SECOND EDITION

HEALTH CARE OPERATIONS MANAGEMENT

A Systems Perspective

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Dr. James Langabeer is a professor of informatics, health care management, and emergency medicine at the University of Texas School of Public Health at Houston. He has spent most of his career focused on quality improvement and information technology in hospitals and health care. His career has involved hospital executive administration, information technology startups, management consulting, and health care research and teaching. Dr. Langabeer was the founding chief executive officer of Greater Houston Healthconnect (the regional health information network serving Southeast Texas) and helped move the organization from concept to reality. He was the executive vice president of a technology and consulting firm based in Boston that was widely touted as "best of class" in thought leadership on predictive modeling and business intelligence. He has lived and/or worked extensively in Boston, London, Paris, Rotterdam, and Tel Aviv, as well as Houston. He has served on the faculties of the University of Texas, Boston University, and Baylor College of Medicine.

Dr. Langabeer has served as principal investigator on many national research projects. He has been funded by the American Heart Association, the U.S. Centers for Disease Control, Health and Human Services, and many other agencies and foundations. He has more than 85 publications that can be found in some of the highest-rated management and clinical journals such as the *Journal of Emergency Medicine, American Heart Journal, Pediatrics, Health Care Management Review, Quality Management in Health Care,* and *Health Care Management Science.*

Dr. Langabeer earned his PhD from the University of Lancaster in England in management science, an EdD in leadership from the

University of Houston, and an MBA from Baylor University. He is also an Emergency Medical Technician with Advanced Cardiac Life Support certifications, a Certified Management Accountant, and a Fellow in the Healthcare Information and Management Systems Society.

Jeffrey Helton, PhD, CMA, CFE, FHFMA

Courtesy of Jeffrey Helton

Dr. Jeffrey Helton is an assistant professor of health care management at Metropolitan State University of Denver. He also holds an adjunct faculty appointment in health care management at The George Washington University and in health informatics at the University of Denver and health informatics at the University of Texas School of Biomedical Informatics. The majority of his career has been spent as chief financial officer for several health care systems across the United States, where he led several turnarounds of organizations previously in bankruptcy or receivership. During his career as a financial executive, he identified several operational challenges in hospitals and health plans that required development of staffing standards, labor management processes, and internal financial controls to restore financial stability to organizations. He has since supported other health care organization turnarounds as a consultant, assisting in the analysis of labor costs and development of labor control programs.

As a part of his consulting work, Dr. Helton has also served as chief financial officer of the Disaster Housing Assistance Program on behalf of families displaced from their homes as a result of Hurricanes Katrina and Ike. As custodian for more than a quarter billion dollars in federal funds, he became a Certified Fraud Examiner and provided fraud prevention assistance to the agencies assisting victims of these natural disasters. He has also used his background in fraud detection to assist several health care organizations in developing fraud prevention and detection programs and has provided material support to many health care fraud prosecutions, resulting in multiple millions of dollars in recovered fraud losses.

Dr. Helton is a Fellow of the Healthcare Financial Management Association, where he serves on its board of examiners. He also volunteers his financial management expertise to the Association of University Programs in Health Administration, where he serves on its finance

committee and as treasurer of the Health Care Management Division of the Academy of Management and a member of the finance committee of the Colorado Association of USA Track and Field. He is a Certified Fraud Examiner and a member of the board of advisors for the Association of Certified Fraud Examiners. Dr. Helton is also a Certified Management Accountant.

Dr. Helton earned his PhD in public health management from the University of Texas School of Public Health, an MS in hospital and health administration from the University of Alabama at Birmingham, and a BS in business administration from Eastern Kentucky University. He is a journal article reviewer for *Healthcare Financial Management, Journal of Healthcare Management, Social Science and Medicine,* and *Journal of Public Health Management and Practice.*

Table of Contents

List of Figures and Tables

Figures

Tables

New to the Second Edition

In recent years, there has been a heightened awareness of the effect that efficient and successful management of the health care organization can provide. New federal policies and new payer reimbursement models are just two examples of how the industry is changing. The discipline of health care operations management is key to the success of these changes and to organizations in general. Operations management focuses on improving clinical and administrative processes, streamlining costs, and ensuring high-quality outcomes while optimizing available resources—all of these are critical to organizations that are struggling to compete and survive in an era of constrained reimbursements. The first edition of this book was widely adopted by universities throughout the world, and due to demand and our desire to make operations management current and relevant, it seemed an appropriate time to introduce the second edition. This revision of the book offers an expanded coverage of quality, financial, and systems management.

We would like to thank Jones & Bartlett Learning for their leadership in publishing this second edition. We would also like to thank the thousands of readers and dozens of professors who read the first edition and offered their opinions and insights for revisions. We truly appreciate your help with and continued support of this second edition.

The encouragement of friends and family helped us complete this book, which was quite an undertaking! We would also like to acknowledge the wonderful editorial assistance from Elizabeth Vogler, MA from the University of Texas School of Biomedical Informatics. She was tremendously helpful in organizing chapters and giving all of the material a final read.

Many changes, improvements, and additions were made in response to valuable comments by readers and users. First, there were several errors in the text and these have all been fixed. Dr. Jeffrey Helton, a significant researcher in health care finance and operations management, was added as a coauthor to the text to provide greater coverage on certain topics. All chapters were made current in terms of statistics and updated references and were edited for the purpose of clarifying some material, correcting a few minor errors, improving language and syntax, and generally updating material. Some chapters were merged and combined, and a few new chapters were created. In all, the second edition contains 17 chapters, which will allow the academic reader to complete one chapter per week during the semester. The more significant changes are encapsulated as follows:

- Chapter 1, "Health Care Operations and Systems Management," was augmented greatly by the addition of sections on management decision making. Because the ultimate purpose of operations management tools and methods is to improve decision outcomes, we felt it was appropriate to expand the discussion of decision making.
- Chapter 2, "Health Care Marketplace," provides greater detail on current health policies and their effect on the health care environment. There is a discussion of the Affordable Care Act and other relevant federal policies.
- Chapter 3, "Health Care Finance for the Operations Manager," was expanded and reworked to include new reimbursement models, information on how payers reimburse provider organizations, and an examination of how an organization is paid can effect operations management.
- Chapter 4, "Quality Management," provides significantly more detail on Six Sigma and Lean methods, which have been continuously increasing in adoption in recent years.
- Chapters 5 and 6 were updated and augmented with additional theory around operations research and practical examples.
- Chapter 7, "Operational Metrics in Health Care Organizations," is a new chapter that details the key metrics in operations management. These metrics include discussion of full-time equivalent, adjusted patient days, and other productivity metrics. Additional details on sources of labor data to enhance the accuracy of calculating labor management metrics are also included.

- Chapters 8 through 10 were updated and information was consolidated.
- Chapters 11 through 15 represent the supply chain management areas. These chapters were consolidated where needed and also revised and improved. They include greater coverage of forecasting and supply chain management systems.
- Chapter 16 blends a new component focused around operational analysis and benchmarking and provides integrative examples for operations management. Because analysis and comparison of units to others has become so widespread, we felt it important to add sections on how to make proper comparisons.

Preface

Although less than 5% of the American population currently works in a health care system, the overwhelming majority of adults have been a patient or a guest at a hospital, clinic, or physician's office. Of those, while most remember the quality and care given by nurses and physicians, many have left the facility with an overwhelming feeling of disdain for the inefficient and time-consuming business processes. Excessive wait times, lack of coordination among different departments, duplicate entry of personal information in multiple manual forms, unfriendly facilities, and general lack of customer service are typical attributes assigned to health care organizations. Although outcome data suggest that the quality of medical care is improving for most types of illness, the attention to detail in day-to-day operational management has not kept pace.

In a time when hospitals' financial situations are increasingly being called into question, hospitals are now starting to get serious about creating operational efficiencies to become more competitive and financially viable. Do hospitals and clinics exist to make profits? Some do; however, most do not. Either way, if hospitals are to survive dismally poor health care economics, escalating costs, and increasing competitive pressures, they must apply sound business management. This will ensure that hospitals earn the reasonable return on investment necessary to continue to invest in and upgrade buildings, programs, and employees.

A very active debate continues at the national level, primarily focused on health policy research. New programs and policies centered around the concepts of "pay for performance," quality and accreditation, flawed government funding mechanisms, federal and state regulations, publication and sharing of outcome data with the public, and other aspects of the U.S. health care system continue to address structural issues that affect the quality and costs of care in general. In addition, behavioral research into physician judgment and mechanisms to

encourage elimination of unnecessary tests and treatments will likely change medical education in the future. All of these can help improve the industry's economics and market structure. But, for now, hospitals and systems must continue to look internally at their own operations and management to adapt and thrive in current conditions. Hospitals cannot wait for policy to address the structural issues driving health care costs—they must apply inspired management to improve organizational performance today.

Principles of operations management, whether they focus on productivity or supply chain management, are common in other industries but have yet to really catch on in health care. There has been a reluctance to admit the applicability of business optimization techniques to the health care industry in general. This, coupled with the lack of sophistication and management education on the part of health care managers, limits the ability to fully understand and utilize the concepts, methods, and techniques offered.

Up until about two decades ago, business managers in health care were considered low-level "paper pushers." Senior administrators at most hospitals tended to be clinically trained and did not see as much value in managing business issues as medical ones. Of course, at that time most hospitals were reimbursed fully for all operational costs and capital costs, plus a small margin. With guaranteed profits, there was not a big drive for efficiency and productivity management. Times have changed.

However, most books on health care business management still focus primarily on issues of either governance or finance—both of which are important topics but alone are not comprehensive. Coverage of revenue cycle issues such as reimbursement, patient billing, coding, and collections are well addressed, as are basic accounting and financial reporting topics. Similarly, governance issues such as improving physician relations are well documented. Yet, as important as these topics are, it leaves most of business operations fairly uncovered.

This text focuses on the practical application of operations management techniques in health care organizations, including hospitals, clinics, multiple-hospital systems, and other facilities in an integrated delivery network. For clarity purposes, however, the term *hospital* is widely used in this book, and it refers broadly to any large organizational entity—*hospital* is simply easier to use as the unit of measure than

integrated delivery network, health care system, clinic, or the like. Hospitals remain the predominant hub of the health care system, and they employ the majority of workers and resources, so they make more lucid examples for most concepts illustrated here. The tools and techniques used in this text, however, are just as relevant to other health care facilities.

This book concerns itself primarily with the topics that have not been extensively treated in health care texts, which are the operational components of health care. These include all areas that help hospitals improve productivity, reduce cycle times, measure performance, analyze activities, compare organizations to others, improve cost management, and generally create business value by converting resources into services. Hospital operations management concerns itself with a few key themes, all of which will be covered in this text: productivity analysis, supply chain management, business process and service design, quality management, inventory management, technology and systems, operational planning and scheduling, and performance improvement. All of these are traditional operations research topics that, when applied to hospitals and health care organizations, cover the majority of resource consumption.

This book was written to help practicing executives and administrators, as well as students in undergraduate and graduate health care administration programs, understand the importance of sound operational management by using business strategy and logistics to create a competitive advantage for their organization. It presupposes that there will be a growing need for improved cost efficiencies and economics in the coming years, and this mindset is required if hospitals are to survive competitive pressures. The significance and role of business professionals in health care will continue to evolve and improve over time, and therefore it is mandatory that the skills and expertise of hospital business officers continue to improve.

The framework for this book uses a practical perspective of operations management and attempts to set a path for hospitals to pursue a strategy of operational excellence. Therefore, the problems this book addresses are those that are integrated around operations and logistics management, as displayed in **Figure P1-1**.

This book will help hospital and health care administrators to address important operational and day-to-day issues in this rapidly evolving industry. This book should be used as a reference guide for those

working in hospital administration, clinic management, performance improvement, and all other areas of management and it serves three purposes:

1. Present concepts and techniques about improving daily operations capabilities and capacity in health care.
2. Educate students and administrators on the value of clinic and business operations, with a strong focus on analytical models for decision making.
3. Help health care organizations improve their performance and outcomes.

It is our hope that this book will stimulate significantly more research and publication on mastering operations research in health care and using advanced techniques to drive improved competitiveness into health care.