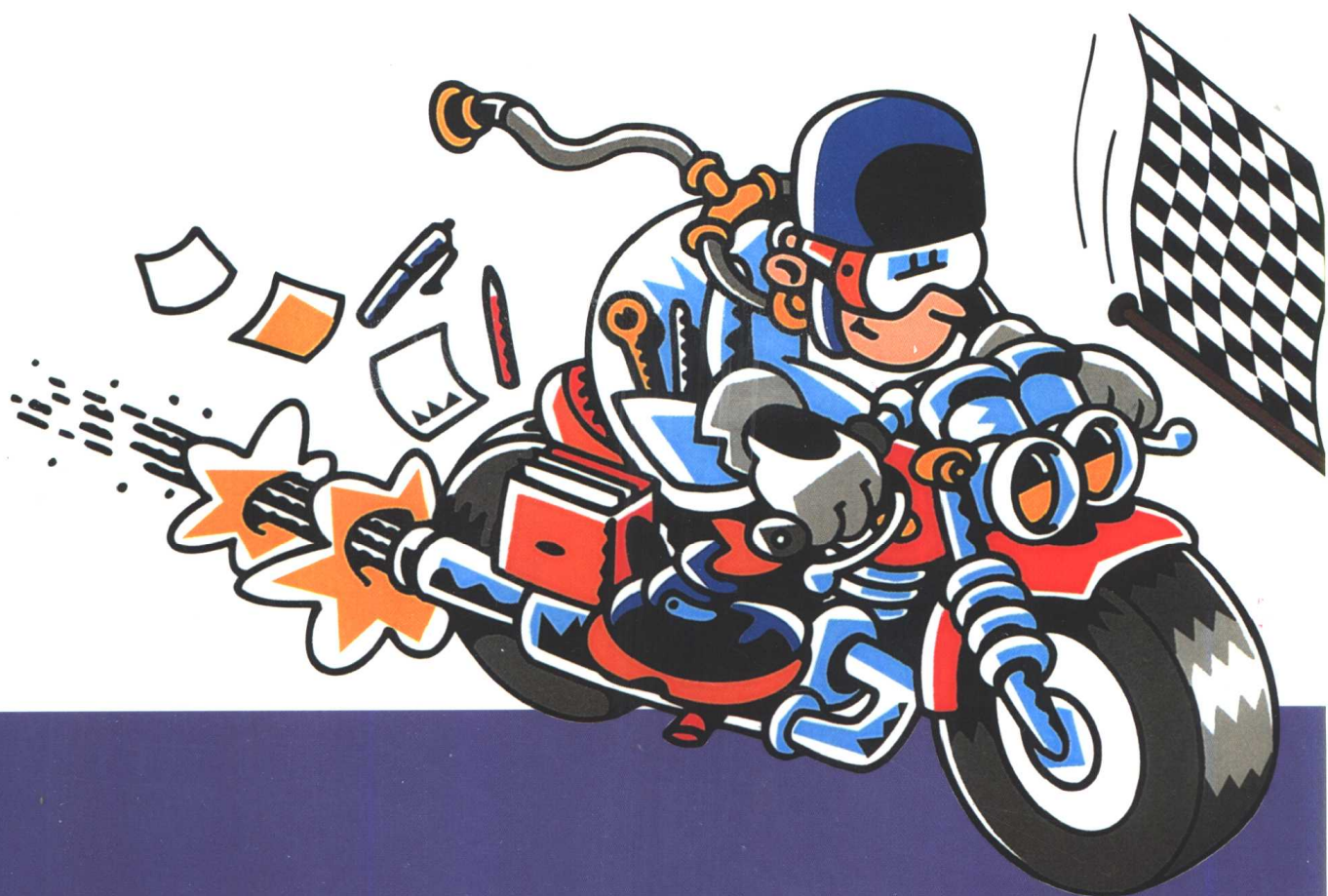


风暴式医学教程 *MOSBY'S CRASH COURSE* (原版英文医学教程)

病理学

Pathology

Bethan Goodman Jones
with Daniel Horton-Szar as Series Editor



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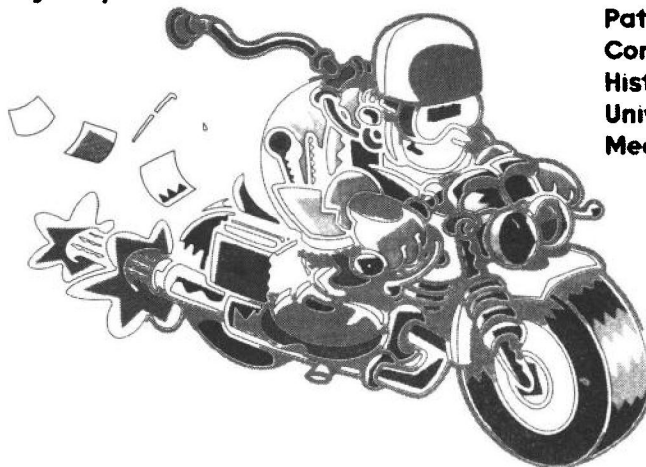
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Preface

Sifting through large volumes of pathology and wading through pages of irrelevant data can be a daunting task for many medical students, particularly when time is limited and exams are looming on the horizon. Yet, a basic knowledge of pathology is essential towards an understanding of not only how different diseases arise, but also their clinical effects, outcomes and treatments.

In this book, we have tried to present clinically relevant pathology in a way that is concise and to the point, yet contains sufficient factual detail to satisfy examination requirements. From past experience, we have found that being able to visualise a process is key to understanding. With this in mind, an abundance of illustrations have been included throughout the text to enhance the understanding of the more difficult concepts, and to highlight key features of the more important diseases. We hope this works for you, too.

Bethan Goodman Jones

Pathology lies at the core of medical practice. Without knowledge of the pathology of a disease it is difficult to predict what features might be present in a patient with the disease and diagnosis may be problematic. Treatment must also be related to pathology; a tumour that is known to metastasise early in its development is not going to be cured by local surgical excision—it requires systemic therapy. Unlike treatments, the principles of pathology remain relatively constant, so the student who learns pathology well will benefit from a long-term payoff.

This book covers the whole spectrum of human pathology with a great emphasis on instructive diagrams and summary tables that give a succinct overview of the subject. The author has a background in cell biology as well as studying medicine, so there is good integration between the basic clinical sciences and clinical pathology. The text includes all recent developments in pathology such as acquired immunodeficiency syndrome, inherited cancer syndromes and molecular biology of tumours.

Dr Simon S Cross
Faculty Advisor



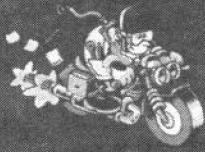
Preface

OK, no-one ever said medicine was going to be easy, but the thing is, there are very few parts of this enormous subject that are actually difficult to understand. The problem for most of us is the sheer volume of information that must be absorbed before each round of exams. It's not fun when time is getting short and you realize that: a) you really should have done a bit more work by now; and b) there are large gaps in your lecture notes that you meant to copy up but never quite got round to.

This series has been designed and written by senior medical students and doctors with recent experience of basic medical science exams. We've brought together all the information you need into compact, manageable volumes that integrate basic science with clinical skills. There is a consistent structure and layout across the series, and every title is checked for accuracy by senior faculty members from medical schools across the UK.

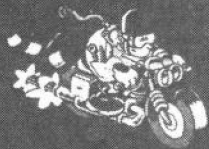
I hope this book makes things a little easier!

Danny Horton-Szar
Series Editor (Basic Medical Sciences)



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I would like to thank all those who helped to produce this book, in particular Dr Simon Cross for useful suggestions and sneak previews of pathology lecture outlines.



Dedication

*To my Father
who would have enjoyed seeing
the completed version of this book*



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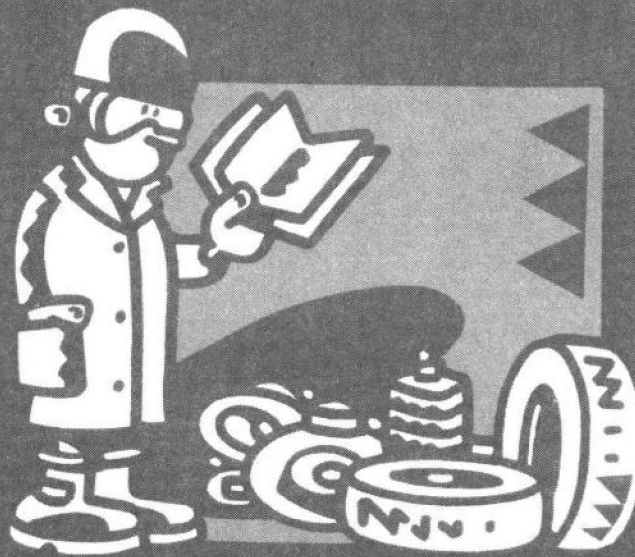
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PRINCIPLES OF PATHOLOGY

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1. Introduction to Pathology

DISEASE

Disease can be defined as any condition that limits life in either its power, enjoyment or duration.

PATHOLOGY

Pathology is the scientific study of disease. It is concerned with the causes and effects of disease, and the functional and structural changes that occur during the course of a disease.

These changes range from alterations at the molecular level, to the clinical manifestations of the disease at the level of the individual.

Understanding the processes of disease is essential for accurate recognition, diagnosis and treatment of disorders.

Divisions of pathology

Pathology is traditionally subdivided into five main disciplines according to how it is practised within hospitals. The divisions are:

- Histopathology—the study of histological abnormalities of diseased cells and tissues.
- Haematology—the study of primary diseases of the blood, and the secondary effects of other diseases on the blood.
- Chemical pathology—the study of biochemical abnormalities associated with disease.
- Microbiology—the study of infectious diseases and the organisms that cause them.
- Immunopathology—the study of diseases through analysis of immune function.

The 'surgical sieve' approach to pathology

The causes of disease are numerous and diverse, therefore it is useful to classify these causes according to a 'surgical sieve' approach. The cause of any disease can be classified into at least one of the following categories.

Congenital

Congenital causes can be either genetic or non-genetic.

Acquired

Acquired causes can be any of the following:

- Trauma.
- Infections and infestations.
- Neoplasms.
- Circulatory disturbances.
- Immunological disturbances.
- Degenerative disorders.
- Nutritional deficiency diseases.
- Endocrine disorders.
- Psychosomatic factors.
- Iatrogenic disease.
- Idiopathic disease.

However, many if not most diseases are due to a combination of causes and are therefore said to have multifactorial aetiology.



It is useful (and, in examinations, very important!) to have a logical and methodical approach to diseases. See Fig. 1.1 for an outline of a series of characteristics worth applying to any disease.

HOW PATHOLOGY IS COVERED IN THIS BOOK

Part I Principles of pathology

The number of tissue responses that underlie all diseases is limited. These responses are known as basic pathological responses. The first part of this book describes the principles of these.



Part II Systematic pathology

As well as an understanding of the basic pathological responses, it is also necessary to understand how they affect individual tissues and organs. The second part of this book describes the common pathology of the specific diseases as they affect individual organs or organ systems. This approach is termed systematic pathology.



- Define 'disease'.
- Define 'pathology'.
- What are the divisions of pathology?
- What are the different disease categories?

Characteristics worth applying to a disease

Characteristic	Explanation
definition	clear, concise and accurate definition is an essential starting point
epidemiology	incidence/prevalence and variation with age, sex, race and geography
aetiology	the cause of a disease
pathogenesis	the mechanism by which a disease is caused
morphology	morphological, functional and clinical changes which occur during the course of the disease
complications and sequelae	secondary consequences of a disease
treatment	existing treatments, their effectiveness and side effects
prognosis	expected outcome of a disease

Fig. 1.1 Characteristics worth applying to any disease. Incidence is the number of new cases of disease occurring in a population of a defined size during a defined period. Prevalence is the number of cases of disease to be found in a defined population at a stated time.



2. Cancer

DEFINITIONS AND NOMENCLATURE

Definitions

Tumour

A tumour is an abnormal mass of tissue resulting from autonomous disordered growth which persists after the initiating stimulus has been removed. Tumours are:

- **Progressive**—they are independent of normal growth control and continue to grow regardless of requirements, and in the absence of any external stimuli.
- **Purposeless**—abnormal mass serves no useful purpose.
- **Parasitic**—endogenous in origin but draw nourishment from the body while contributing nothing to its function.

All tumours have the suffix '-oma', which means a swelling.

Other definitions are:

- **Neoplasm** (i.e. new growth)—synonymous with tumour.
- **Neoplasia**—the process of tumour growth.
- **Cancer**—a malignant neoplasm (see p. 6).
- **Anaplastic neoplasm**—a very poorly differentiated neoplasm.

Dysplasia

Dysplasia is the disordered development of cells resulting in an alteration in their size, shape and organisation. It may be reversible but is also known to precede neoplasia. Normal growth, dysplastic growth and neoplastic growth may be viewed as a continuum.

Metaplasia

Metaplasia is the change from one type of differentiated tissue to another, usually in response to an irritating stimulus, e.g. a change from mucus-secreting epithelium to stratified squamous epithelium in the bronchial irritation associated with smoking.

Characteristics of benign versus malignant tumours		
Characteristics	Benign	Malignant
behaviour <ul style="list-style-type: none"> • most important feature • invasion • metastases • growth rate 	remains localized no never slow	spreads yes frequent rapid
microscopic anatomy <ul style="list-style-type: none"> • cell size and appearance • differentiation (resemblance to normal tissue) • mitoses • nuclear chromatin 	cells of uniform size and appearance good few normal	cells and nuclei vary in size and shape poor many increased
macroscopic anatomy <ul style="list-style-type: none"> • direction of growth on skin/mucosal surfaces • ulceration • border 	often exophytic rare circumscribed, often encapsulated	often endophytic common on skin and mucosal surfaces irregular, ill-defined and non-encapsulated
effects	usually due to compression of normal tissue, e.g. vessels, tubes, nerves, etc., removal alleviates effects	invades and destroys normal tissue removal of tumour does not restore function

Fig. 2.1 Characteristics of benign versus malignant tumours. Note that invasion is the only absolute distinguishing feature between benign and malignant neoplasms.



Benign versus malignant

Tumours are classified as either benign or malignant according to their appearance and behaviour (Fig. 2.1).

Nomenclature of tumours

Tumour nomenclature (Fig. 2.2) is based on



A few simple rules to follow:

- -oma: suffix for tumours. But there are some non-neoplastic '-omas', e.g. granuloma, tuberculoma and mycetoma.
- Carcinomas: malignant tumours of epithelial origin; prefixed by tissue of origin.
- -aemia: suffix for neoplastic disorders of the blood (but there is one non-neoplastic '-aemia', i.e. anaemia).
- -sarcomas: suffix for malignant tumours of connective tissue origin.

histogenesis and behaviour. Histogenesis gives information about the type of cell from which the tumour has arisen, while behaviour gives information on whether the cell is benign or malignant.

Classification of carcinomas

Carcinomas can be further categorized according to the extent of their invasion.

Carcinoma *in situ*

This is an epithelial neoplasm which has all the cellular features associated with malignancy but which has not yet invaded through the epithelial basement membrane. The *in-situ* phase may last for several years before invasion commences.

Intra-epithelial neoplasia

This covers the spectrum of changes short of invasive carcinoma:

1. Mild dysplasia.
2. Moderate dysplasia.
3. Severe dysplasia/Carcinoma *in situ*.

It is usually divided into three categories, e.g. cervical intraepithelial neoplasia: CIN1, CIN2 and CIN3.

Examples of tumour nomenclature		
Histological type	Benign	Malignant
epithelial tumours <ul style="list-style-type: none"> • glandular • non-glandular, e.g. squamous cell, transitional cell, basal cell 	adenoma papilloma <ul style="list-style-type: none"> • squamous cell papilloma • transitional cell papilloma • basal cell papilloma 	adenocarcinoma carcinoma <ul style="list-style-type: none"> • squamous cell carcinoma • transitional cell carcinoma • basal cell carcinoma
connective tissue tumours <ul style="list-style-type: none"> • adipose tissue • cartilage • bone • smooth muscle • voluntary muscle • blood vessels 	lipoma chondroma osteoma leiomyoma rhabdomyoma angioma	liposarcoma chondrosarcoma osteosarcoma leiomyosarcoma rhabdomyosarcoma angiosarcoma
haemopoietic tumour	*	leukaemia
lymphoreticular tumour	*	lymphoma
melanocytes	*	malignant melanoma
germinal cell tumour	benign teratoma	malignant teratoma

Fig. 2.2 Examples of tumour nomenclature. * represents those tumours that are always malignant and do not have benign counterparts.