEARNING OBJECTIVES:

The student should be able to:

1. enumerate the risk factors for cancer colon.
2. Describe the mode of inheritance of this disorder.
3. Mention the different gene mutations in this disorder.
4. Describe the different pathologic pictures of this tumour.
5. Enumerate the different methods of spread of this tumour.

CASE STUDY:

A 39-year-old man is having a routine physical examination because of a history of colon cancer in his family. He has no abdominal tenderness or masses, and active bowel sounds are present. However, his stool is positive for occult blood. Colonoscopy is performed. There are multiple polyps found in the ascending colon: some of these are small 0.5 cm pedunculated tubular adenomas, others are 1 cm tubulovillous adenomas, and one is a 2 cm sessile villous adenoma in the cecum containing a focus of well differentiated adenocarcinoma.

1. What are the risk factors for cancer colon.
2. Describe the mode of inheritance of this disorder
3. Mention the most common gene mutation in this disorder and locate it in karyotyping of this patient.
4. Describe the different pathologic pictures of this tumour.
5. Enumerate the different methods of spread of this tumour.

MALABSORPTION SYNDROME

Learning Objectives:

The student should be able to:

1. Enumerate the different causes of malabsorption syndrome.
2. Describe the microscopic picture of the intestine in different types of intrinsic bowel diseases which cause malabsorption syndrome.

CASE STUDY:

•A 25-year-old man complains of a low volume but chronic, foul smelling diarrhea for the past year. He has no nausea or vomiting. On physical examination there is no abdominal pain or masses and bowel sounds are present. His stool is negative for occult blood. Laboratory studies include a quantitative stool fat of 10 g/day. Upper GI endoscopy is performed with biopsies of the duodenum. The biopsies reveal the absence of villi, increased surface intraepithelial lymphocytes, and hyperplastic appearing crypts.

1. Based on the microscopic examination of the biopsy taken, what is the most probable diagnosis of this case.
2. Enumerate the other confirmatory tests of that disease.
3. Discuss the pathophysiology of that disorder