



Basic Science, Management, and Reconstruction
Browner · Jupiter · Levine · Trafton · Krettek

创伤骨科学

成人卷

(上卷) 第4版

FOURTH EDITION

SKELLETAL TRAUMA

主编 [美] 布鲁斯·D·布朗诺 杰西·B·朱庇特
艾伦·M·莱文 皮特·G·特拉夫顿
[德] 克里斯汀·科尔特克
主译 马信龙 冯世庆 李世民 周方

天津出版传媒集团

天津科技翻译出版有限公司

策划编辑: 刘 庆 袁 永
责任编辑: 姜晓婷 高慧茹 张 叶
美术编辑: 赵 冬

《创伤骨科学·成人卷》(第4版)是目前世界创伤骨科医学领域最具影响力的经典著作,由创伤骨科界权威布朗诺等117位北美和欧洲的世界顶级创伤骨科专家撰稿,多位国内骨科权威参与翻译。

本书主要传授创伤骨科临床实践经验,涵盖了与时代同步的几乎所有肌肉骨骼创伤的治疗方法和具体技术细节,具有很强的指导性和实用价值。全书共分4篇,65章,内容涉及脊柱、骨盆、上肢损伤和下肢损伤四个部分。此次修订在原有版本的基础上增加了一些重要内容,如介绍锁定钢板的使用,损伤控制骨科学概念,重大事故处理预案等。特别值得一提的是,本书收录了目前认可度较高的创伤治疗方法评估结果的相关重要材料。

本书的出版将是创伤骨科领域的又一经典力作。无论对于仍在学习的医学生还是已经工作的临床医生,本书都将成为指导他们治疗骨骼肌肉损伤的实用参考。



本书译自原版 SKELETAL
TRAUMA Basic Science, Mana-
gement, and Reconstruction, 4e,
并由 Elsevier 授权出版



上架建议: 骨科学

ISBN 978-7-5433-3299-7



9 787543 332997 >

定价: 660.00元(上·下卷)

第 4 版

上卷

创伤骨科学

Skeletal Trauma

Basic Science, Management, and Reconstruction

成人卷

布鲁斯·D·布朗诺

杰西·B·朱庇特

[美]

艾伦·M·莱文

主 编

皮特·G·特拉夫顿

[德] 克里斯汀·科尔特克

马信龙 冯世庆 李世民 周 方 主 译

娄思权 阚世廉 叶伟胜

孙景城 徐卫国 任秀智 副主译

魏学磊 刘 林 郭乾臣

天津出版传媒集团

天津科技翻译出版有限公司

著作权合同登记号:图字:02-2011-34

图书在版编目(CIP)数据

创伤骨科学. 成人卷/(美)布朗诺(Browner, B. D.)等主编;马信龙等译. —天津:天津科技翻译出版有限公司, 2015. 6

书名原文:Skeletal trauma: basic science, management, and reconstruction
ISBN 978-7-5433-3299-7

I. ①创… II. ①布… ②马… III. ①骨损伤-诊疗 IV. ①R683

中国版本图书馆CIP数据核字(2014)第275112号

Skeletal Trauma, 4/E

Bruce Browner, Jesse Jupiter, Alan Levine, Peter Trafton, Christian Krettek

ISBN-13: 978-1-4160-2220-6

ISBN-10: 1-4160-2220-1

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

Authorized Simplified Chinese translation from English language edition published by Elsevier Inc.

Copyright © 2015 by Elsevier(Singapore) Pte Ltd. All rights reserved.

Elsevier(Singapore) Pte Ltd.

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

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

First Published 2015, 2015年初版

Printed in China by Tianjin Science & Technology Translation & Publishing Co., Ltd. under special arrangement with Elsevier(Singapore) Pte Ltd. This edition is authorized for sale in China only, excluding Hong Kong SAR, Macau SAR and Taiwan. Unauthorized export of this edition is a violation of the Copyright Act. Violation of this Law is subject to Civil and Criminal Penalties.

本书简体中文版由天津科技翻译出版有限公司与 Elsevier(Singapore) Pte Ltd. 在中国境内(不包括香港及澳门特别行政区和台湾地区)合作出版。本版仅限在中国境内(不包括香港及澳门特别行政区和台湾地区)出版及标价销售。未经许可之出口, 视为违反著作权法, 将受到法律之制裁。

授权单位: Elsevier(Singapore) Pte Ltd.

出版: 天津科技翻译出版有限公司

出版人: 刘庆

地址: 天津市南开区白堤路244号

邮政编码: 300192

电话: (022) 87894896

传真: (022) 87895650

网址: www.tsttpc.com

印刷: 山东临沂新华印刷物流集团有限责任公司

发行: 全国新华书店

版本记录: 889×1194 16开本 177印张 4000千字 配图6200幅

2015年6月第1版 2015年6月第1次印刷

定价: 660.00元(上·下卷)

(如发现印装问题, 可与出版社调换)

译校者名单

主 译

马信龙 冯世庆 李世民 周 方

副主译

娄思权 阚世廉 叶伟胜 孙景城 徐卫国
任秀智 魏学磊 刘 林 郭乾臣

译校者(按姓氏汉语拼音排序)

蔡 迎	陈 有	邓书贞	董立平	冯洪永
冯世庆	宫可同	郭 琰	郭乾臣	阚世廉
李 洁	李桂石	李明新	李世民	李鑫鑫
刘 举	刘 林	刘兆杰	娄思权	吕 扬
马 英	马光辉	马剑雄	马信龙	苗普达
任秀智	孙 静	孙景城	万春友	王敬博
王晓南	王志彬	魏学磊	吴英华	夏 群
徐桂军	徐卫国	闫富宏	叶伟胜	于顺禄
袁 永	詹海华	张 波	张春虹	张建兵
张佐光	赵 飞	周 方	周恒星	

编者名单

Joseph A. Abate, III, M.D.

Associate Professor, University of Vermont,
Department of Orthopaedics and Rehabilitation,
Burlington, Vermont

Dislocations and Soft Tissue Injuries of the Knee

Albert J. Aboulaflia, M.D.

Assistant Clinical Professor, Department of
Orthopaedic Surgery, University of Maryland School
of Medicine; Co-Director, Sarcoma Service, Alvin
and Lois Lapidus Cancer Center, Sinai Hospital,
Baltimore, Maryland

Pathologic Fractures

Annunziato Amendola, M.D., F.R.C.S.(C.)

Associate Professor, University of Western Ontario,
London, Ontario, Canada

Compartment Syndromes

Caesar A. Anderson, M.D., M.P.H.

Fellow, Yale-New Haven Hospital,
New Haven, Connecticut

*Substance Abuse Syndromes: Recognition, Prevention,
and Treatment*

Paul A. Anderson, M.D.

Professor, Department of Orthopedic Surgery and
Rehabilitation, University Hospital,
Madison, Wisconsin

Injuries of Lower Cervical Spine

Michael T. Archdeacon, M.D.

Vice-Chairman and Associate Professor,
Department of Orthopaedic Surgery,
University of Cincinnati; Director, Division of
Musculoskeletal Traumatology,
University Hospital,
Cincinnati, Ohio

Patella Fractures and Extensor Mechanism Injuries

Terry S. Axelrod, M.D.

Associate Professor of Surgery, University of Toronto
Faculty of Medicine; Head, Division of Orthopaedic
Surgery, Sunnybrook and Women's College Health
Sciences Centre, Toronto, Ontario, Canada

Fractures and Dislocations of the Hand

Rahul Banerjee, M.D.

Assistant Professor, Texas Tech University Health
Sciences Center; Chief of Orthopaedic Trauma,
William Beaumont Army Medical Center, El Paso, Texas

Foot Injuries

Craig S. Bartlett, III, M.D.

Assistant Clinical Professor, Orthopaedic Trauma
Service, Department of Orthopaedics, University of
Vermont College of Medicine, Burlington, Vermont

Fractures of the Tibial Pilon

Rebecca M. Bauer, M.D., M.P.H.

Research Coordinator, Division of Orthopedic Trauma,
Vanderbilt Orthopedic Institute, Nashville, Tennessee

Outcomes Research in Orthopaedics

Michael R. Baumgaertner, M.D.

Professor, Department of Orthopaedics and
Rehabilitation, Yale University School of Medicine;
Chief, Orthopaedic Trauma Service, Yale-New Haven
Hospital, New Haven, Connecticut

*Medical Management of the Patient with Hip Fracture;
Intertrochanteric Hip Fractures*

Fred F. Behrens, M.D.*

Fractures with Soft Tissue Injuries

Mark R. Belsky, M.D.

Associate Clinical Professor of Orthopaedic Surgery,
Tufts University School of Medicine, Boston; Chief of
Orthopaedic Surgery, Newton-Wellesley Hospital,
Newton, Massachusetts

Fractures and Dislocations of the Hand

Daniel R. Benson, M.D.

Professor, Department of Orthopaedics, University of
California, Davis, School of Medicine; Orthopaedic
Surgeon, University of California, Davis, Medical
Center, Sacramento, California

*Initial Evaluation and Emergency Treatment of the
Spine-Injured Patient*

Daniel J. Berry, M.D.

Professor of Orthopaedic Surgery, Mayo Clinic College
of Medicine; Consultant, Department of Orthopaedics,
Mayo Clinic, Rochester, Minnesota

Periprosthetic Fractures of the Lower Extremity

*Deceased.

Mohit Bhandari, M.D., M.Sc., F.R.C.S.C

Clinical Research Fellow, St. Michael's Hospital,
Toronto, Ontario, Canada
Fractures of the Humeral Shaft

**Christopher T. Born, M.D., F.A.A.O.S.,
F.A.C.S**

Professor, Department of Orthopaedic Surgery, The
Alpert Medical School, Brown University; Director,
Orthopaedic Trauma Service, Rhode Island Hospital,
Providence, Rhode Island
Disaster Management

Michael J. Bosse, M.D.

Orthopaedic Trauma Surgeon, Department of
Orthopaedic Surgery, Carolinas Medical Service,
Charlotte, North Carolina
*Damage Control Orthopaedic Surgery: A Strategy for the
Orthopaedic Care of the Critically Injured Patient*

Robert T. Brautigam, M.D., F.A.C.S.

Associate Professor of Surgery, School of Medicine,
University of Connecticut, Farmington, Connecticut;
Director of the Surgical Program, American College of
Surgeons Comprehensive Education Institute;
Associate Director, Neuroscience, Neurosurgery/
Trauma Intensive Care Unit; Associate Director,
Surgical Intensive Care Unit, Department of Surgery,
Hartford Hospital, Hartford, Connecticut
*Evaluation and Treatment of the Multiple-Trauma
Patient*

Mark R. Brinker, M.D.

Clinical Professor of Orthopaedic Surgery, Tulane
University School of Medicine, New Orleans,
Louisiana; Clinical Professor of Orthopaedic Surgery,
Baylor College of Medicine; Director of Acute and
Reconstructive Trauma, Fondren Orthopedic Group,
Texas Orthopedic Hospital, Houston, Texas
Nonunions: Evaluation and Treatment

Bruce D. Browner, M.D., M.S., F.A.C.S.

Gray-Gossling Chair,
Professor and Chairman Emeritus,
Department of Orthopaedic Surgery,
University of Connecticut Health Center;
Director, Department of Orthopaedics,
Hartford Hospital, Hartford, Connecticut
*Principles of Internal Fixation; Surgical Site Infection
Prevention; Chronic Osteomyelitis*

Ryan P. Calfee, M.D.

Fellow of Orthopaedic Trauma, Department of
Orthopaedic Surgery, Brown University School of
Medicine; Fellow of Orthopaedic Trauma, Department
of Orthopaedic Surgery, Rhode Island Hospital,
Providence, Rhode Island
Disaster Management

Jason H. Calhoun, M.D.

Department of Orthopaedics and Rehabilitation,
University of Texas Medical Branch, Galveston, Texas
Surgical Site Infection Prevention

Andrew E. Caputo, M.D.

Clinical Assistant Professor, Department of
Orthopaedic Surgery, University of Connecticut Health
Sciences Center, Farmington; Co-Director, Hand
Surgery Service, Hartford Hospital and Connecticut
Children's Medical Center, Hartford, Connecticut
Principles of Internal Fixation

James B. Carr, M.D.

Associate Clinical Professor, Department of
Orthopaedic Surgery, University of South Carolina,
Columbia, South Carolina; Attending Orthopedic
Surgeon, Lewis Gale Medical Center,
Salem, Virginia
Malleolar Fractures and Soft-Tissue Injuries of the Ankle

Charles Cassidy, M.D.

Chairman, Department of Orthopaedics, Henry H.
Banks Associate Professor of Orthopaedic Surgery,
Tufts-New England Medical Center, Boston,
Massachusetts
Fractures and Dislocations of the Carpus

Mark S. Cohen, M.D.

Professor, Director, Hand and Elbow Section,
Director, Orthopaedic Education, Department of
Orthopaedic Surgery, Rush University Medical Center,
Chicago, Illinois
Fractures of the Distal Radius

Peter A. Cole, M.D.

Associate Professor, Department of Orthopaedic
Surgery, University of Minnesota, Minneapolis,
Minnesota; Chief, Department of Orthopaedic
Surgery, Regions Hospital, Saint Paul, Minnesota
Tibial Plateau Fractures

**Christopher L. Colton, M.D., F.R.C.S.,
F.R.C.S.Ed.**

Senior Consultant in Orthopaedic Trauma,
Nottingham University Hospital, Nottingham,
England
The History of Fracture Treatment

Leo M. Cooney, Jr., M.D.

Humana Foundation Professor of Geriatric Medicine,
Professor and Chief, Section of Geriatrics,
Yale University School of Medicine, New Haven,
Connecticut
Medical Management of the Patient with Hip Fracture

Brian W. Cooper, M.D., F.A.C.P.

Director, Division of Infectious Disease, Allergy, and Immunology, Hartford Hospital; Professor of Clinical Medicine, University of Connecticut School of Medicine, Farmington, Connecticut
Avoidance of Occupationally Acquired Blood-Borne Pathogens

Charles N. Cornell, M.D.

Associate Professor, Orthopaedic Surgery, Cornell University Joan and Sanford I. Weill Medical College and Graduate School of Medical Sciences, New York; Chairman, Department of Orthopaedic Surgery, New York Hospital Medical Center of Queens and Flushing Hospital Medical Center, Flushing, New York
Osteoporotic Fragility Fractures

Jerome M. Cotler, M.D.

Professor of Orthopaedic Surgery, Thomas Jefferson University Hospital, Philadelphia, Pennsylvania
Fractures in the Stiff and Osteoporotic Spine

Bradford L. Currier, M.D.

Mayo Clinic Department of Orthopaedic Surgery, Rochester, Minnesota
Complications in the Treatment of Spinal Trauma

Joseph P. DeAngelis, M.D.

Department of Orthopaedic Surgery, University of Connecticut School of Medicine, Farmington, Connecticut
Principles of Internal Fixation

Christopher W. DiGiovanni, M.D.

Assistant Professor, Department of Orthopaedic Surgery, Brown University School of Medicine; Director, Foot and Ankle Service, Rhode Island Hospital, Providence, Rhode Island
Foot Injuries

Mark E. Easley, M.D.

Assistant Professor, Division of Orthopaedic Surgery, Duke University Medical Center, Durham, North Carolina
Foot Injuries

Robert K. Eastlack, M.D.

Clinical Instructor, Department of Orthopaedic Surgery, University of California—San Diego; Orthopaedic Spine Surgeon, Orthopaedic Medical Group, Sharp Memorial Hospital, San Diego, California
Complications in the Treatment of Spinal Trauma

Thomas A. Einhorn, M.D.

Professor of Orthopaedic Surgery and Biomedical Engineering, Chairman, Department of Orthopaedic Surgery, Boston University School of Medicine, Boston, Massachusetts
Biology and Enhancement of Skeletal Repair

Frank Eismont, M.D.

Professor and Vice-Chairman, Department of Orthopaedic Surgery, University of Miami School of Medicine; Co-Director, Acute Spinal Cord Injury Unit, Jackson Memorial Hospital, Miami, Florida
Thoracic and Upper Lumbar Spine Injuries; Gunshot Wounds of the Spine

Nathan K. Endres, M.D.

Assistant Professor, Department of Orthopaedics and Rehabilitation, University of Vermont; Orthopaedic Surgeon, Fletcher Allen Health Care, Burlington, Vermont
Fractures of the Tibial Pilon

David V. Feliciano, M.D.

Professor of Surgery, Emory University School of Medicine; Chief of Surgery, Chief of Vascular Surgery, Grady Memorial Hospital, Atlanta, Georgia
Evaluation and Treatment of Vascular Injuries

Theodore Fischer, M.D., M.S.

Orthopaedic Spine Surgeon, Illinois Bone and Joint Institute, Chicago, Illinois
Spinal Orthoses

John C. France, M.D.

Professor, Orthopaedics, West Virginia University, Morgantown, West Virginia
Injuries of the Cervicocranium

Robert Frigg

Chief Technology Officer, Synthes GmbH, Bettlach Solothurn, Switzerland
Locking Plates: Development, Biomechanics, and Clinical Application

Richard H. Gannon, Pharm.D.

Adjunct Clinical Professor, School of Pharmacy, University of Connecticut, Storrs, Connecticut; Clinical Specialist, Pain Management, Department of Pharmacy Services, Hartford Hospital, Hartford, Connecticut
Pharmacologic Management of the Orthopaedic Trauma Patient

Steven R. Garfin, M.D.

Professor and Chair, Department of Orthopaedics, University of California, San Diego, San Diego, California
Thoracic and Upper Lumbar Spine Injuries

Peter V. Giannoudis, M.D.

Professor of Trauma and Orthopaedics, The University of Leeds, The General Infirmary at Leeds, Leeds, West Yorkshire, United Kingdom
Femoral Shaft Fractures

Gregory E. Gleis, M.D.

Associate Clinical Professor, Department of Orthopaedic Surgery, University of Louisville School of Medicine, Louisville, Kentucky
Diagnosis and Treatment of Complications

Ryan T. Gocke, M.D.

Department of Orthopaedics, West Virginia University, Morgantown, West Virginia
Injuries of the Cervicocranium

James A. Goulet, M.D.

Professor, Department of Orthopaedic Surgery, University of Michigan Medical School; Director, Orthopaedic Trauma Service, University of Michigan Hospital, Ann Arbor, Michigan
Hip Dislocations

Andrew Green, M.D.

Associate Professor, Department of Orthopaedic Surgery, Brown Medical School; Chief of Shoulder and Elbow Surgery, Orthopaedic Surgery, Rhode Island Hospital, Providence, Rhode Island
Proximal Humerus Fractures and Glenohumeral Dislocations

Stuart A. Green, M.D.

Clinical Professor, Orthopaedic Surgery, University of California, Irvine, School of Medicine, Irvine, California
Principles and Complications of External Fixation

Neil Grey, M.D.

Department of Endocrinology, Hartford Hospital, Hartford, Connecticut
Surgical Site Infection Prevention

Munish C. Gupta, M.D.

Associate Professor, Department of Orthopaedics, University of California, Davis, School of Medicine; Orthopaedic Surgeon, University of California, Davis, Medical Center, Sacramento, California
Initial Evaluation and Emergency Treatment of the Spine-Injured Patient

George J. Haidukewych, M.D.

Division of Adult Reconstruction and Orthopedic Trauma, Florida Orthopedic Institute and Tampa General Hospital, Temple Terrace, Florida
Post-Traumatic Reconstruction of the Hip Joint

Sigvard T. Hansen, Jr., M.D.

Professor and Chairman Emeritus, Department of Orthopaedic Surgery, University of Washington School of Medicine; Director, Foot and Ankle Institute, Harborview Medical Center, Seattle, Washington
Post-Traumatic Reconstruction of the Foot and Ankle

Wilson C. Hayes, Ph.D.

Professor, Nutrition and Exercise Science, College of Health and Human Science, Oregon State University; Adjunct Professor, Mechanical Engineering, College of Engineering, Oregon State University, Corvallis, Oregon
Biomechanics of Fractures

John A. Hipp, Ph.D.

Department of Orthopedic Surgery, Baylor College of Medicine, Houston, Texas
Biomechanics of Fractures

Lenworth M. Jacobs, M.D., M.P.H., F.A.C.S.

Professor of Surgery, University of Connecticut School of Medicine, Farmington; Director, Traumatology, Hartford Hospital, Hartford, Connecticut
Evaluation and Treatment of the Multiple-Trauma Patient

Jesse B. Jupiter, M.D.

Director, Orthopaedic Hand Service, Massachusetts General Hospital; Hansjörg Wyss/AO Professor, Harvard Medical School, Boston, Massachusetts
Fractures and Dislocations of the Hand; Fractures of the Distal Radius; Diaphyseal Fractures of the Forearm; Trauma to the Adult Elbow and Fractures of the Distal Humerus; Injuries to the Shoulder Girdle

Sanjeev Kakar, M.D., M.R.C.S.

Orthopaedic Research Associate, Department of Orthopaedic Surgery, Boston University School of Medicine; Orthopaedic Surgery Resident, Orthopaedic Surgery, Boston Medical Center, Boston, Massachusetts
Biology and Enhancement of Skeletal Repair

Steven P. Kalandiak, M.D.

Assistant Professor of Clinical Orthopaedics Surgery of the Shoulder and Elbow, Department of Orthopaedics and Rehabilitation, Miller School of Medicine, University of Miami, Miami, Florida
Gunshot Wounds to the Musculoskeletal System

Timothy L. Keenen, M.D.

Clinical Associate Professor of Orthopaedic Surgery, Oregon Health Sciences University School of Medicine, Portland, Oregon
Initial Evaluation and Emergency Treatment of the Spine-Injured Patient

James F. Kellam, M.D., F.R.C.S.(C.), F.A.C.S., F.R.C.S.(I.)

Director, Orthopaedic Trauma Program and Fellowships, Vice Chairman, Department of Orthopaedic Surgery, Carolinas Medical Center, Charlotte, North Carolina

Damage Control Orthopaedic Surgery: A Strategy for the Orthopaedic Care of the Critically Injured Patient; Pelvic Ring Disruptions; Diaphyseal Fractures of the Forearm

Gino M.M.J. Kerkhoffs, M.D., Ph.D.

Orthopedic Surgeon, University of Amsterdam; Orthopedic Surgeon, Department of Orthopaedic Surgery, Academic Medical Center, Amsterdam, The Netherlands

Malunions and Nonunions About the Knee

Choll W. Kim, M.D., Ph.D.

Assistant Professor, Orthopaedic Surgery, University of California-San Diego, San Diego, California

Complications in the Treatment of Spinal Trauma

Ioannis P. Kioumis

Center for Anti-Infective Research and Development, Aristotle University of Thessaloniki, Medical Faculty, Thessaloniki, Greece

Antibiotic Therapy: General Considerations

Christian Krettek, M.D.

Director, Trauma Department, Hannover Medical School, Hannover, Germany

Fractures of the Distal Femur

Joseph L. Kuti, Pharm. D.

Associate Director, Clinical and Economic Studies Center for Anti-Infective Research and Development, Hartford Hospital, Hartford, Connecticut

Antibiotic Therapy: General Considerations

Brian K. Kwon, M.D., Ph.D., F.R.C.S.(C.)

Combined Neurosurgical and Orthopaedic Spine Program, Department of Orthopaedics, University of British Columbia, Vancouver, British Columbia, Canada

Injuries of Lower Cervical Spine

Joseph M. Lane, M.D.

Professor of Orthopaedic Surgery, Assistant Dean, Weill College of Medicine of Cornell University; Chief, Metabolic Bone Disease Service, Attending, Orthopaedic Trauma Service, Hospital for Special Surgery, New York, New York

Osteoporotic Fragility Fractures

Yu-Po Lee, M.D.

Assistant Clinical Professor, Orthopedic Surgery, University of California-San Diego, San Diego, California

Thoracic and Upper Lumbar Spine Injuries

Alan M. Levine, M.D.

Director, Alvin and Lois Lapidus Cancer Institute, Sinai Hospital, Baltimore, Maryland

Pathologic Fractures; Spinal Orthoses; Low Lumbar Fractures; Fractures of the Sacrum

Bruce A. Levy, M.D.

Assistant Professor, Department of Orthopaedic Surgery, University of Minnesota, Minneapolis, Minnesota; Vice Chief of Orthopaedic Surgery, Regions Hospital, St. Paul, Minnesota

Tibial Plateau Fractures

Frank A. Liporace, M.D.

Assistant Professor, Department of Orthopaedics—Trauma Division, New Jersey Medical School; Assistant Professor, Department of Orthopaedics—Trauma Division, University of Medicine and Dentistry of New Jersey, Newark, New Jersey

Fractures with Soft Tissue Injuries

Susan MacArthur, R.N., C.I.C., M.P.H.

Infection Control Practitioner, Clinical Quality Management Specialist, Hartford Hospital, Hartford, Connecticut

Avoidance of Occupationally Acquired Blood-Borne Pathogens; Surgical Site Infection Prevention

Luke Madigan, M.D.

Attending Spine Surgeon, Knoxville Orthopaedic Clinic, Knoxville, Tennessee

Fractures in the Stiff and Osteoporotic Spine

René K. Marti, M.D.

Department of Orthopaedic Surgery, Academic Medical Center, Amsterdam, The Netherlands

Malunions and Nonunions About the Knee

Peter J. Mas, M.S., D.A.B.M.P.

Medical Health Physicist and Radiation Safety Officer, Hartford Hospital, Hartford, Connecticut

Optimal and Safe Use of C-Arm X-Ray Fluoroscopy Units

Jeffrey W. Mast, M.D.

Northern Nevada Medical Center, Sparks, Nevada

Principles of Internal Fractures

Keith A. Mayo, M.D.

Orthopaedic Center, Tacoma, Washington

Pelvic Ring Disruption

Augustus D. Mazzocca, M.D.

Assistant Professor, Department of Orthopaedic Surgery, University of Connecticut Health Sciences Center, Farmington, Connecticut

Principles of Internal Fixation

Michael D. McKee, M.D.

Associate Professor, Division of Orthopaedics,
Department of Surgery, University of Toronto;
Staff Surgeon, Division of Orthopaedic Surgery,
St. Michaels Hospital, Toronto, Canada
Trauma to the Adult Elbow and Fractures of the Distal Humerus

Michael W. Mendes, M.D.

Attending Physician, McLeod Regional Medical
Center, Florence, South Carolina
Principles of Internal Fixation

Stuart E. Mirvis, M.D., F.A.C.R.

Professor, Department of Radiology, University of
Maryland School of Medicine; Director, Trauma and
Emergency Radiology, Diagnostic Radiology,
University of Maryland Medical Center, Baltimore,
Maryland
Spinal Imaging

Victor A. Morris, M.D.

Assistant Professor of Medicine, General Medicine;
Director, Hospital Service; Director, Medicine Consult
Service; Director, Medicine Consult Service,
Yale University School of Medicine, New Haven,
Connecticut
Medical Management of the Patient with Hip Fracture

Amir Mostofi, M.D.

Resident, University of Connecticut, Farmington,
Connecticut
Surgical Site Infection Prevention

David P. Nicolau, Pharm.D., F.C.C.P.

Center for Anti-Infective Research and Development,
Hartford Hospital, Hartford, Connecticut
Antibiotic Therapy: General Considerations

Florian Nickisch, M.D.

Assistant Professor of Orthopaedic Surgery,
Department of Orthopaedics, University of Utah,
Salt Lake City, Utah
Foot Injuries

Sean E. Nork, M.D.

Associate Professor, Orthopaedics and Sports
Medicine, University of Washington; Associate
Professor, Orthopaedics and Sports Medicine,
Veterans' Hospital, Seattle, Washington
Subtrochanteric Fractures of the Femur

Tom R. Norris, M.D.

Orthopaedic Surgery, California Pacific Medical
Center, San Francisco, California
Proximal Humerus Fractures and Glenohumeral Dislocations

William T. Obrebsky, M.D., M.P.H.

Associate Professor, Department of Orthopaedics and
Rehabilitation, Division of Orthopaedic Trauma,
Vanderbilt University Medical Center, Nashville,
Tennessee
Outcomes Research in Orthopaedics

Daniel P. O'Connor, Ph.D.

Assistant Professor, University of Houston,
Houston, Texas
Nonunions: Evaluation and Treatment

Matthew E. Oetgen, M.D.

Resident, Orthopaedic Surgery, Yale-New Haven
Hospital, New Haven, Connecticut
Intertrochanteric Hip Fractures

Patrick W. Owens, M.D.

Assistant Professor of Clinical Orthopaedics,
Department of Orthopaedics, Miller School of
Medicine, University of Miami, Miami, Florida
Gunshot Wounds to the Musculoskeletal System

Dror Paley, M.D., F.R.C.S.C.

Director, Rubin Institute for Advanced Orthopaedics,
Co-Director, International Center for Limb-
Lengthening, Sinai Hospital of Baltimore, Baltimore,
Maryland
Principles of Deformity Correction

George A. Perdrizet, M.D., Ph.D., F.A.C.S.

University of Connecticut; Staff Surgeon, Hartford
Hospital, Hartford, Connecticut
Substance Abuse Syndromes: Recognition, Prevention, and Treatment

Ed Pesanti, M.D., F.A.C.P.

Professor, Department of Medicine, University of
Connecticut School of Medicine; University
of Connecticut Health Center, Farmington,
Connecticut
Chronic Osteomyelitis

Michael S. Pinzur, M.D.

Professor, Department of Orthopaedic Surgery and
Rehabilitation, Loyola University Medical Center,
Maywood, Illinois
Amputations in Trauma

Ryan M. Putnam, M.D.

Clinical Instructor, Orthopaedic Surgery and
Rehabilitation, University of Vermont; Clinical
Instructor, Orthopaedic Surgery and Rehabilitation,
Fletcher Allen Health Care, Burlington, Vermont
Fractures of the Tibial Pilon

Mark C. Reilly, M.D.

Department of Orthopaedic Surgery, Newark, New Jersey
Subtrochanteric Fractures of the Femur

David Ring, M.D., Ph.D.

Assistant Professor, Orthopaedic Surgery, Harvard Medical School; Medical Director and Director of Research, Orthopaedic Hand and Upper Extremity Service, Massachusetts General Hospital, Boston, Massachusetts

Injuries to the Shoulder Girdle

Craig S. Roberts, M.D.

Professor, Residency Program Director, University of Louisville School of Medicine, Louisville, Kentucky
Diagnosis and Treatment of Complications

Kenneth J. Robinson, M.D., F.A.C.E.P.

Associate Professor of Emergency Medicine, University of Connecticut School of Medicine, Farmington, Connecticut; Medical Director, Program Director, LIFE STAR Helicopter Program; Chief, Prehospital Services, Department of Emergency Medical Services/Trauma, Hartford Hospital, Hartford, Connecticut

Evaluation and Treatment of the Multiple-Trauma Patient

Craig M. Rodner, M.D.

Assistant Professor, University of Connecticut Department of Orthopaedics, Farmington, Connecticut
Chronic Osteomyelitis

Jonathan G. Roper, M.D.

Department of Orthopaedic Surgery, Kaiser Permanente Medical Center, San Diego, California
Gunshot Wounds of the Spine

Milton Lee (Chip) Routt, Jr., M.D.

Professor, Orthopaedics and Sports Medicine, University of Washington; Professor, Orthopaedics and Sports Medicine, Harborview Medical Center, Seattle, Washington
Surgical Treatment of Acetabular Fractures

Leonard K. Ruby, M.D.

Professor of Orthopaedic Surgery, Tufts University School of Medicine; Senior Staff, Hand Surgery, Department of Orthopaedic Surgery, New England Medical Center, Boston, Massachusetts
Fractures and Dislocations of the Carpus

Roy W. Sanders, M.D.

Clinical Professor of Orthopaedics, University of South Florida College of Medicine, Tampa, Florida
Patella Fractures and Extensor Mechanism Injuries

Richard A. Saunders, M.D.

Orthopedic Surgeon, The Glens Falls Hospital, Glens Falls, New York
Physical Impairment Ratings for Fractures

Joseph Schatzker, M.D.

Professor, University of Toronto Faculty of Medicine; Orthopaedic Surgeon, Sunnybrook Health Science Center, Toronto, Ontario, Canada
Tibial Plateau Fractures

Emil H. Schemitsch, M.D., F.R.C.S.C.

Professor and Head, Division of Orthopaedic Surgery, St. Michael's Hospital, Toronto, Ontario, Canada
Fractures of the Humeral Shaft

David Seligson, M.D.

Department of Orthopaedic Surgery, University of Louisville, Louisville, Kentucky
Diagnosis and Treatment of Complications

Richard Sheppard, M.D.

Sub-specialty Chair, Orthopaedics and Anesthesia, Hartford Anesthesiology Associates, Hartford, Connecticut
Evaluation and Treatment of the Multiple-Trauma Patient

Randy Sherman, M.D.

Professor of Surgery, Orthopedics, and Neurologic Surgery, Chief, Division of Plastic Surgery, Keck School of Medicine, University of Southern California; Chair, Department of Surgery, Associate Medical Director, Surgical Services, Los Angeles County and U.S.C. Medical Center, Los Angeles, California
Soft Tissue Coverage

Michael S. Sirkin, M.D.

Associate Professor, University of Medicine and Dentistry of New Jersey Medical School; Chief, Orthopaedic Trauma Service, University Hospital, Newark, New Jersey
Fractures with Soft Tissue Injuries

Raymond Malcolm Smith, M.D., F.R.C.S.

Chief, Orthopaedic Trauma Service, Massachusetts General Hospital; Associate Professor in Orthopaedics, Harvard Medical School, Boston, Massachusetts
Femoral Shaft Fractures

Michael D. Stover, M.D.

Director, Division of Orthopaedic Surgery, Loyola University Medical Center, Maywood, Illinois
Pelvic Ring Disruption

Marc F. Swiontkowski, M.D.

Professor and Chair, University of Minnesota,
Department of Orthopaedic Surgery, Minneapolis,
Minnesota
*Outcomes Research in Orthopaedics; Intracapsular Hip
Fractures*

Max Talbot, M.D., F.R.C.S.

1 Canadian Field Hospital, Canadian Forces
Fractures of the Humeral Shaft

Cary Templin, M.D.

Staff Surgeon, Hinsdale Orthopaedic Associates,
Hinsdale, Illinois
Thoracic and Upper Lumbar Spine Injuries

Peter G. Trafton, M.D.

Professor of Orthopaedics, The Warren Alpert Medical
School of Brown University; Former Surgeon-in-
charge, Orthopaedic Trauma, Rhode Island Hospital,
Providence, Rhode Island
Tibial Shaft Fractures

Bruce C. Twaddle, M.D., F.R.A.C.S.

Director of Orthopaedic Trauma, Auckland Hospital,
Auckland, New Zealand
Compartment Syndromes

Elizabeth E. C. Udeh, Pharm.D., B.C.P.S.

Assistant Clinical Professor, University of Connecticut
School of Pharmacy, Storrs, Connecticut; Clinical
Pharmacy Coordinator, Department of Pharmacy,
Hartford Hospital, Hartford, Connecticut
Anticoagulation

Michael A. Wagner, M.D.

Professor and Director, Division of Trauma Surgery
and Sports Medicine, Wilhelmin Hospital, Vienna,
Austria
*Locking Plates: Development, Biomechanics, and Clinical
Application*

J. Tracy Watson, M.D.

Professor of Orthopaedic Surgery, Wayne State
University School of Medicine; Vice Chief of
Orthopaedics, Division of Orthopaedic Traumatology,
Detroit Receiving Hospital, Detroit Medical Center,
Detroit, Michigan
Tibial Plateau Fractures

Brent B. Wiesel, M.D.

Instructor, Orthopaedic Surgery, University of
Pennsylvania, Philadelphia, Pennsylvania
Physical Impairment Ratings for Fractures

Sam W. Wiesel, M.D.

Professor and Chair, Department of Orthopaedics,
Georgetown University Medical Center,
Washington, D.C.
Physical Impairment Ratings for Fractures

Susan L. Williams, M.D.

Orthopaedic and Spine Surgery, Roseburg, Oregon
Spinal Orthoses

Luther H. Wolff, III, M.D.

Mayo Clinic, Rochester, Minnesota
Periprosthetic Fractures of the Lower Extremity

Michael J. Yaszemski, M.D., Ph.D.

Professor, Departments of Orthopedic Surgery and
Biomedical Engineering, Mayo Clinic College of
Medicine; Consultant, Orthopedic Spine Surgery,
Department of Orthopaedic Surgery, Mayo Clinic,
Rochester, Minnesota
Complications in the Treatment of Spinal Trauma

Gregory A. Zych, D.O.

Christine E. Lynn Distinguished Chair in
Orthopaedic Trauma, Associate Chairman for
Clinical Affairs, Department of Orthopaedics and
Rehabilitation, Miller School of Medicine at the
University of Miami; Chief, Orthopaedic Trauma,
Ryder Trauma Center, Jackson Memorial Hospital,
Miami, Florida
Gunshot Wounds to the Musculoskeletal System

中文版序——原作者致辞

自《创伤骨科学》第1版于1992年面市以来,本书诸位编委、作者和出版者一直致力于为罹患骨折、脱位和其他肌肉骨骼系统损伤的患者提供诊断、决策、治疗和康复的实用指南。每出版一次新版本都会增加一些新素材和新作者,以便体现骨科领域的新进展并回应读者反馈的信息。为了紧跟互联网和电子出版物的发展,我们正通过电子媒体稳步地扩展着获取本书的渠道。悉闻本书已然成为全球认可的标准参考书并指导了众多伤者的康复治疗,我们深感欣慰。

中国人口众多,中国骨科医师面临着治疗骨科创伤的各种挑战,因此,Elsevier 同意出版本书第4版的中文版,我倍感欣喜和荣幸。我相信,中文版本会使中国正接受培训和临床一线的骨科医师获取相关重要信息更加便捷,并有助于他们为日益增多的骨创伤患者提供专业化治疗。除了道路交通事故损伤以外,人口老龄化和骨质疏松性脆性骨折病例数的扩大,目前已成为中国医疗的重大负担。本版还包括有困扰中国骨科医生的股骨近端和其他部位骨折的相关内容。

在中国,工业化和城市化使道路上的机动车数量激增,随之而来的是道路交通事故死伤人员数量的剧增。在2009年,全国发生交通事故238 351起,造成65 758人死亡,275 125人受伤,直接经济损失高达9.1亿元。人均交通事故死亡率高于其他发达国家。现已发现有多种因素造成了这一日益严重的问题。行人和骑自行车的人横穿马路,越出非机动车道;而司机通常又不停车避让,往往就会撞上他们。在上下班高峰期行车情况会变得更糟。由于安全带使用率低,司机受伤会更严重,此外在车满为患的道路上摩托车、轻型摩托车和电动车的数量也在与日俱增,也会使没有安全保护的人员受到伤害。

缺乏统一且广泛适用的院前护理以及训练有素的急症和创伤救护人员的不足,也会增加交通事故中受伤者的死亡和残疾风险。2003年,中国政府把道路交通事故认定为危害公众健康的主要问题,建立了道路安全部长协调系统,并制定了一系列新的道路安全法律法规。在过去的5年中,姜保国教授一直代表政府在北京从事标准化院前创伤救护的开发工作,是这一工程的重要创始人。《创伤骨科学》(第4版)中文版付梓在即,我诚邀他为之作序,他欣然应允,并详细介绍了这项工作。我希望《创伤骨科学》能同他一道帮助中国内外科医生为道路交通事故受害者提供最好的救护。

我相信在我们国家骨科手术医师有很多机会通过学习并与其他医生合作提高处理肌肉骨骼系统疾病的水平,为民众解除痛苦。最好能与各家救护中心面对面的互动和互访,但是由于时间和资金有限,难以满足患者和家庭成员对护理的不同需求,因而促使我们更多地利用互联网来进行讨论。好在现代技术能让我们高清晰度地进行多地互动。

中美两国作为主要的经济实体和尖端的医疗团体，完全应该携起手来共同协助发展中国的同事应对预防和救护道路交通事故、战争和自然灾害造成的骨骼创伤所面临的巨大挑战。

能够与姜教授携手共建我们两个专业团体深化合作的桥梁，我感到万分荣幸。最后，我对所有参与本书翻译的业界同仁表示衷心的感谢。

Bruce D. Browner, MD, MHCM, FACS

中文版序——原作者致辞

Since publication of the first edition in 1992, the editors, authors and publisher of *Skeletal Trauma* have strived to make the text a practical resource to guide diagnosis, decision-making, treatment and rehabilitation of patients with fractures, dislocations and other injuries to the musculoskeletal system. New material and new authors have been added as each new edition was published to incorporate advances in the field and respond to input from readers. In keeping with the evolution of the Internet and electronic publishing, we have steadily expanded the access to the content via electronic media. We have been gratified by the worldwide adoption of the text as a standard reference and the knowledge that it has guided the care of so many injured people.

Given the immense population of China and the many challenges facing its orthopaedic surgeons who treat skeletal injuries, I am pleased and honored that Elsevier China has agreed to create a Chinese translation of the fourth Edition. The translation will make vital information more accessible to the orthopaedic surgeons in training and practice and aid their efforts to provide expert care for a growing number of skeletal injuries. In addition to road traffic injuries, the aging of the population and expanding number of osteoporotic fragility fractures are now a major portion of the country's medical burden. The text also covers fractures of the proximal femur and other parts of the skeleton that challenge Chinese surgeons.

Growing industrialization and urbanization has led to a burgeoning number of vehicles on the roads in China that has been associated with a tremendous increase in road traffic deaths and disabling injuries. In 2009, there were 238,351 traffic crashes leading to 65,758 deaths and 275,125 injuries with a direct economic cost of 0.91 billion Chinese Yuan. The rate of traffic related fatality per population is higher than in other highly developed countries.

A number of factors have been noted to explain the growing problem. Pedestrians and cyclists cross roads and don't remain in designated lanes. Drivers hit them frequently, because they often will not stop for them. The situation is even worse during rush hour when driving is more aggressive. Drivers are sustaining more injuries, because seat belt use is low. In addition growing number of motorcycles, scooters, and e-bikes are on the roads with heavier vehicles, leading to injuries of less protected riders.

The lack of uniform widely available prehospital care and trained emergency and trauma providers contributed to the deaths and disabilities of those injured in crashes. In 2003 the Chinese Government recognized road traffic injuries as a major public health

problem, established The Ministerial Coordination System on Road Safety and implemented a number of new road safety laws. For the past five years, Professor Baoguo Jiang has lead an important initiative on behalf of the government to develop standardized prehospital and trauma care in Beijing. I am honored that he has agreed to write the forward for the Chinese translation of the Fourth Edition and has described his wonderful program in some detail. I hope that Skeletal Trauma can be an adjunct to his efforts that will assist the Chinese physicians and surgeons in delivering optimal care for their citizens who are injured in road traffic crashes.

I believe there are many opportunities for orthopaedic surgeons in our countries to learn from and work with each other to improve the care of injuries and other musculoskeletal problems that face our populations. Although there is no substitute for face-to-face interaction and reciprocal visits to centers of practice, the respective demands of patient care and families resulting in limited time and funds for travel should move us to greater use of Internet based conferencing. Technology is now available to enable live interactive multisite programs with high definition quality.

As leading economic powers and sophisticated medical communities we should work together to assist our colleagues in the developing world to meet their enormous challenges for prevention and care of skeletal injuries from road traffic crashes, war and natural disasters.

It would be a privilege and honor to work with Professor Jiang to build bridges between our professional communities to foster collaboration. Finally, I would like to acknowledge the colleagues who translated this book into Chinese.

Bruce D. Browner, MD, MHCM, FACS