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MEDICAL DIAGNOSTICS*

中英双语

医学诊断学

(下册)

主编 周巧玲 杨天伦



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序

诊断学是关于各科临床医生基本功的科学，包括怎样向患者询问病史，通过视、触、叩、听方法进行体格检查；采取患者的血、尿、大便标本进行常规检查；根据病情需要进行肝肾功能、体液检查、凝血机制及骨髓细胞学等常用实验室检查，分析其实验结果的临床意义，通过病史、体格检查和各项实验室检查，综合分析对疾病进行诊断，并书写成病历。这门学科是各科医生必需具备的基本功。最近国内外的知名临床专家一致认为，尽管近年来医学科学迅速发展，已有 CT、MRI、PET/CT、核医学等多种先进诊断设备，但仍然不能完全代替问、视、触、叩、听等传统的基本检查来获取临床第一手资料而进行完美的诊断，故强调临床医生不能单单依靠高、精、尖的机器设备，看病要回归基本功。我个人认为一个合格的临床医生，首先要有过硬的基本功，这是医生成长的必经之路，本书正是这些内容，需要认真学习和练习，必须熟悉掌握。

随着国内外交流的增多，近年来对医学院的学生强调要进行双语教学，即一部分内容要用英语上课，或者在用中文讲课的时候要交代有关专业英语的词语，这种教学方法已探索了多年，教师们急需有一本较好的中英双语教材，为此中南大学湘雅医院诊断学教研室组织了具有丰富教学经验的教师，根据目前使用的第6版《诊断学》教材为背景，参照国外相关著作编写了这本书，应该说能基本满足教师中英双语教学的需要。诚然由于经验不足，且限于英语水平，不足之处难免，欢迎指正，使之在使用过程中逐步修改和完善。



2011.7.

前 言

诊断学既是从事临床医务工作人员及高等院校医学本科生、研究生的必修课程，也是从基础医学过渡到临床医学的一门非常重要的桥梁课程。任何一位优秀临床医生的成长均离不开诊断学基本理论、基本知识和基本技能的学习与训练。以往我国医学生教育的诊断学教学仅有中文版《诊断学》教材，但近年来随着医学教育学制的改革，如八年制医学生教育和对外交流的需要，医学双语教学显得日趋重要。迄今为止，我国尚无正式出版的双语诊断学教材用于临床教学，故双语诊断学教学过程中其内容、形式与医学术语均欠统一、欠规范。基于此缘由，我们在重温历届中文版《诊断学》教材内容基础上，参照国外相关诊断学教材，进行了《中英双语医学诊断学》的编写。本书包括物理诊断和实验诊断两部分，共有4篇18章，目的是为医学临床教学提供一本参考书。尽管我们参阅了许多相关中外文教材，但由于我们的理解能力与编写水平有限，缺点或不足在所难免，敬请广大师生与读者不吝赐教，为我们再次修改完善提供指导，也为保证临床医学教学的科学严谨性提供保障。

周巧玲 杨天伦

中南大学湘雅医院诊断学教研室

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Part 3 Laboratory diagnosis

Chapter 1 Introduction

I . Laboratory diagnosis and its development

1. General concepts

Laboratory diagnosis is a clinical activity in which information acquired in a clinical laboratory at the order of physicians is used for prevention, diagnosis, treatment and prognosis. It consists of three stages: pre-analysis, analysis, and post-analysis.

(1) The pre-analysis stage covers the following: Physician's analysis of the case, selection and combination of tests, deliberation by senior physicians, giving test orders, requesting laboratory tests, preparation of patients, collection of original samples, transferring to and within laboratories.

(2) The stage of analysis, aiming to provide information for prevention, diagnosis, treatment and assessment of human health, carries out analysis of samples from human bodies of biology, microbiology, immunology, chemistry, hematology, physiology, cytology, pathology and other diagnostic tests, and then offers consultation relating to the tests, including the interpretation of results and consultation regarding further testing.

(3) The post-analysis stage covers systematic checking, standardization report format and interpretation of results, authorizing reports, reporting results, transfer and storage of samples. The lab data and information acquired through the above procedures, along with clinical data, are taken into account in an integrated manner. Laboratory analysis is a major part in diagnosis, which physicians have to master.

2. Laboratory diagnostics and laboratory medicine

The purposes of researching and teaching of the two courses emphasize two foci. Laboratory diagnostics lays emphasis on clinical use of laboratory testing, while laboratory medicine on the research and improvement of testing methods. Laboratory diagnostics deals with the primary teaching of various clinical medicine diagnostics specialties. The key of the course is to help students master clinical thinking and make exhaustive use of test results for clinical cases. Through a full systematic and comprehensive analysis of organic functional status, pathologic changes, disease causes and other objective data, which are revealed from the test results, physicians can gauge the health

status, guide the clinical diagnosis, monitor diseases, observe the effect of treatment and evaluate prognosis. In comparison, laboratory medicine emphasizes research and improvement of test equipments, reagents and methods, offering accurate test results to clinical departments, carrying out test items, devising and selecting testing technology, controlling the testing quality, and so on.

3. The major components of laboratory diagnosis

(1) Hematological examination: The lab tests are for hematological changes caused by primary blood diseases of blood and blood-forming tissue and non-hemopoietic tissue diseases. The tests cover the counting of red blood cell, white blood cell and platelet, cytopoiesis dynamics, morphology, cytochemistry, hemostatic properties, thrombo-embolism, hemolysis, identification of blood type and cross matching of blood.

(2) Body fluids and stool examination: The routine testing of urine, stool, various body fluids, stools or secretion such as gastric juice, cerebrospinal fluid, bile, and other fluids.

(3) Biochemical tests: The clinical biochemical tests include tests for physiological ingredients of organic bodies, their metabolism, biochemical function of vital organs, toxicology analysis, monitoring the concentration of drugs, ie, the tests for sugar, fat, protein and their metabolites and derivatives, the tests for electrolytes and trace elements in blood and body fluids, the tests for blood gas and acid-base balance, clinical enzymology test, the tests for hormones and endocrine function, concentration tests for drugs and toxics, and the like.

(4) Immunological tests: Clinical immunological testing includes the testing of immunologic function, clinical serological testing and tumor markers etc.

(5) Testing for pathogens: The testing for common pathogens of infectious diseases, nosocomial infection, and sexually transmitted diseases, and the testing for bacterial drug resistance.

Diagnosis in Clinical genetics and clinical exfoliative cytology are excluded in this section.

4. Fields of applied laboratory diagnosis

Laboratory diagnosis has been traditionally used for clinical diagnosis, but as medical model develops from exclusive disease diagnosis to health care and prevention combined with medicine, its function and usage expands.

(1) Clinical work: It provides a scientific basis for diagnosing diseases, setting treatment plans, analyzing cases, observing treatment effects, and venturing prognoses.

(2) Offers basis for prevention work: It can be used for investigation of disease, and in this way we can find out the source of infectious diseases and various pathogenic factors, harmful to human body, as early as possible, aiming to provide significant data for taking prevention measures and controlling transmission of infectious diseases.

(3) Carry out social survey: It can be used to evaluate the sanitation status and health level of social groups. Thus potential diseases and genetic diseases can be detected in time, helping to set health guidelines, promote initiatives in prevention and treatment of diseases, protect surrounding sanitation, arrange the set-up of health-care institutes.

(4) Carry out health consultation: Basic clinical laboratory testing can provide social groups with health consultations, helping them to be healthy, reduce the possibility of sickness, develop a

suitable regimen, and extend life span. It can also offer a laboratory basis to family planning, healthy parturition and scientific nurture.

5. The current situation and trends in laboratory diagnosis

In recent years, as theory and technology of basic medical disciplines and interdisciplines advance rapidly, their relationship with clinical laboratory gets closer day by day and they intertwine each other more deeply. Testing methods and components becoming more abundant, there comes into being a new and independent science laboratory diagnosis course. Various modern precision instruments and equipments produced in China or abroad, change clinical laboratory testing day by day. Manual work gives way to fast and highly automatized analysis; chemical qualitative test develops into high-precision quantitative test; testing of a single item through constant sample/macroanalysis changes into testing of many items through trace or even ultra-trace samples; blood samples testing progress to non-invasive detection for certain items such as testing through skin; single item analysis advances into multiple analysis through biological information networks. The research and promotion of testing for substances with high, difficult, new and sophisticated technology makes testing items more full-scale and diagnosis level higher. Thus clinical laboratory testing has become a discipline which develops fast and thrives with high, new and sophisticated technologies. For the time being, workers in this field strive to make full use of biological information in the post-genomic era to offer rapid diagnoses.

6. The methods and requirements for study

The course of laboratory diagnosis is set between basic courses and clinical ones, where students concentrate on conceptual, general and practical ideas in medical laboratory sciences before they lay emphasis on specialized, professional and complicated aspects later at the stages of clinical teaching and continuous teaching. At this stage, students are required to master factors influencing various tests, reference ranges of various testing items and their clinical meaning, and also clinical thinking—they can combine the test results with other clinical data to analyze, diagnose, prevent and cure.

II. The collection and processing of specimens

1. The collection and processing of blood specimen

(1) Classification of blood specimen

- 1) Whole blood to be used for the testing of blood cells component;
- 2) Serum is to be used for most clinical biological tests and immunological tests;
- 3) Plasma can be used for certain clinical biological tests, and the coagulation factor testing.

The free hemoglobin test must use plasma samples.

(2) Blood collection sites

- 1) Capillaries: This is mainly used for bedside and emergency testing, whose results are representative of part of the body and have to be taken into account when compared with results of specimen reflecting the information pertaining to the whole body. Puncture can be done at the finger tips for adults, thumbs and heel for infants and unaffected skin for burn patients. The puncture sites