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全国高等学校教材　英文版

供基础、临床、预防、口腔医学类专业用

# 实验诊断学

# Textbook of Laboratory Diagnostics

主　编　Chief Editor

王鸿利 (Wang Hongli)

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PEOPLE'S MEDICAL PUBLISHING HOUSE

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# Textbook of Laboratory Diagnostics


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# 全国高等学校临床医学专业规划教材
# “英文版”出版说明

2001 年 8 月，教育部制定并下发《关于加强高等学校本科教学工作提高教学质量的若干意见》（教高〔2001〕4 号），指出：按照“教育面向现代化、面向世界、面向未来”的要求，为适应经济全球化和科技革命的挑战，本科教育要创造条件使用英语等外语进行公共课和专业课教学。对高新技术领域的生物技术、信息技术等专业，更要先行一步，力争三年内，外语教学课程达到所开课程的 5%～10%。2005 年 1 月，又印发了《关于进一步加强高等学校本科教学工作的若干意见》（教高〔2005〕1 号），指出：高等学校要全面推广和使用大学英语教学改革的成果，要提高双语教学课程的质量，继续扩大双语教学课程的数量。要加强教材建设，确保高质量教材进课堂。

双语教育是提高学生英语水平的一个途径，尽管我国高等医学院校双语教学探索已有若干年，但教材的跟进始终显得滞后。没有合适的教材是目前双语教学面临的困难之一。2006 年初，为推进双语教学的发展，经全国高等医药教材建设研究会和卫生部教材办公室审议，决定根据国家、地方和学生未来发展的需要，组织国内专家结合双语教学的经验，编写出版一套适应当前双语教学现状的教材。

此套教材的特点在于：

- 汇集名师。各教材主编均由卫生部规划的五年制、八年制教材的主编担任。
- 适合国情。教材的编写内容和体系主要参考我国医学院校长期使用并多次修订的五年制、八年制规划教材，更符合我国的教学模式。
- 语言纯正。根据引进的经典英文原版教材改编，聘请国外作者或编辑参与审校工作。
- 篇幅适中。由于双语教学的课时数有限，因此在编写时只选取各门学科需要重点掌握的内容（占中文教材内容的 1/2～2/3）进行编写，也可减轻学生的负担。
- 丰富的教辅资源。教辅资源一直是外版教材的核心资源，因此，在本套教材编写的同时，我社引进了国外畅销的系列案例教材《Case Files》，以配合教学使用。
- 制作精美。为满足广大读者的阅读需要，全套教材采用双色印刷，图文并茂，版式清新美观。

本套教材共 16 种，全部为卫生部“十一五”规划教材。全套教材将于 2007 年秋季和 2008 年春季分两批出版发行。可供各医学院校针对五年制、七年制、八年制等不同层次学生开展双语教学使用。

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# 前　言

根据卫生部教材办公室、人民卫生出版社医学教育出版中心关于编写全国高等学校临床医学专业卫生部规划英文版教材的要求，我们组织了具有丰富教学与临床经验的、英语水平较高的实验诊断学教授摘编了英文版《实验诊断学》。

英文版《实验诊断学》以人民卫生出版社出版的八年制中文版《实验诊断学》（2005年）为编排主线，内容摘自Lippincott Williams & Wilkins公司出版的第二版 *Clinical Laboratory Medicine*，既保持原著风格，又做到“洋为中用”，力求教材简洁、实用。

全书共34章，涵盖实验室检查标准化（第1章）、分子生物学实验诊断（第2章）、临床血液学实验诊断（第3～6章）、临床生物化学实验诊断（第7～19章）、临床免疫学实验诊断（第20～24章）、临床遗传学实验诊断（第25章）、临床病原学实验诊断（第26～32章）和血液尿液一般检查（第33～34章），与中文版可配套使用。

本教材可供临床医学专业八年制（七年制）和五年制学生使用，主要目的为帮助学生规范专业英语，同时了解国外实验诊断学在临床医学领域中的应用，因此本书对临床各级医师也具一定的参考价值。

根据出版要求，我们将原著中的计量单位换算成我国法定计量单位，而检测项目的参考值仍与我国有一定差异，在学习和应用中需加以注意。

尽管编者们兢兢业业，努力工作，但在摘编过程中仍难免有欠妥或错误之处，敬请读者提出宝贵意见，以便再版时更正。

编　者

2007．6

# Preface

This first edition textbook has its roots in the second edition published in 2001 as ***Clinical Laboratory Medicine*** by Kenneth D. McClatchey.

Clinical pathology and laboratory medicine contribute more hard scientific objective data and information to a patient's medical care and medical record and database than any other single source. The most use of clinical laboratory measurement and examinations today (approximately two thirds) is in clinical and therapeutic management and monitoring, with the remainder used mostly for confirming or ruling out a diagnosis, followed by case finding or screening to detect disease or risk factors to promote health; last, such determination are used for assessment of prognosis or magnitude or extent of existing disease. Over the past decade, an explosion in biomedical information and technology, and the new biology of medicine (cell and molecular biology, genetics, immunology, and reproductive biology) have been translated into patient care primarily through the clinical laboratory. This textbook will sustain and assist students, physicians, medical technologists, and others in this era of laboratory medicine that has been undergoing change as a result of the biomedical information explosion and health care reform in a competitive, regulated, and resource-limited environment. It also includes: encompasses the new biology of medicine manifest primarily in molecular technology (chapter 2); clinical cytogenetics (chapter 25 ); immunopathology (chapter 20 to chapter 24); clinical chemistry (chapter 7 to chapter 19); hematology, coagulation, and transfusion medicine (chapter 3 to chapter 6); medical microbiology (chapter 26 to chapter 32 ); urine and other body fluids (chapter 33 and chapter 34). This edition begins in chapter one with its organization, purpose, and practice, that is, operation management so crucial to laboratory service.

This approach in chapters assists not only virtually post/undergraduate medical students, medical technology students, especially primary care physicians and pathologists, and medical education trainees. Although individual authors deserve full credit for their contribution, we accept full responsibility for any errors of omission or commission and enthusiastically welcome any comments, reaction, or suggestions regarding this textbook to make the next edition even better.

**The Authors**

April 15, 2007

# Contents

# Chapter 1 General of Clinical Laboratory

## Principles to Clinical Laboratory

Clinical laboratory or medical laboratory is intended to be inclusive and cover all institutions providing a pathology service or performing tests on specimens from human beings. It is for the biological, microbiological, immunological, chemical, immunohematological, hematological, biophysical, cytological, pathological, or other testing of materials derived from the human body for the purpose of providing information for the diagnosis, prevention, treatment of disease or the assessment of the health of human beings.

## Responsibilities

Medical laboratories have responsibilities to three main groups:

### The Patient

Medical laboratory professionals are accountable for the quality and integrity of the services they provide.This obligation includes maintaining individual competence and endeavoring to protect the patient from incompetent or illegal practices by others.

### Colleagues and the Profession

Medical laboratory professionals should strive to uphold the dignity and respect of their professions and maintain a reputation for honesty, integrity, and reliability. They should aim to contribute to the advancement of the profession by improving the body of scientific knowledge, promoting high standards of education and practice, and collaborating with colleagues and other health professionals where practicable.

### Society

Professionals working in a medical laboratory also have a responsibility to contribute to the general well-being of society. This may be within their sphere of professional competence or simply as members of the community.

Medical professionals should comply with relevant laws and regulations pertaining to their professional activities. The medical profession is committed to a high standard of care and practice, and professionals should endeavor, to a reasonable extent, to influence those that do not meet this standard.

## Collection of Information

Laboratories must collect sufficient information to identify adequately patients and specimens. They also should collect sufficient information for other legitimate purposes, but unnecessary information should not be collected. If possible, there should be sufficient clinical information to enable the test to be correctly interpreted. Legitimate concerns may also involve information relevant to the safety of other patients and staff as well as information required for billing purposes and resource management including utilization reviews. The patient should be aware of the information collected and the purpose for which it

is collected.

## Collection of Specimens

All procedures carried out on competent patients require their informed consent. Where the patient is incompetent by reason, for example, of age or mental state, consent may be given by the parents or a properly authorized person. In exceptional circumstances when this is not possible, necessity may justify the procedure when it is clearly in the best interests of the patient that the procedure be performed. For most routine laboratory procedures, consent can be inferred when the patient presents at a laboratory and willingly submits to the usual collecting procedures, e.g., venepuncture.However, certain procedures, especially the more invasive procedures (e.g., bone marrow aspiration) will require a more detailed explanation of their risks before consent being given. Some tests, e.g., certain genetic testing will require special pretest counseling to ensure that the patient fully understands the implications of the test result.

Adequate privacy for the patient must be made available.It should be appropriate for the type of specimens (or information) being collected and be sensitive to the cultural expectations of the patient and the resources available.

## Performance of the Test

All tests will be carried out to an appropriate standard that should be determined in detail by professional organizations or regulatory authorities. Accreditation programs designed to promote standards and ensure compliance are to be encouraged. Where no such guidance is available, the patient's interests will prevail. In some situations, this may mean that a laboratory should refuse to attempt a test rather than produce an unreliable result that could result in harm being done to the patient. All laboratory work will be carried out with the high level of skill and competence expected of the medical, scientific, and allied health professions.

## Reporting of Results

Test results are confidential unless disclosure is authorized. They will normally be reported to the clinician who requested the tests and may be reported to other parties with the patient's consent or as required by law. Decisions concerning implied consent for the reporting of results to other involved practitioners (e.g., consultant practitioners to whom the patient has been referred) should be made carefully, taking into account local customs. The laboratory should have written procedures detailing how various requests are handled, and this information should be made available to patients on request. The laboratory is also responsible for taking all reasonable precautions to ensure that the method of transmitting results to requesting clinicians or other authorized persons is secure and reliable. This applies whether the method used is by courier, public post, or electronic means. The laboratory also has a responsibility to ensure that the turnaround time for results is reasonable taking into account the type of test and the patient's condition. There should be the facility to report urgent results as soon as they are available.

In addition to the accurate and timely reporting of test results, the laboratory has an additional responsibility to ensure that, as far as possible, the results are correctly interpreted and applied in the patient's best interests. Care must be given to the construction and format of the report to facilitate correct interpretation and diagnosis. When appropriate, a pathologist or some other competent professional should be available to discuss results. Consultation with regard to the selection and interpretation of tests is part of a medical laboratory service.