

(第2版)

临床血脂学

—Braunwald 心脏病学姊妹卷

CLINICAL LIPIDOLOGY

A Companion to Braunwald's Heart Disease

原著 CHRISTIE M. BALLANTYNE
主译 胡大一

ELSEVIER



北京大学医学出版社

(第2版)

临床血脂学



——Braunwald 心脏病学姊妹卷

CLINICAL LIPIDOLOGY

A Companion to Braunwald's Heart Disease

原著 Christie M. Ballantyne
主译 胡大一

北京大学医学出版社

LINCHUANG XUEZHIXUE (DI ER BAN) —— Braunwald XINZANGBINGXUE ZIMEI JUAN

图书在版编目 (CIP) 数据

临床血脂学: 第2版: Braunwald 心脏病学姊妹卷/
(美) 克里斯提·布兰太原著; 胡大一主译. —北京:
北京大学医学出版社, 2017. 2

书名原文: Clinical Lipidology: A Companion to
Braunwald's Heart Disease, 2nd Edition

ISBN 978-7-5659-1525-3

I. ①临… II. ①克… ②胡… III. ①高脂血症—防
治 IV. ①R589. 2

中国版本图书馆 CIP 数据核字 (2016) 第 304417 号

北京市版权局著作权合同登记号: 图字: 01-2016-7075

ELSEVIER

Elsevier (Singapore) Pte Ltd.

3 Killiney Road, #08-01 Winsland House I, Singapore 239519

Tel: (65) 6349-0200; Fax: (65) 6733-1817

Clinical Lipidology: A Companion to Braunwald's Heart Disease, 2/E

Christie M. Ballantyne

Copyright © 2015, 2009 by Saunders, an imprint of Elsevier Inc. All rights reserved.

ISBN-13: 9780323287869

This translation of Clinical Lipidology: A Companion to Braunwald's Heart Disease, 2/E by Christie M. Ballantyne was undertaken by Peking University Medical Press and is published by arrangement with Elsevier (Singapore) Pte Ltd.

Clinical Lipidology: A Companion to Braunwald's Heart Disease, 2/E by Christie M. Ballantyne 由北京大学医学出版社进行翻译, 并根据北京大学医学出版社与爱思唯尔 (新加坡) 私人有限公司的协议约定出版。

《临床血脂学 (第2版) ——Braunwald 心脏病学姊妹卷》(胡大一译)

ISBN: 978-7-5659-1525-3

Copyright © 2017 by Elsevier (Singapore) Pte Ltd. and Peking University Medical Press.

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage and retrieval system, without permission in writing from Elsevier (Singapore) Pte Ltd. Details on how to seek permission, further information about the Elsevier's permissions policies and arrangements with organizations such as the Copyright Clearance Center and the Copyright Licensing Agency, can be found at our website: www.elsevier.com/permissions.

This book and the individual contributions contained in it are protected under copyright by Elsevier (Singapore) Pte Ltd. and Peking University Medical Press (other than as may be noted herein).

Notice

This publication has been carefully reviewed and checked to ensure that the content is as accurate and current as possible at time of publication. We would recommend, however, that the reader verify any procedures, treatments, drug dosages or legal content described in this book. Neither the author, the contributors, the copyright holder, nor the publisher assume any liability for injury and/or damage to persons or property arising from any error in or omission from this publication.

Published in China by Peking University Medical Press under special arrangement with Elsevier (Singapore) Pte Ltd. This edition is authorized for sale in the People's Republic of China only, excluding Hong Kong SAR, Macau SAR and Taiwan. Unauthorized export of this edition is a violation of the contract.

临床血脂学 (第2版) ——Braunwald 心脏病学姊妹卷

主 译: 胡大一

出版发行: 北京大学医学出版社

地 址: (100191) 北京市海淀区学院路38号 北京大学医学部院内

电 话: 发行部 010-82802230; 图书邮购 010-82802495

网 址: <http://www.pumppress.com.cn>

E-mail: booksale@bjmu.edu.cn

印 刷: 北京佳信达欣艺术印刷有限公司

经 销: 新华书店

责任编辑: 高 瑾 武翔靓 阳耀林 责任校对: 金彤文 责任印制: 李 啸

开 本: 889mm×1194mm 1/16 印张: 38.75 插页: 8 字数: 1216千字

版 次: 2017年2月第1版 2017年2月第1次印刷

书 号: ISBN 978-7-5659-1525-3

定 价: 228.00元

版权所有, 违者必究

(凡属质量问题请与本社发行部联系退换)

(第2版)

临床血脂学



——Braunwald 心脏病学姊妹卷

CLINICAL LIPIDOLOGY

A Companion to Braunwald's Heart Disease

注 意

这一领域的知识和临床实践在不断进步。由于新的研究与临床经验不断扩展着我们的知识，有必要在研究、专业实践和治疗方面做出适当的改变。

实践者和研究者在评价和使用本书提供的信息、方法、资料和经验的时候，必须将其建立在自身经验和知识的基础上。在应用这些信息或方法时，读者必须注意确保自身和他人的安全，包括其所负责的患者的安全。

建议读者核对每种药品的生产厂家所提供的最新产品信息（包括产品特性、使用方法），确认药物的推荐剂量、服用方法、持续时间及禁忌证。根据自己的经验和患者的病情对每一位患者做出诊断，决定服药剂量和最佳治疗方法，并注意用药安全是主治医生的责任。

不论是出版商、著作者、合著者还是编辑，对于因本出版物引起的任何个人或财产的损伤和（或）损失，均不承担任何责任。

译者名单

(按姓名汉语拼音排序)



- 何婧瑜 (首都医科大学宣武医院)
胡大一 (北京大学人民医院)
胡少东 (首都医科大学宣武医院)
李 双 (首都医科大学附属北京友谊医院)
李碧汐 (首都医科大学宣武医院)
李博宇 (首都医科大学宣武医院)
李金娟 (北京大学首钢医院)
刘东霞 (河北省人民医院)
刘力松 (北京和睦家医院)
刘立君 (北京博爱医院)
刘宣雨 [普瑞基准科技(北京)有限公司]
逯春鹏 (北京华信医院)
王 颖 (河北省人民医院)
王长远 (首都医科大学宣武医院)
王建旗 (首都医科大学附属北京同仁医院)
魏占云 (首都医科大学宣武医院)
吴靖林 (北京和睦家医院)
杨 伟 (首都医科大学宣武医院)
张艳红 (首都医科大学宣武医院)
周培明 (首都医科大学附属北京友谊医院)

原著致谢



感谢家人——我的夫人兼伙伴亚丝明（Yasmine），我的女儿莱拉（Leyla）、克莉丝汀（Christina）和卡蒂娜（Katina），我的父母、姐妹和兄弟，还有朋友，对我职业生涯自始至终的支持，尤其是我不在他们身边的日子里。

感谢激励我在预防心脏病学领域进行学术追求的人们：唐纳德·塞尔丁（Donald Seldin）鼓励我开展教学工作，吉姆·威勒森（Jim Willerson）是努力工作和为患者奉献的典范；亚特·博德特（Art Beaudet），对科学方法和批判性思维始终坚持严谨的态度；托尼·戈托（Tony Gotto），是集临床医生、科学家、教育工作者、父亲和管理者于一身的典范。

感谢所有我的同事和学生，他们与我分享了生命中的时光，我们一起从事研究工作、一起照护患者。

感谢我的患者及世界各地有血脂异常和动脉粥样硬化的人们，希望本书能减少他们的痛苦，防止其过早死于心血管疾病。

最后，我还想要感谢克丽·杰拉（Kerrie Jara），她为本书第2版的出版付出了巨大的心血。

原著名单



Ashok Balasubramanyam, M.D.

Professor of Medicine and Molecular and Cellular Biology,
Baylor College of Medicine, Houston, Texas

Christie M. Ballantyne, M.D.

Professor of Medicine, Genetics, and Physiology, Chief,
Section of Cardiovascular Research, Chief, Section of
Cardiology, Department of Medicine, Baylor College of
Medicine; Director, Center for Cardiovascular Disease
Prevention, The Methodist DeBakey Heart and Vascular
Center, Houston, Texas

Philip J. Barter, M.B.B.S., Ph.D.

Professor, Centre for Vascular Research, Lowy Cancer
Research Centre, University of New South Wales, Sydney,
Australia

Roger S. Blumenthal, M.D.

Professor of Medicine and Director, Johns Hopkins
Ciccarone Preventive Cardiology Center, Johns Hopkins
University, Baltimore, Maryland

Michael B. Boffa, Ph.D.

Associate Professor, Department of Chemistry and
Biochemistry, University of Windsor, Windsor, Ontario,
Canada

Bryan Brewer, Jr., M.D.

Director, Washington Cardiovascular Associates; Senior
Research Consultant, Lipoprotein and Atherosclerosis
Research, Cardiovascular Research Institute, Medstar
Health, Washington, D.C.

Eliot A. Brinton, M.D., FAHA, FNLA.

Director, Atherometabolic Research Utah Foundation for
Biomedical Research, President, Utah Lipid Center, Salt
Lake City, Utah

Julie A. Brothers, M.D.

Assistant Professor, Pediatrics, Perelman School of Medicine
at the University of Pennsylvania; Attending Physician,
Cardiology, Medical Director, Lipid Heart Clinic, The
Children's Hospital of Philadelphia, Philadelphia,
Pennsylvania

Lars A. Carlson, M.D., Ph.D., FRCP Edin

King Gustaf V Research Institute, Karolinska Institutet,
Stockholm, Sweden

Alberico L. Catapano, Ph.D.

Professor of Pharmacology, Department of Pharmacological
and Biomolecular Sciences, University of Milan, I.R.C.C.S.
MULTIMEDICA Hospital, Milan, Italy

Laura Chiavaroli, M.Sc., Ph.D.(c)

Faculty of Medicine, Department of Nutritional Sciences,
University of Toronto; Clinical Nutrition and Risk Factor
Modification Center, St. Michael's Hospital, Toronto,
Ontario, Canada

Timothy S. Church, M.D., M.P.H., Ph.D.

Professor, Preventive Medicine Laboratory, Pennington
Biomedical Research Center, Baton Rouge, Louisiana

David E. Cohen, M.D., Ph.D.

Director, Hepatology, Division of Gastroenterology, Brigham
and Women's Hospital; Director, Harvard-MIT Division of
Health Sciences and Technology; Robert H. Ebert Professor
of Medicine and Health Sciences and Technology, Harvard
Medical School, Boston, Massachusetts

Julia C. Creider, Hon B.MSc., M.D.

Resident, Internal Medicine, Schulich School of Medicine
and Dentistry, Western University, London, Ontario, Canada

Stephen R. Daniels, M.D., Ph.D.

Professor and Chairman, Department of Pediatrics,
University of Colorado School of Medicine; Pediatrician-in-
Chief, Children's Hospital Colorado, Aurora, Colorado

David J. Davidson, M.D.

Department of Medicine, University of Chicago, Chicago,
Illinois

Michael H. Davidson, M.D.

Professor, Section of Cardiology, Department of Medicine,
The University of Chicago Pritzker School of Medicine,
Chicago, Illinois

Prakash Deedwania, M.D., FACC, FACP, FAHA

Professor of Medicine, Cardiology, University of California-
San Francisco Program at Fresno; Chief, Cardiology Division
Medicine, VACCHCS, Fresno, California

Emil M. deGoma, M.D.

Division of Cardiovascular Medicine, Perelman School of
Medicine at the University of Pennsylvania, Philadelphia,
Pennsylvania

Rose Q. Do, M.D.

Assistant Professor of Medicine, University of Colorado
School of Medicine; Staff Cardiologist, VA Medical Center,
Denver, Colorado

Zahi A. Fayad, Ph.D.

Director, Translational and Molecular Imaging Institute;
Professor of Radiology and Medicine (Cardiology), Mount
Sinai School of Medicine, New York, New York

Sergio Fazio, M.D., Ph.D.

The William and Sonja Connor, Chair of Preventive Cardiology, Professor of Medicine, Director, Center of Preventive Cardiology, Knight Cardiovascular Institute, Oregon Health and Science University, Portland, Oregon

Bengt Fellström, M.D., Ph.D.

Professor of Nephrology, University of Uppsala, Uppsala, Sweden

Jennifer Fleming, M.S., RD, LDN.

Clinical Research Coordinator, Department of Nutritional Sciences, The Penn State University, University Park, Pennsylvania

Baiba K. Gillard, Ph.D.

Research Scientist, Cardiology, Houston Methodist Research Institute, Houston, Texas

Henry N. Ginsberg, M.D.

Herbert and Florence Irving Professor of Medicine and Director, Irving Institute for Clinical and Translational Research, Division of Preventive Medicine and Nutrition, Department of Medicine, Columbia University College of Physicians and Surgeons, New York, New York

Anne Carol Goldberg, M.D.

Associate Professor of Medicine, Washington University School of Medicine, St. Louis, Missouri

Antonio M. Gotto, Jr., M.D., D.Phil.

Dean Emeritus and Co-Chairman of the Board of Overseers and Lewis Thomas University Professor, Weill Cornell Medical College, New York, New York; Vice President and Provost for Medical Affairs Emeritus, Cornell University, Ithaca, New York

John R. Guyton, M.D.

Associate Professor of Medicine, Division of Endocrinology, Metabolism, and Nutrition, Department of Medicine, Duke University Medical Center, Durham, North Carolina

William S. Harris, Ph.D.

Professor, Department of Medicine, Sanford School of Medicine, University of South Dakota, Sioux Falls, South Dakota; President, OmegaQuant Analytics, Sioux Falls, South Dakota; Senior Research Scientist, Health Diagnostic Laboratory, Inc., Richmond, Virginia

Robert A. Hegele, M.D., FRCPC, FACP

Distinguished University Professor, Medicine and Biochemistry, Schulich School of Medicine, University of Western Ontario, London, Ontario, Canada

Hallvard Holdaas, M.D., Ph.D.

Department of Transplant Medicine, Oslo University Hospital, Rikshospitalet, Oslo, Norway

Ron C. Hoogeveen, Ph.D.

Section of Cardiovascular Research, Department of Medicine, Baylor College of Medicine, Houston, Texas

Terry A. Jacobson, M.D.

Professor, Department of Medicine, Director, Lipid Clinic and Cardiovascular, Risk Reduction Program, Emory University School of Medicine, Atlanta, Georgia

Alan G. Jardine, B.Sc., M.D., FRCP

Professor of Renal Medicine and Head of the School of Medicine, University of Glasgow, Glasgow, Scotland, United Kingdom

David J.A. Jenkins, M.D., Ph.D., DSc.

Faculty of Medicine, Department of Nutritional Sciences, University of Toronto; and Director, Clinical Nutrition and Risk Factor Modification Center; Division of Endocrinology; and Keenan Research Center of the Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, Ontario, Canada

Amber E. Johnson, M.D., MBA

John Hopkins, Ciccarone Center for the Prevention of Heart Disease, John Hopkins University, Baltimore, Maryland

Peter Jones, M.D.

The Richardson Centre for Functional Foods and Nutraceuticals, University of Manitoba, Manitoba, Canada

Peter H. Jones, M.D.

Associate Professor of Medicine, Division of Atherosclerosis and Vascular Medicine, Section of Cardiovascular Research, Department of Medicine, Baylor College of Medicine, Houston, Texas

John J.P. Kastelein, M.D., Ph.D.

Department of Vascular Medicine, Academic Medical Center Amsterdam, Amsterdam, The Netherlands

Cyril W.C. Kendall, M.D.

Faculty of Medicine, Department of Nutritional Sciences, University of Toronto; Clinical Nutrition and Risk Factor Modification Center, St. Michael's Hospital, Toronto, Ontario, Canada; College of Pharmacy and Nutrition, University of Saskatchewan, Saskatoon, Saskatchewan, Canada

Jon Kobashigawa, M.D.

DSL/Thomas D. Gordon Chair in Heart Transplantation Medicine, Associate Director, Cedars-Sinai Heart Institute, Director, Advanced Heart Disease Section, Director, Heart Transplant Program, Cedars-Sinai Medical Center, Los Angeles, California

Marlys L. Koschinsky, Ph.D.

Dean, Faculty of Science; Professor, Chemistry and Biochemistry, University of Windsor, Windsor, Ontario, Canada

Penny M. Kris-Etherton, Ph.D., RD.

Distinguished Professor of Nutrition, Department of Nutritional Sciences, The Pennsylvania State University, University Park, Pennsylvania

Jan Albert Kuivenhoven, Ph.D.

Molecular Genetics, University of Groningen, University Medical Center, Groningen, The Netherlands

Olivier Lairez, M.D., Ph.D.

Translational and Molecular Imaging Institute, Icahn School of Medicine at Mount Sinai, New York, New York; Cardiac Imaging Center, University Hospital of Rangueil, Toulouse, France

Carl J. Lavie, M.D., FACC, FACP, FCCP

Medical Director, Cardiac Rehabilitation, Department of Cardiovascular Disease John Ochsner Heart and Vascular Institute, New Orleans, Louisiana; Department of Preventive Medicine, Pennington Biomedical Research Center, Baton Rouge, Louisiana

Peter Libby, M.D.

Malinckrodt Professor of Medicine, Harvard Medical School, Chief Cardiovascular Division, Brigham and Women's Hospital, Boston, Massachusetts

MacRae F. Linton, M.D.

Stephen and Mary Schillig Professor of Medicine and Pharmacology, Cardiovascular Medicine Division; Director, Vanderbilt Lipid Clinic, Vanderbilt University School of Medicine, Nashville, Tennessee

Santica M. Marcovina, Ph.D., ScD

Research Professor of Medicine, University of Washington, Director, Northwest Lipid Metabolism and Diabetes Research Laboratories, Seattle, Washington

Patrick B. Mark, M.B.Ch.B., Ph.D., FRCP

Senior Lecturer in Nephrology, University of Glasgow, Glasgow, Scotland, United Kingdom

Seth S. Martin, M.D.

Fellow, Cardiology; Fellow, Ciccarone Center for the Prevention of Heart Disease Johns Hopkins University, Baltimore, Maryland

Mark E. McGovern, M.D., FACC, FACP

Miami, Florida

James M. McKenney, PharmD

President and CEO, National Clinical Research, Inc; Professor Emeritus Virginia Commonwealth University, Richmond, Virginia

Michael Miller, M.D.

Professor of Medicine and Epidemiology and Public Health, University of Maryland School of Medicine; Director, Center for Preventive Cardiology, University of Maryland Medical Center, Baltimore, Maryland

Yury I. Miller, M.D., Ph.D.

Professor, Department of Medicine, University of California, San Diego, San Diego, California

Arash Mirrahimi, B.Sc., M.Sc.

Medical Student, School of Medicine, Faculty of Health Sciences, Queen's University, Kingston, Ontario, Canada; Research Associate, Department of Nutritional Sciences, Faculty of Medicine, University of Toronto; Research Associate, Clinical Nutrition and Risk Factor Modification Center, St. Michael's Hospital, Toronto, Ontario, Canada

Jennifer E. Moon, Ph.D.

Weill Cornell Medical College, New York, New York

Patrick M. Moriarty, M.D.

Professor of Medicine, Director of Clinical Pharmacology/Atherosclerosis and Lipoprotein-Apheresis Center, University of Kansas Medical Center, Kansas City, Kansas

Mohammad Mahdi Motazacker, Ph.D.

Department of Clinical Genetics, Academic Medical Center, Amsterdam, The Netherlands

Vijay Nambi, M.D., Ph.D.

Staff Cardiologist, Medicine, Michael E. DeBakey Veterans Affairs Hospital; Assistant Professor, Division of Atherosclerosis and Vascular Medicine, Section of Cardiovascular Research, Medicine, Baylor College of Medicine, Houston, Texas

Smita I. Negi, M.D.

Fellow, Division of Cardiology, Medstar Washington Hospital Center, Washington, D.C.

Stephen J. Nicholls, M.D., Ph.D.

Professor of Cardiology and SAHMRI Heart Foundation Heart Disease Theme Leader, South Australian Health & Medical Research Institute, Adelaide, Australia

Steven E. Nissen, M.D.

Chair, Department of Cardiovascular Medicine, The Cleveland Clinic Foundation, Cleveland, Ohio

Giuseppe D. Norata, Ph.D.

Department of Pharmacological and Biomolecular Sciences, University of Milan, Milan, Italy

Payal S. Patel, M.D.

Baylor College of Medicine, Division of Endocrinology, Diabetes and Metabolism, Baylor College of Medicine, Houston, Texas

Rajan K. Patel, M.B.Ch.B., Ph.D.

Lecturer in Nephrology and Transplantation, ICAMS, University of Glasgow, Glasgow, Scotland, United Kingdom

F. Xavier Pi-Sunyer, M.D., M.P.H.

Professor of Medicine, and Co-Director, New York Obesity/Nutrition Research Center, Columbia University, New York, New York

Yashashwi Pokharel, M.D., MSCR

Fellow of Lipid and Lipoprotein, Section of Cardiovascular Research, Department of Medicine; Fellow of Lipid and Lipoprotein, Center for Cardiovascular Disease Prevention, Methodist DeBakey Heart and Vascular Center, Baylor College of Medicine, Houston, Texas

Henry J. Pownall, B.S., M.S., Ph.D.

Scientist, Department of Cardiology, Houston Methodist Research Institute, Houston, Texas

Frederick Raal, M.B., B.Ch., Ph.D.

Director, Carbohydrate and Lipid Metabolism Research Unit; Professor and Head, Division of Endocrinology and Metabolism, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

Daniel J. Rader, M.D.

Seymour Gray Professor of Molecular Medicine, Chair, Department of Genetics Chief, Division of Translational Medicine and Human Genetics, Department of Medicine, Perelman School of Medicine, The University of Pennsylvania, Philadelphia, Pennsylvania

Gisette Reyes-Soffer, M.D.

Assistant Professor of Medicine, Division of Preventive Medicine and Nutrition, Department of Medicine, Columbia University College of Physicians and Surgeons, New York, New York

Paul M. Ridker, M.D.

Eugene Braunwald Professor of Medicine, Harvard Medical School; Director, Center for Cardiovascular Disease Prevention, Division of Preventive Medicine, Brigham and Women's Hospital, Boston, Massachusetts

Corina Rosales, M.S., Ph.D.

Postdoctoral Fellow, Cardiology, Houston Methodist Research Institute, Houston, Texas

Robert S. Rosenson, M.D.

Professor of Medicine and Director of Cardiometabolic Disorders, Icahn School of Medicine at Mount Sinai, New York, New York

Eli M. Roth, M.D., FACC

Adjunct Professor of Clinical Medicine, Division of Cardiovascular Health and Disease, University of Cincinnati Medical Center; President and Medical Director, Sterling Research Group, Cincinnati, Ohio

Kerry-Anne Rye, Ph.D., FAHA.

Professor, Centre for Vascular Research, University of New South Wales, Sydney, New South Wales, Australia

Raul D. Santos, M.D., Ph.D.

Associate Professor of Cardiology, University of Sao Paulo Medical School; Director, Lipid Clinic, Heart Institute (InCor), University of Sao Paulo Medical School Hospital, Sao Paulo, Brazil

Mark A. Sarzynski, Ph.D.

Assistant Professor-Research, Human Genomics Laboratory, Pennington Biomedical Research Center, Baton Rouge, Louisiana

Gregory G. Schwartz, M.D., Ph.D.

Chief, Cardiology Section, VA Medical Center; Professor of Medicine, Division of Cardiology, University of Colorado School of Medicine, Aurora, Colorado

Rajagopal V. Sekhar, M.D.

Associate Professor of Medicine, Translational Metabolism Unit, Division of Diabetes, Endocrinology, and Metabolism, Baylor College of Medicine, Houston, Texas

Parmanand Singh, M.D.

Assistant Professor of Medicine, Department of Medicine, Division of Cardiology, Weill Cornell Medical College, New York Presbyterian Hospital, New York, New York

Ann C. Skulas-Ray, Ph.D.

Research Associate, Department of Nutritional Sciences, The Pennsylvania State University, University Park, Pennsylvania

Kristie Srichaikul, M.Sc.

Faculty of Medicine, University of Ottawa, Ottawa, Ontario, Canada

Diana M. Stafforini, Ph.D.

Research Professor, Division of Cardiovascular Medicine, Department of Internal Medicine, Investigator, Huntsman Cancer Institute, University of Utah School of Medicine, Salt Lake City, Utah

Evan A. Stein, M.D., Ph.D.

Metabolic and Atherosclerosis Research Center; Voluntary Professor, Pathology and Laboratory Medicine, University of Cincinnati, Cincinnati, Ohio

Neil J. Stone, M.D., MACP, FACC, FAHA

Bonow Professor of Medicine, Medicine (Cardiology), Northwestern's Feinberg School of Medicine, Chicago, Illinois

Damon L. Swift, Ph.D.

Assistant Professor, College of Health and Human Performance, Department of Kinesiology, East Carolina University, Greenville, North Carolina

Ahmed Tawakol, M.D.

Director, Integrative Biomedicine Trials Program, Co-Director, Cardiac MR-PET-CT Program, Massachusetts General Hospital Harvard Medical School, Boston, Massachusetts

Allen J. Taylor, M.D.

Chief, Cardiology Division, Medstar Heart Institute, Medstar Georgetown University Hospital, Washington, D.C.

Sotirios Tsimikas, M.D., FACC, FAHA, FSCAI

Professor of Medicine and Director of Vascular Medicine, Division of Cardiovascular Diseases, Department of Medicine, University of California San Diego, La Jolla, California

Traci Turner, M.D.

Executive Director, Medpace Reference Laboratories and Metabolic and Atherosclerosis Research Center, Medpace, Cincinnati, Ohio

Krishnaswami Vijayaraghavan, M.D.

Vice President, Scottsdale Cardiovascular Center; Medical Director, CV Research, Scottsdale Healthcare; Professor of Medicine, Midwestern University, Scottsdale, Arizona

Salim S. Virani, M.D., Ph.D.

Staff Cardiologist and Investigator, Michael E. DeBakey Veterans Affairs Medical Center, Assistant Professor, Section of Cardiovascular Research, Department of Medicine, Baylor College of Medicine, Houston, Texas

David Q.-H. Wang, M.D., Ph.D.

Associate Professor of Medicine, Biochemistry and Molecular Biology, Division of Gastroenterology and Hepatology, Department of Internal Medicine, Saint Louis University School of Medicine, St. Louis, Missouri

Nanette K. Wenger, M.D., MACP, MACC, FAHA

Professor of Medicine, Division of Cardiology, Department of Medicine, Emory University School of Medicine, Atlanta, Georgia

Michael J. Wilkinson, M.D.

Resident, Medicine, University of Chicago, Chicago, Illinois

Julia M.W. Wong, Ph.D., RD.

Clinical Nutrition and Risk Factor Modification Centre, St. Michael's Hospital, Toronto, Ontario, Canada; New Balance Foundation Obesity Prevention Center, Boston Children's Hospital, Boston, Massachusetts

译者前言



动脉粥样硬化性心血管疾病（ASCVD）已成为全球和我国城乡居民的第一位死因，在我国占人口总死亡率的40%。正如本书主编 Christie M. Ballantyne 在第1版中所言，不同于癌症，心血管疾病如能应用当今已获取的知识和证据，及早预防，大多数 ASCVD 事件，尤其是早发 ASCVD 事件可防患于未然。在过去的30年中，我们一直在沿袭一种坐堂行医的传统，当坐堂医生，等人得病，即重治轻防、防治分家的落后的医学模式。针对疾病终末期实施的治疗所用支架数的快速攀升绝对不是医学的成就，而是医疗的失败！

危险因素学说的提出被证实是20世纪后半叶预防心脏病学领域最伟大的成就。其中，脂质、载脂蛋白和动脉粥样硬化血栓形成领域的基础医学、临床流行病学与临床医学研究成果转化为心血管病防控的实践。在众多发达国家，已看到生活方式改善和降低低密度脂蛋白水平的他汀类药物应用显著降低了致命性与非致命性心肌梗死、心血管疾病死亡率，不增加癌症等非心血管疾病死亡与风险，从而降低了总死亡率。而我国 ASCVD 二级预防中，坚持服用他汀类药物的患者仅1.7%，与非洲国家处在同一水平。用好已知的证据，实现临床血脂学已有研究成果的价值，我们需要更加努力工作。这不仅仅是学习知识，了解证据，还要对医学的目的加以调整，对整个医疗体制进行改革，同时，即使在一些严格管理随访的他汀强化干预的临床试验中，低密度脂蛋白下降至指南推荐目标的患者，心血管事件的残留风险仍较高。解决残留风险，除寻找其他新的危险因素外，脂质学领域还“存在相当大的争论、疑问和失败”，例如高密度脂蛋白胆固醇及脂蛋白（a）的故事远未讲完。

此外，在学习本书内容的过程中，我们还需注意的是，我国人群血脂异常的程度与特征不同于西方人群，用适度剂量的他汀治疗，低密度脂蛋白达标率就显著高于西方人群，而且，大多数患者难以耐受美国和欧洲指南推荐的广泛使用高强度大剂量他汀。在急性冠状动脉综合征和经皮冠状动脉成形术围术期突击使用阿托伐他汀40~80 mg 的“序贯疗法”，缺乏中国临床研究证据支持。以中小剂量他汀类药物起始，必要时联合使用依折麦布5~10 mg 是适合我国国情的用药方案，安全有效。在 ASCVD 的预防中，我们在借鉴西方国家的研究证据指南和经验的同时，一定要有学术自信和临床实践自信，坚持穿“中国鞋”，走“中国路”。积累中国高水平研究证据，写好、落实中国指南，讲好中国故事。

《临床血脂学》是 Braunwald 心脏病学体系的一本分支学术专著，其作者团队汇集了国际上这一领域造诣深、水平高的专家学者。第2版更是体现了近5年来血脂领域的最新进展，它不但高度总结、概括了人类对血脂学研究的科学成就，并且注意贴近临床。这是理论与实践结合而产生的一本优秀的血脂异常防治的学术著作。

2016年10月

原著前言



在我职业生涯的初始阶段，有关血脂异常和动脉粥样硬化的临床治疗，主要是作为一种学术研究的追求，而目前业已成为所有医疗从业者治疗和预防动脉粥样硬化血管性疾病的根本性措施。我坚信这本《临床血脂学（第2版）》，不仅对于心血管病学专科医生、内分泌学专科医生和内科医生，而且对治疗和预防动脉粥样硬化性心血管疾病感兴趣的所有医疗从业者来讲，都将是十分宝贵的资源。本书所提供的信息，体现了血脂和动脉粥样硬化研究的最新进展，其包含的实用临床治疗建议是独一无二的。

目 录

第一部分 基本机制

第一章	人血浆脂蛋白代谢	1
第二章	含脂蛋白的载脂蛋白 B 的调节和清除	13
第三章	肠道胆固醇和其他甾醇的吸收和排泄	29
第四章	高密度脂蛋白的代谢	48
第五章	脂蛋白：动脉粥样硬化形成及动脉粥样硬化血栓形成疾病进展的机制	60
第六章	罕见和常见遗传变异对脂蛋白代谢的影响	77
第七章	脂蛋白氧化：机制和生物治疗方法	89

第二部分 风险评估

第八章	胆固醇：浓度、比例和颗粒数量	103
第九章	高密度脂蛋白胆固醇和三酰甘油（甘油三酯）在冠心病危险评估中的作用	114
第十章	脂蛋白（a）	124
第十一章	血脂异常的遗传性和继发性病因的临床评估	144
第十二章	应用超敏 C 反应蛋白进行风险评估	153
第十三章	脂蛋白相关磷脂酶 A ₂ 在血管疾病中的作用	166
第十四章	新的检验方法	185
第十五章	心脏计算机化断层显像（CT）和颈动脉超声粥样硬化成像用于冠心病风险分层	195

第三部分 治疗

第十六章	低密度脂蛋白胆固醇升高、混合性血脂异常、甘油三酯升高和高密度脂蛋白胆固醇降低的一般治疗方法概述	208
第十七章	治疗指南的概述	212

第十八章	预防和治疗心血管疾病的饮食模式	223
第十九章	运动与脂类	238
第二十章	减肥	245
第二十一章	他汀类药物	256
第二十二章	胆汁酸螯合剂	293
第二十三章	胆固醇吸收抑制剂	301
第二十四章	烟酸（尼克酸）	311
第二十五章	贝特类	324
第二十六章	ω -3 脂肪酸	335
第二十七章	血脂异常的联合治疗	355
第二十八章	具有降脂作用的保健品和功能性食品	370
第二十九章	新治疗靶点：胆固醇酯转移蛋白抑制剂	382
第三十章	新治疗靶点：前蛋白转化酶枯草杆菌蛋白酶 9 抑制剂	393
第三十一章	新治疗靶点：炎症是预测和预防心血管事件的方法	406
第三十二章	有创影像技术与动脉粥样硬化：血管内超声	415
第三十三章	无创影像技术与动脉粥样硬化：超声的地位与作用	423
第三十四章	动脉粥样硬化无创性成像方法：磁共振成像（MRI）和正电子发射断层成像（PET）的作用	435
第三十五章	特殊患者群体：糖尿病和代谢综合征患者	452
第三十六章	特殊患者群体：妇女和老年人	472
第三十七章	特殊患者群体：儿童和青少年	482
第三十八章	特殊患者群体：家族性高胆固醇血症和其他严重高胆固醇血症患者	499
第三十九章	特殊患者群体：急性冠状动脉	

第一部分 基本机制

BASIC MECHANISMS

第一章 人血浆脂蛋白代谢

Human Plasma Lipoprotein Metabolism

Henry J. Pownall • Corina Rosales • Baiba K. Gillard • Jennifer E. Moon • Antonio M. Gotto, Jr. 著

任文林 译

脂蛋白 1	中密度脂蛋白和低密度脂蛋白 3	高密度脂蛋白-载脂蛋白 A-I 的
引言 1	高密度脂蛋白 3	稳定性和代谢 8
脂蛋白的构成和特性 1	脂蛋白重构和分解代谢 4	代谢综合征及相关问题 8
载脂蛋白 2	胆固醇逆向转运 4	高密度脂蛋白学说：高密度脂蛋白
脂蛋白的生成 2	卵磷脂-胆固醇酰基转移酶 5	治疗的两面性 8
富含三酰甘油（甘油三酯）的脂	脂质转移蛋白 5	未来的挑战 9
蛋白 2	脂质和脂蛋白代谢中的脂肪酶 6	参考文献 9

脂蛋白

引言

法国生理学家 Michel Macheboeuf 被公认为脂蛋白之父。他于 1928 年的开创性发现印证了科学理论先于技术应用的格言，他的科学理论就比其技术应用早了几十年。他在其博士论文“Recherches sur les lipides, les stérols et les protéides du sérum et du plasma sanguinis”中描述了马血浆脂蛋白，说明了在血浆中脂质与蛋白质的关系——依托于脂蛋白形式^[1]。现在人们已经认识到，脂质在血浆中以脂蛋白的方式进行转运，这些脂蛋白根据其分离出来的密度，分别被称为高密度、低密度、中密度和极低密度脂蛋白（HDL、LDL、IDL 和 VLDL）。乳糜微

粒来自于肠道，主要由饮食中的脂质和少量蛋白质构成。高密度脂蛋白（HDL）分为两类，即 HDL₂ 和 HDL₃。血浆脂蛋白水平作为冠心病（coronary heart disease, CHD）最重要的危险因素之一，可以通过简单的静脉穿刺和检测获取，并能为脂质紊乱的病因学和其最主要的病理后果——动脉粥样硬化提供线索。同时，也由此发现了许多可供分析的信息化内容。已经揭示的冠心病与各种脂质、脂蛋白的特性、成分和血浆浓度的关系及其机制，最终促进了临床诊断，为脂质代谢紊乱和动脉粥样硬化性疾病的药物干预提供了新的靶点。

脂蛋白的构成和特性

血浆脂蛋白由中性脂质、极性脂质和被称为载脂蛋白（apolipoproteins, apo）的特殊蛋白质所构