Introduction to pathology

Pathology

Pathology word derived from the Ancient Greek words

Pathology→ pathos + Logos

suffering "study of"

Definition:

Pathology is the study of the structural , biochemical functional changes in cells , tissues and organs that underlies the disease.

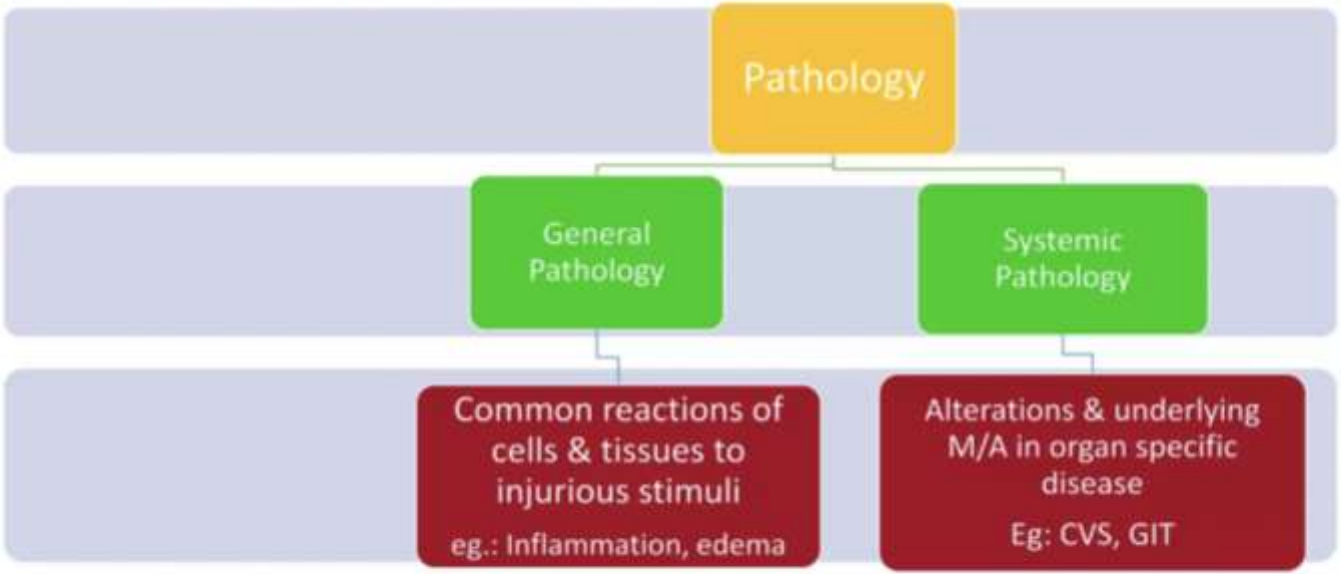
Rudolf Virchow

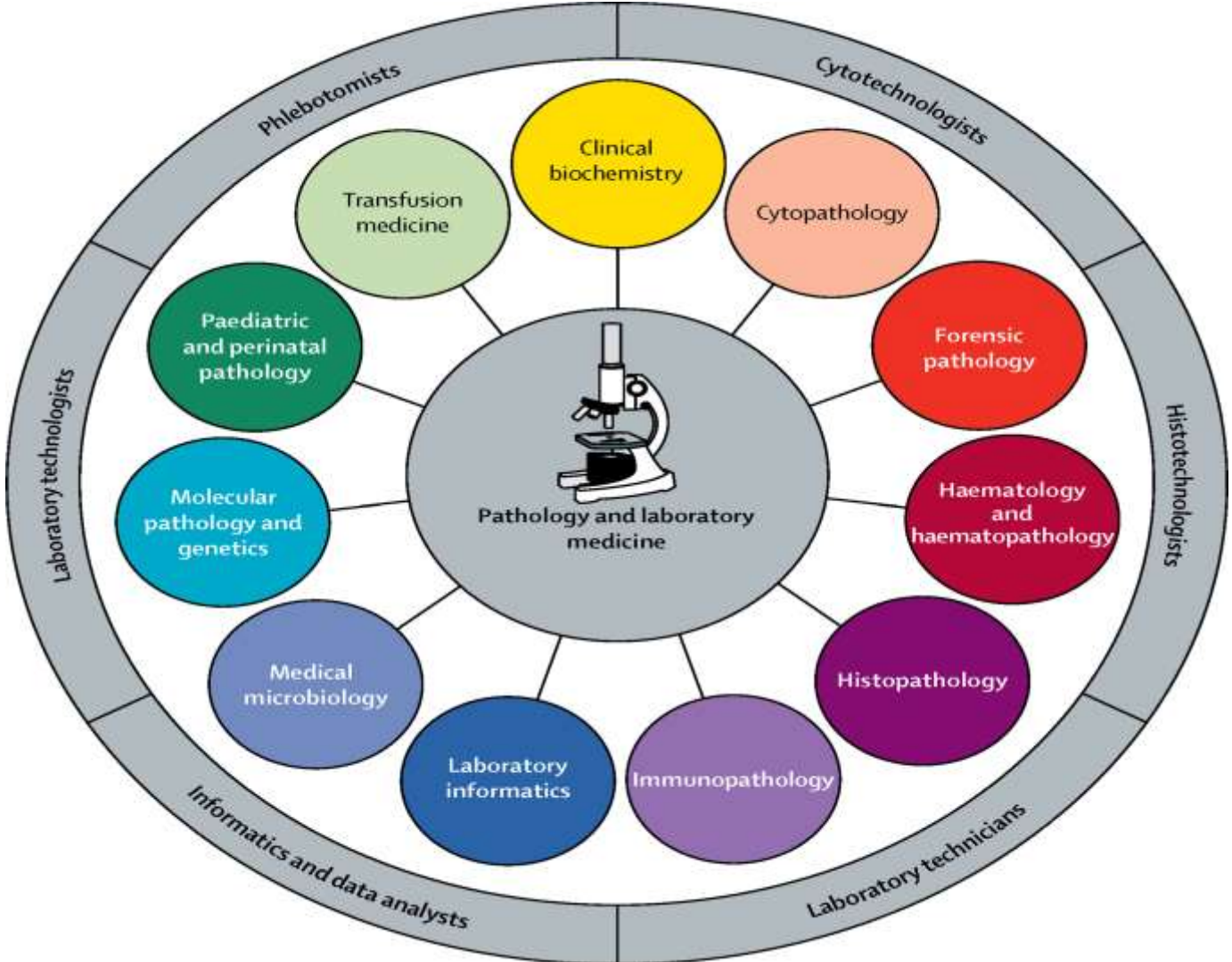
+ disease originates at the cellular level.
+ NOW, cellular disturbances arise from alterations in molecules (genes, proteins, and others) that influence the survival and behavior of cells.
+ SO the foundation of modern pathology is understanding the cellular and molecular abnormalities that give rise to diseases.

Branches of pathology

Histopathology	Diagnosis of disease by gross & microscopic examination of tissue
Cytopathology	Diagnosis of disease on cellular level, by examination of isolated cell
Haematology	Blood related disorder
Clinical pathology	Diagnosis of disease based on laboratory analysis of bodily fluids such as urine, ascetic fluid
Chemical pathology	Diagnosis of disease by using the tools of chemistry
Immunopathogy	Diagnosis of disease by detecting Ag-Ab specific reaction
Forensic pathology	Concerned with determining cause of death
Molecular pathology	Diagnosis of disease through the examination of molecules within organs, tissues or bodily fluids

Division of Pathology




Phlebotomists
Cytotechnologists
Laboratory technologists
Histotechnologists
Informatics and data analysts
Laboratory technicians
Clinical biochemistry
Transfusion medicine
Cytopathology
Paediatric and perinatal pathology
Forensic pathology
Molecular pathology and genetics
Pathology and laboratory medicine
Haematology and haematopathology
Medical microbiology
Histopathology
Laboratory informatics
Immunopathology

What is disease?

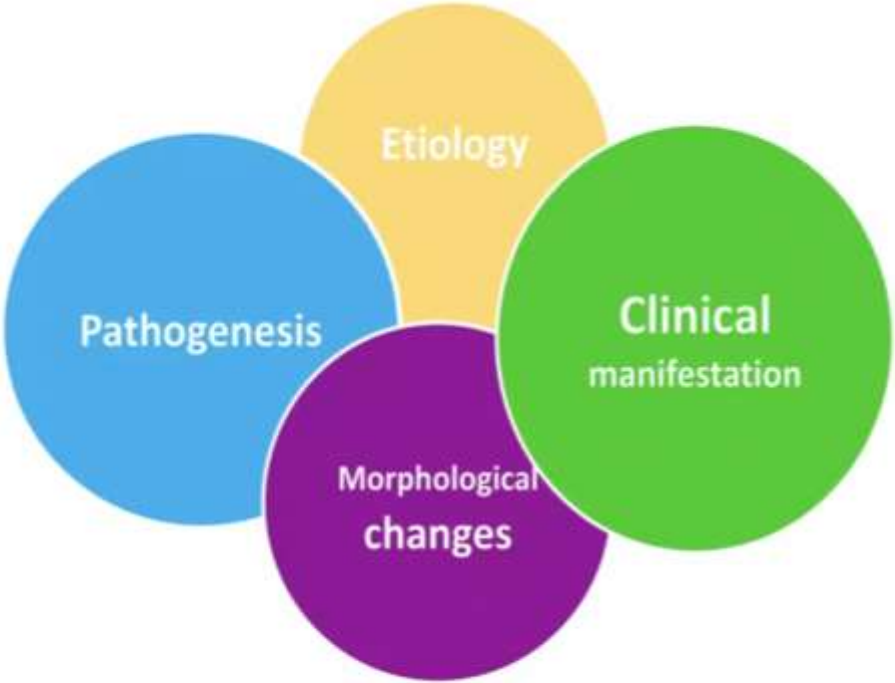
Disease may be defined as :

an abnormal alteration of structure or function in any part of the body.

Steps of disease study

- Definition
- Epidemiology – Where & When.
- Etiology- To identify the cause of disease
- Pathogenesis- Evolution or mechanism of disease
- Morphology – Structural changes & Functional consequences
- Clinical manifestation
- Complications
- Management
- Prognosis- probable result of an attack of disease and the prospect of recovery.
- Prevention

Core of pathology



Etiology

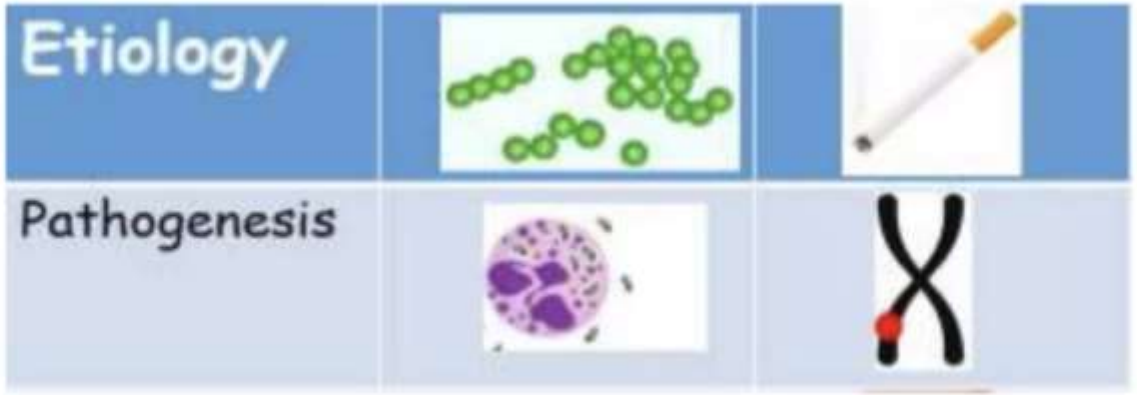
"Study of the cause of a disease"

Knowledge of etiology remains the backbone of:

- Disease diagnosis
- Understanding the nature of diseases
- Treatment of diseases.

Pathogenesis

- The sequence events in the response of the cells or tissues to the etiologic agent, from the initial stimulus to the ultimate expression of the disease.



Pathogenesis ..The "HOW''

*+mechanisms of **development** and **progression** of disease,*

*+the cellular and molecular changes that give rise to the specific **functional** and **structural** abnormalities that characterize the disease.*

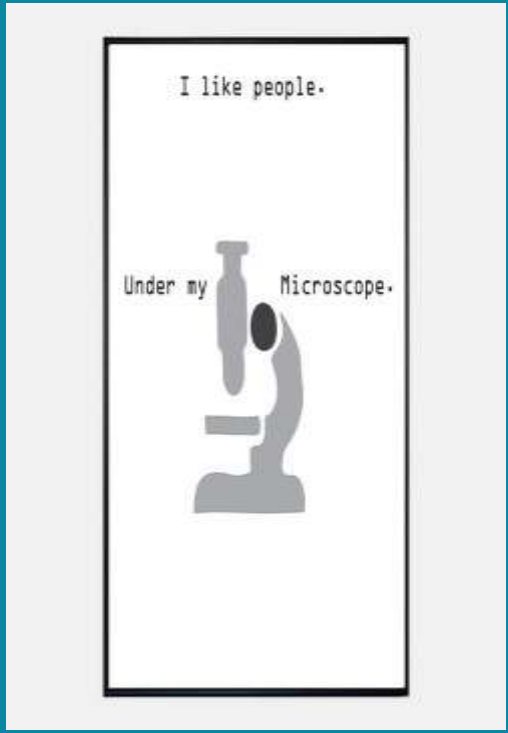
Etiology and pathogenesis of disease are essential for understanding disease ++ also is the basis for developing ***rational*** *treatments and effective preventive measures. Thus,* ***pathology provides the scientific foundation for the practice of medicine.***

Morphology *is structural alteration of cell and tissue as a result of the pathogenesis:*

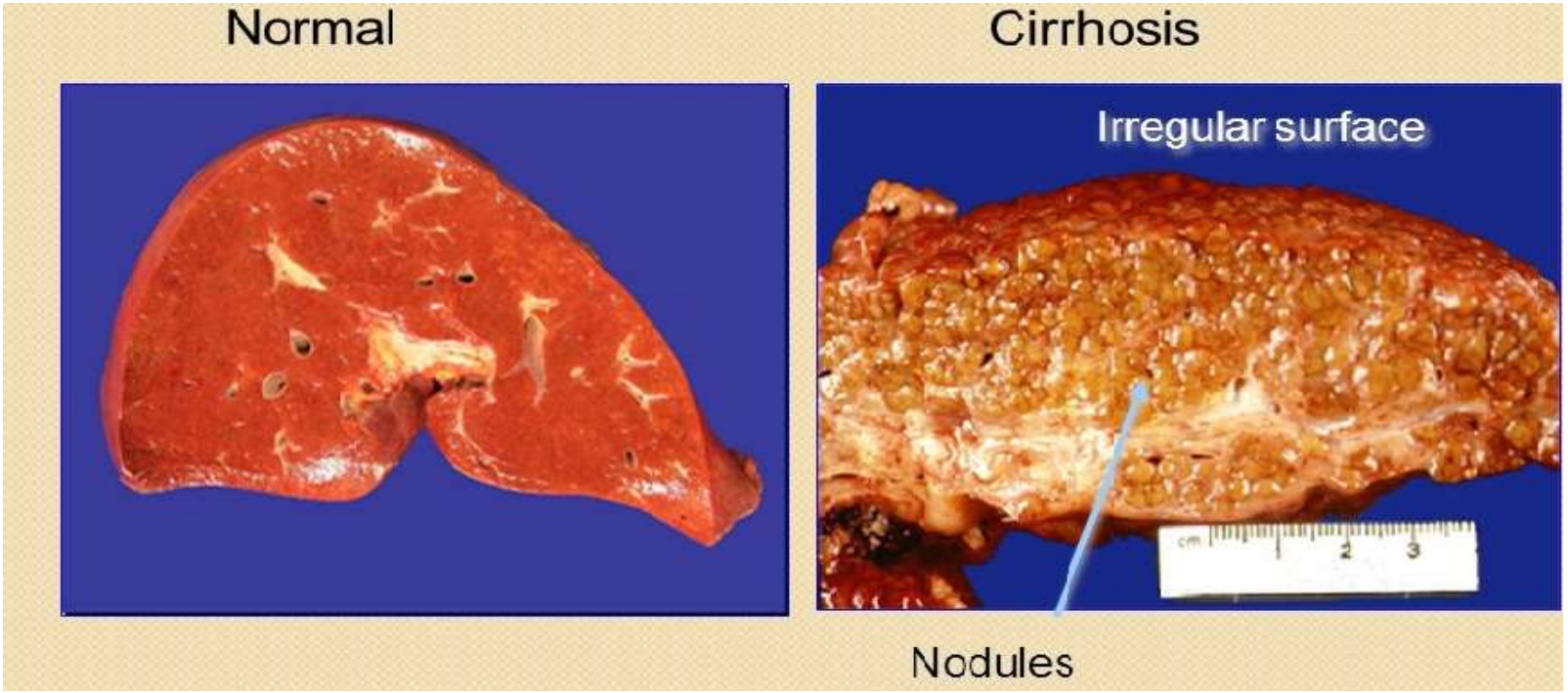
+ gross : naked eye

+ microscopic

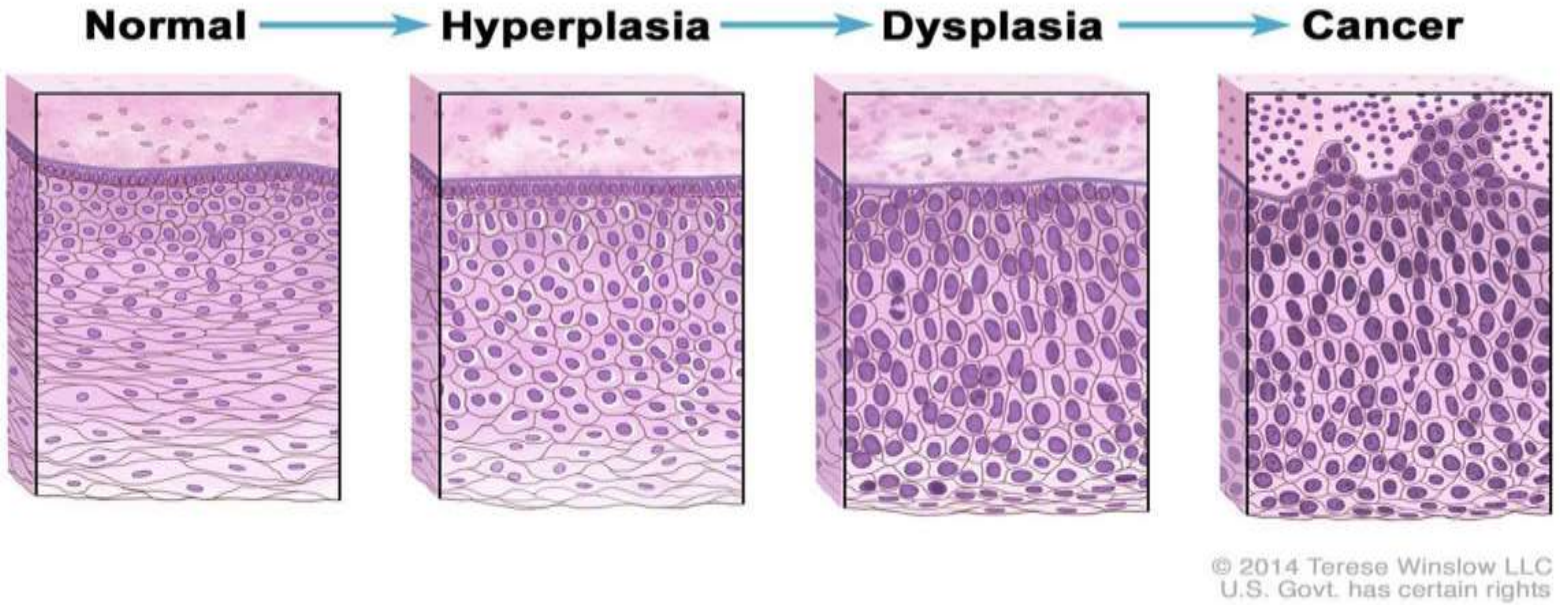
+Pathologists also use a variety of molecular, and other techniques to define the biochemical, structural, and functional changes that occur in cells, tissues, and organs in response to injury.

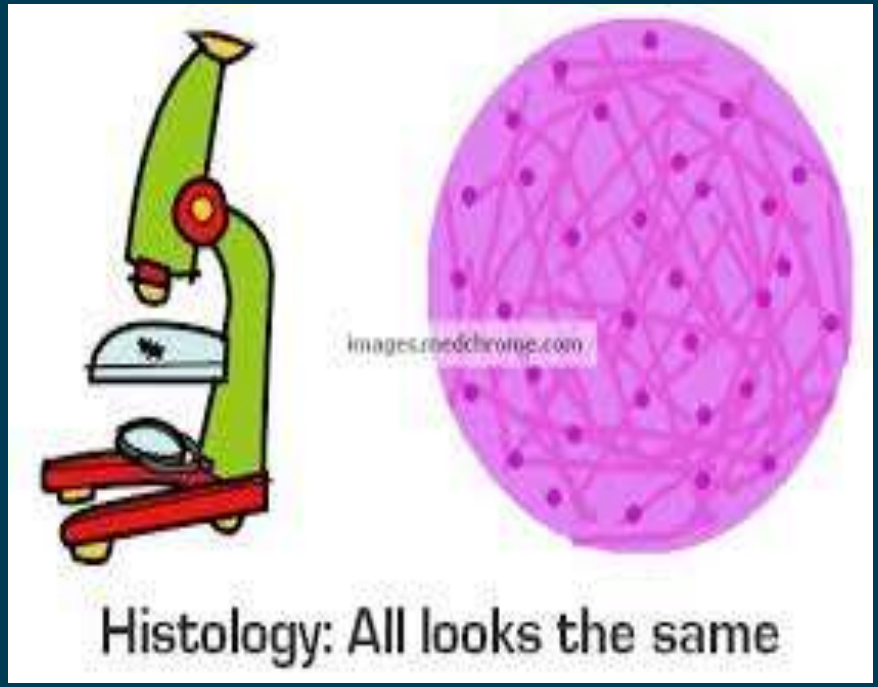


Morphology, Gross (Naked eye)



Morphology, microscopic

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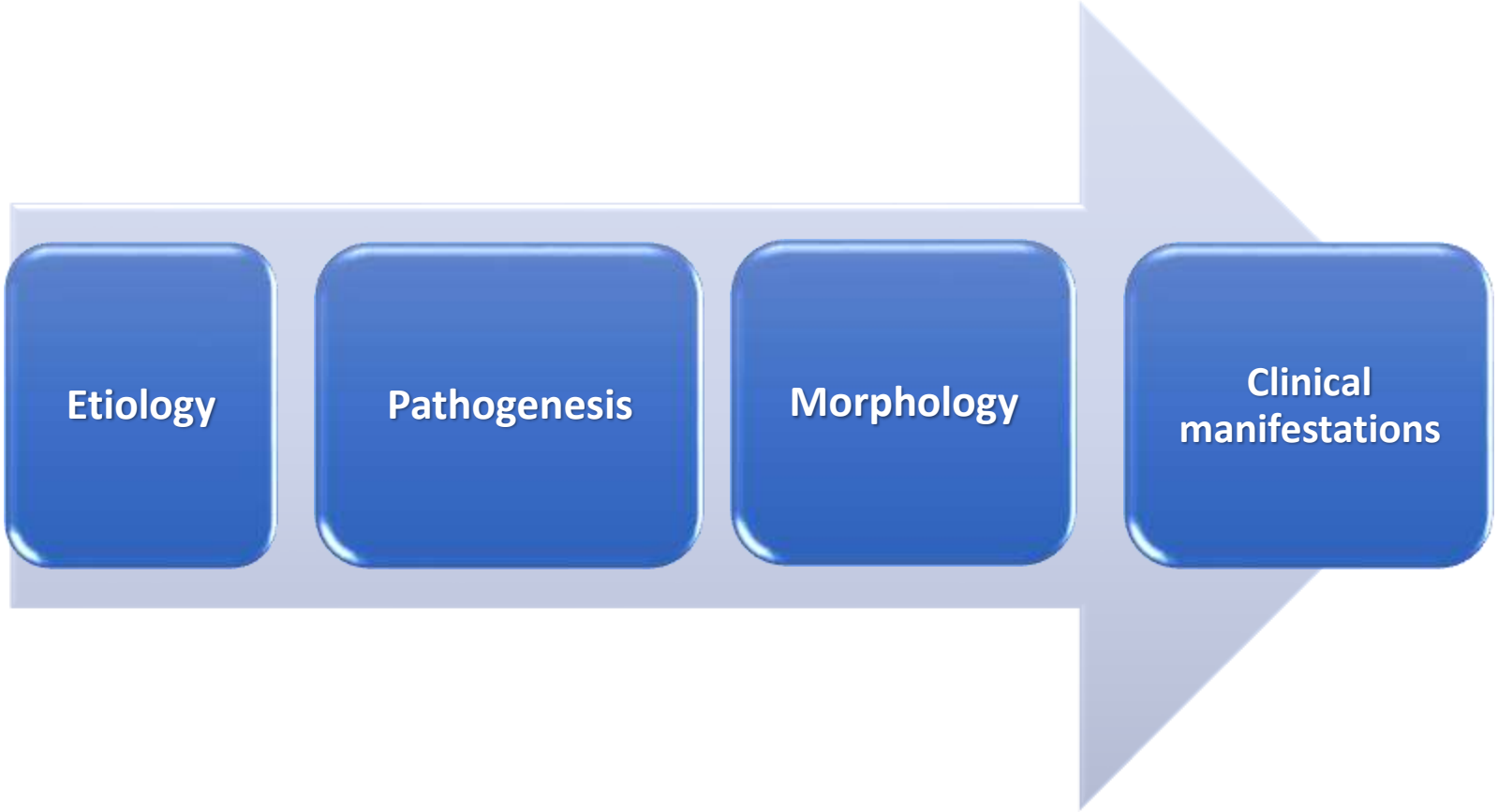
Histology: All looks the same


Etiology
Pathogenesis
Morphology
Clinical manifestations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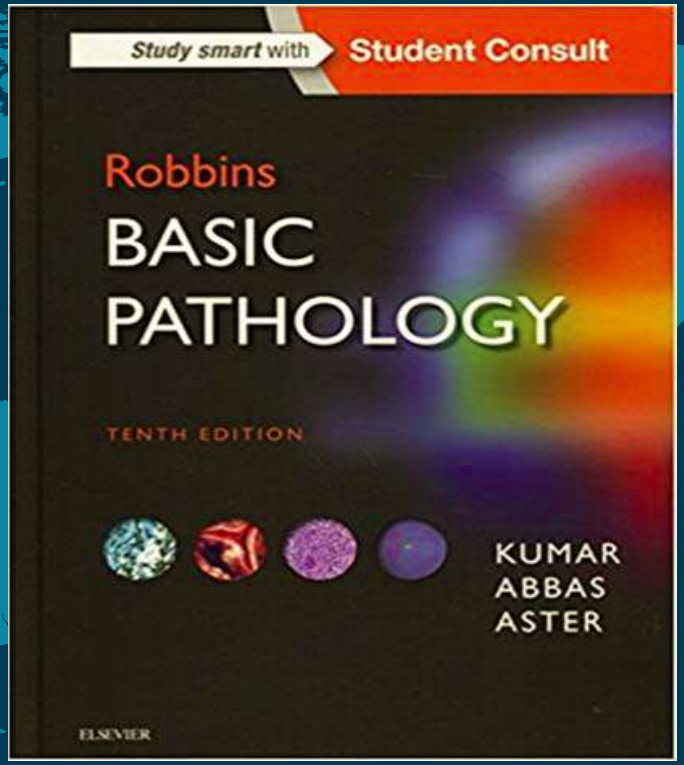
The book .. ☺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PATHOLOGY
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KUMAR
ABBAS
ASTER
ELSEVIER

So what do pathologist do?

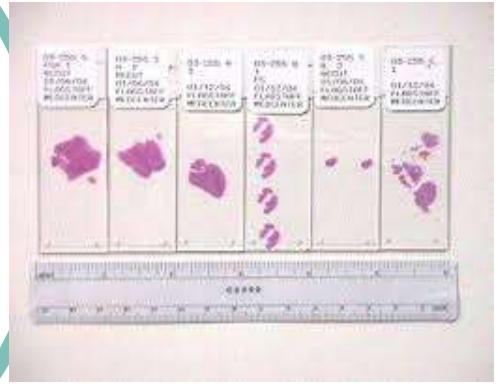
1st: The Sample .. What do we get?

Resections

Biopsy, like :

- **Bone marrow aspiration and biopsy**
- **Cardiac biopsy**
- **Core biopsy**
- **Endometrial biopsy, D&C**
- **Endoscopic biopsy**
- **Bronchoscopic biopsy**
- **Excisional and incisional biopsy**
- **Fine-needle aspiration biopsy**
- **Lymph node biopsy**
- **CT guided Needle biopsy**
- **Punch biopsy**
- **Shave biopsy**

Pathology Lapratory



Grossing

Processing into a paraffin block

Microtome

Staining H&E ☺

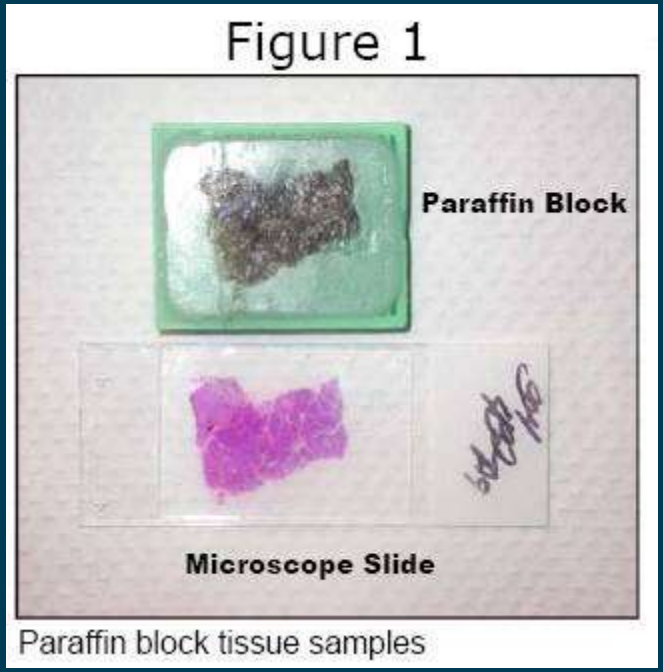


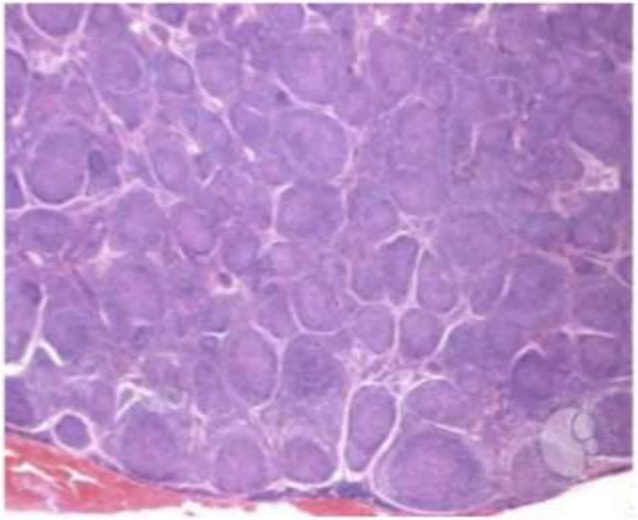
Figure 1
Paraffin Block
Microscope Slide
Paraffin block tissue samples

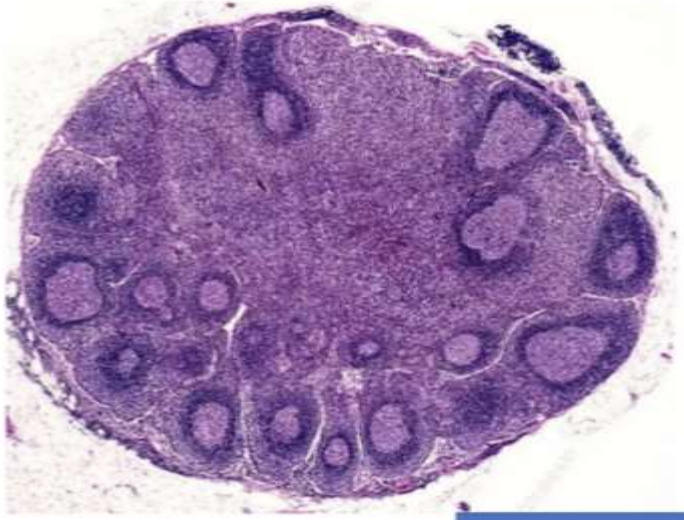
Diagnosis

Sample case

- A 60 years old women came with a lump in the neck of 6 months duration.
- Patient has fever with raised ESR.
- O/E – she also had enlarged inguinal lymph nodes. Further investigations were within normal limit.

- Biopsy was taken (tissue is removed for microscopic examination)





Normal Lymph node

- Genetic Studies : Translocation t18: 14
- Diagnosis: Follicular lymphoma

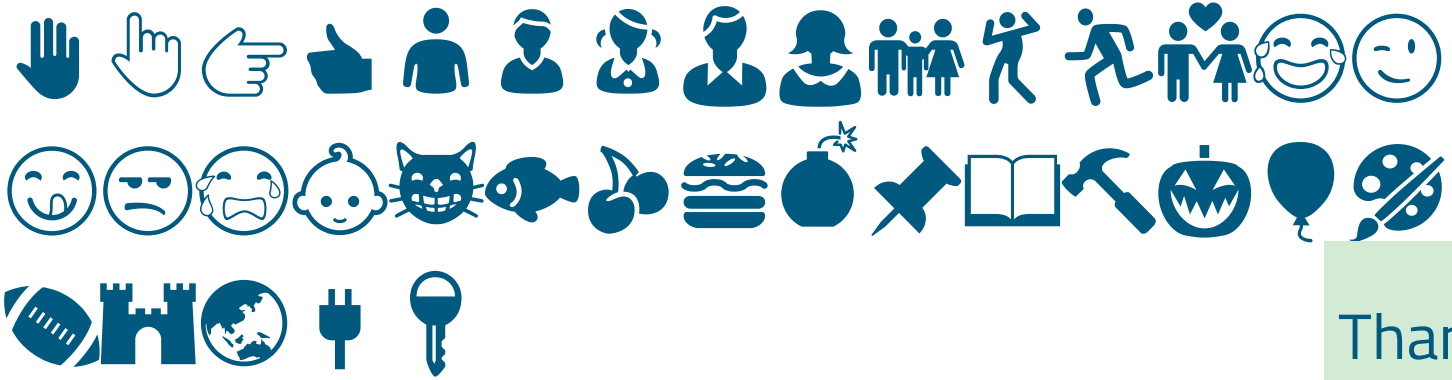
Treatment : Chemotherapy

Prognosis : Good

Therefore

PATHOLOGY AIDS IN DIAGNOSIS & MANAGEMENT OF DISEASE PROCESSES

Now. Who wants to be a pathologist ☺



Thank

You