**REVISED FOUNDATION BLOCK**

**PATHOLOGY DISCIPLINE**

**Pathology contents: 15 lectures**

**Practical sessions: 7 practicals including a supervised tour of the clinical laboratories:**

**Tutors for male students:**

* **Introduction to Pathology : Dr. Al-Rikabi (1 lecture)**
* **Inflammation and Repair : Dr. Al-Rikabi (5 lectures)**
* **Cell injury : Dr. Al-Rikabi (3 lectures)**
* **Granulomatous disease : Dr. Al-Humaidi (1 lecture)**
* **Neoplasia : Dr. Al-Sheikh (5 lectures)**

**Tutor for female students:**

* **Dr. Maha Arafah and Dr. Sufia Husain**

**Tutors of practical sessions:**

 **\* Dr. Marei Makashen (male students)**

 **\* Dr. Shaesta Zaidi (female students)**

**INTRODUCTION TO PATHOLOGY (*one lecture and a supervised tour of the laboratories****).*

***Objectives:***

**The student should:**

A] Understands the role of pathology and its various subspecialities in the diagnostic process.

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B] Understands the meaning of the terminology used during the study of a disease like aetiology, pathogenesis, prognosis, sequelae, symptoms, signs, etc.

C] Be aware of some of the principle techniques used in pathology like light microscopy, cytology, immunohistochemistry and molecular pathology.

D] Have a basic knowledge of the definition of autopsy and its indications.

**Contents:**

* **Definition of Pathology.**
* **Subdivisions and subspecialities of diagnostic pathology** with special emphasis on histopathology and cytology.
* **Classification of diseases** based on their pathogenesis and the role of pathology in general and histopathology in particular in reaching a clinical diagnosis. The student should be made able to understand the meaning of essential terminology like disease incidence, aetiology, pathogenesis, symptoms and signs, prognosis and the role of diagnostic pathology in disease management.
* Brief summary and simple introduction to **the techniques** used in histopathology and cytology including light microscopy, immunohistochemistry, immunofluorescence, electron microscopy and molecular pathology.
* Definitions and indications for **hospital autopsy**.

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**CELL INJURY (*3 lectures and 2 practicals*).**

***Objectives:***

**The students should:**

A] Understands the concept of cells and tissue adaptation to environmental stress including the meaning of hypertrophy, hyperplasia, aplasia, atrophy, hypoplasia and metaplasia with their clinical manifestations.

B] Is aware of the concept of hypoxic cell injury and its major causes.

C] Understands the definitions and mechanisms of free radical injury.

D] Knows the definition of apoptosis, tissue necrosis and its various types with clinical examples.

E] Able to differentiate between necrosis and apoptosis.

F] Understands the causes of and pathologic changes occurring in fatty change (steatosis), accumulations of exogenous and endogenous pigments (carbon, silica, iron, melanin, bilirubin and lipofuscin).

G] Understands the causes of and differences between dystrophic and metastatic calcifications.

***Contents of Lectures 1, 2 and 3:***

**Lecture One** : **Adaptation to environmental stress**: hypertrophy, hyperplasia, aplasia, hypoplasia, atrophy, squamous metaplasia, osseous metaplasia and myeloid metaplasia.

 **Hypoxic cell injury** and itscauses (ischaemia, anaemia, carbon monoxide poisoning, decreased perfusion of tissues by oxygen, carrying blood and poor oxygenation of blood).

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 - **Free radical injury**: definition of free radicals, mechanisms that generate free radicals, mechanisms that degrade free radicals.

**Lecture Two** : **Types of necrosis** : Coagulative, Liquefactive, Caseous, gangrenous, fibrinoid and fat necrosis.

 - **Apoptosis** : definition, morphologic features, regulation of apoptosis and comparison between necrosis and apoptosis.

**Lecture Three** : **Reversible cellular changes and accumulations:** fatty change, hyaline change, accumulations of exogenous pigments (carbon, silica, iron dust, lead and argyria).

- Accumulations of endogenous pigments: melanin, bilirubin, haemosiderin (haemosiderosis and haemochromatosis), lipofuscin.

- **Pathologic calcifications**: metastatic calcification, dystrophic calcification.

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 **INFLAMMATION AND REPAIR (*5 lectures and 2 practicals*).**

***Objectives:***

**The student should:**

A] Be able to identify the cardinal and systemic signs of inflammation and to understand the underlying mechanisms that produce these signs.

B] Understands the vascular changes occurring as a response to tissue injury.

C] Appreciate the importance of fluid production in inflammation including the differences between exudates and transudates.

D] Have some understanding of the various chemical mediators of inflammation and their link with the complement system and potentially with coagulation factors.

E] Have good knowledge about the types and functions of the various inflammatory cells including their role in both acute and chronic inflammation.

F] Be aware of the various complications of the inflammatory response, formation of pus and the production and manifestations of chronic inflammation.

G] Understands the concept of healing and repair with wounds healing by first and second intention as an example.

H] Knows the factors leading to poor healing and inadequate tissue repair.

***Contents:***

**Lecture 1** : **Definition of inflammation**, processes of inflammation in general, cardinal signs and causes of inflammation.

 **Acute inflammation** – role of adhesion molecules, vasoactive changes, increased capillary permeability and types of inflammatory cells in general (neutrophils, lymphocytes, eosinophils, mast cells and basophils).

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**Lecture 2 & 3** : **Cellular response of leukocytes** – emigration, Margination, pavementing, rolling, adhesion and transmigration, chemotaxis, chemotactic factors, phagocytosis (opsonization) and intracellu-

 lar microbial killing. Exogenous and endogenous mediators of acute inflammation including vasoactive mediators, kinin system and complement system.

 **Outcomes of acute inflammation** – resolution, abscess, ulcer, fistulas, scar and conversion to chronic inflammation. Hereditary defects that impair the acute inflammatory response (deficiency of complement components and defects in neutrophils).

**Lecture 4** : **Chronic inflammation**: general considerations of processes leading to chronicity like persistent or recurrent injury and the de novo chronic processes without previous acute inflammation.

**Patterns of chronic inflammation**: non specific chronic inflammation and chronic granulomatous inflammation.

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**Lecture 5**  : **Tissue repair include**:

A] Restoration of normal structure: labile cells, stable cells and permanent cells.

B] Cellular proliferation and growth factors like PDGF, epidermal growth factor and fibronectin – transforming growth factor, macrophage derived growth factor.

C] The repair process in wound healing by first and second intention: removal of debris, formation of granulation tissue and scarring.

 D] Factors that delay or impede repair**.**

**GRANULOMATOUS DISEASES (*One lecture and one practical)***

***Objectives:***

**The student should:**

A] Appreciate the high prevalence of granulomatous diseases in the Kingdom of Saudi Arabia with special emphasis on tuberculosis.

B] Understands the mechanisms and causes of granuloma formation with special emphasis on interaction between T lymphocytes, macrophages and epithelioid histiocytes.

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***Contents:***

**GRANULOMATOUS DISEASES (One Lecture).**

**Lecture 1**  : - **Definition and mechanisms of granuloma formation** including cellular constituents of granulomas.

  *-* **Causes** of granulomatous diseases.

 **NEOPLASIA (5 lectures and 2 practicals).**

**Objectives:**

The student should:

A] Be able to define a neoplasm and knows the differences between benign and malignant neoplasms.

B] Understands the concepts governing the classification of tumours and their nomenclature.

C] Have a basic knowledge of the carcinogenic agents in human tumours including chemical, physical, viral, genetic and hormonal.

D] Understands important modes of tumour spread with common examples including spread of carcinomas and sarcomas.

E] Be aware of the major clinical effects and features of tumours including: obstruction, ulceration, infection, anaemia, cachexia and effects of products of tumours including inappropriate hormone production.

F] Understands the basic of grading and staging of malignant neoplasms with special emphasis on the TNM staging system.

G] Know the role of tumour markers in the diagnosis and prediction of malignant tumours prognosis.

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***Contents:***

**Lectures 1 & 2 :**

\* Introduction.

\* Definitions.

\* Nomenclature and classification of tumors.

**\*** Characteristics of benign and malignant tumors.

\* Epidemiology.

**Lecture 3 & 4 :**

\* Carcinogenesis and molecular basis of cancer.

\* Factors inducing carcinogenesis.

**Lecture 5**  :

\* Major clinical features of neoplastic disorders.

\* Grading and staging of malignant neoplasms.

\* Laboratory investigations and tumour markers.

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**FOUNDATION BLOCK PRACTICAL CLASSES**

**Tutors: Male students: Dr. Amer Shafie.**

 **Female students: Dr. Shaesta Zaidi.**

**Total number of practical sessions: 7.**

**Site: Students laboratories at KKUH and the Girls College.**

***Format:***

1] Introductive explanatory lecture.

2] Powerpoint projection of gross specimen and microscopic sections.

3] Students will be asked to examine pictures, microscopic slides and pathology museum jars representing organs and tissue sections of the lesions included in the curriculum.

4] The students will also be given a CD including all the gross and microscopic slides studied in order to encourage self directed learning.

***Contents*** will consist of gross and microscopic pictures of various lesions and diseases which are related to/or are examples of cell injury lesions, inflammatory disorders, granulomas, circulatory disorders and neoplastic lesions.

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