

SECOND EDITION

QUALITY HEALTH CARE

A GUIDE TO
DEVELOPING
AND USING
INDICATORS

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Contents

Acknowledgments	vii	Focus Groups	66
Foreword	ix	Observation	66
Introduction to the Second Edition	xii	Personal Interviews	67
About the Author	xv	Leadership Walk-Rounds	67
Chapter 1 Setting the Context for Measurement	1	Unsolicited Feedback	67
The Growing Demand for Transparency	2	High-Tech Tools	68
The Growing Focus on Patient-Centered Care and Service	12	The Experiential Shopper	68
The Quality Funnel	19	Surveys	69
References	24	References	93
Chapter 2 Why Are You Measuring?	25	Chapter 4 Milestones in the Quality Measurement Journey	95
Connecting the Dots!	25	Developing a Measurement Philosophy	95
Types of Studies	28	Measurement Roadblocks	97
Research for Efficacy, Efficiency, and Effectiveness	30	Milestones in the Quality Measurement Journey	101
The Three Faces of Performance Measurement	33	Selecting a Specific Indicator	106
References	44	Developing Operational Definitions	111
Chapter 3 Measuring the Voice of the Customer	47	Developing Data Collection Plans	115
It All Starts with Listening	47	Probability Sampling	119
Creating a Service Excellence Culture	48	Nonprobability Sampling	123
Who Are Your Customers?	57	The Indicator Development Worksheet	129
Defining Key Quality Characteristics	59	References	143
Listening Three Times	62	Chapter 5 Organizing Indicators into a Strategic Dashboard	145
Understanding VOC Tools	63	Evolution of the Strategic Dashboard	146
		Focusing on the Vital Few	153
		The Role of Benchmarking	159
		References	176

Chapter 6 Tapping the Knowledge That Hides in Data 177

Data Versus Information 177
 Static Versus Dynamic Approaches to Data Analysis. 181
 References 187

Chapter 7 Overcoming Numerical Illiteracy. 189

Understanding Variation Conceptually 189
 Distinguishing Common from Special Causes of Variation 197
 Making the Appropriate Responses to Common and Special Causes of Variation. 200
 References 203

Chapter 8 Understanding Variation with Run Charts 205

What Is a Run Chart? 205
 How Do I Construct a Run Chart? 206
 How Do I Analyze a Run Chart? 208
 References 227

Chapter 9 Understanding Variation with Shewhart Charts 229

Run Charts Versus Shewhart Charts 229
 What Is a Shewhart Chart? 229

Key Questions About Shewhart Charts. 232
 Deciding Whether a Special Cause Is Present. 237
 Deciding Which Shewhart Chart Is Most Appropriate 243
 Types of Data 244
 Types of Shewhart Charts. 248
 Defining the Key Terms 249
 You Make the Call 260
 Additional Shewhart Charts. 265
 Using Shewhart Charts Effectively. 267
 References 275

Chapter 10 Applying Quality Measurement Principles . . 277

References 349

Chapter 11 Connecting the Dots. 351

Adopting Quality as a Business Strategy. 352
 Developing a Learning System to Support Improvement 356
 Linking Measurement to Improvement 359
 Building Capacity and Capability for Improvement 366
 References 380

Index 000

Acknowledgments

Anyone who thinks that writing a book is a solitary activity is sorely mistaken. Sure, authors do squirrel themselves away when developing the content, conducting research for the book, and writing chapters. But writing a book is more of a team sport than anything else. I have had the pleasure of being part of the Jones & Bartlett Learning team since the fall of 2000. That was when Mike Brown, publisher at JBL, informed me that the group I thought I was writing a book for decided to get out of the healthcare publishing business. The rights for the first edition of this book were then transferred to Jones & Bartlett Learning and, as the expression goes, this was the beginning of a beautiful relationship.

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as well as the challenges they face in terms of realizing these visions, and, most important, those who work tirelessly each day to deliver care and support to those in need. These are the individuals who have been kind enough to share their stories and experiences with me and helped to set the context for this book. The case studies presented in Chapter 10 all stem from interactions with these individuals. Those who have made substantive contributions to the content or case studies are recognized in various chapters and the footnotes.

I also want to thank Dr. Don Berwick for kindly writing the foreword to this second edition. I have known Don for almost 30 years. In 1992, he invited me and a colleague, Dr. Ray Cary, to teach a daylong program on the application of statistical process control (SPC) methods to healthcare situations at the Institute for Healthcare Improvement's (IHI) National Quality Forum. This was one of the first exposures many healthcare professionals had to SPC. These initial workshops were so successful that Don invited us back to the forum each year and then encouraged us to write a book for healthcare professionals focused on quality measurement and in particular SPC applications. I have been

dedicated to the quality measurement journey ever since. In 2005, Don invited me to join the IHI as a full-time employee. We have traveled many roads together over the years and I am grateful for his support, guidance, and willingness to contribute to this edition.

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Foreword

In the now 30-year history of bringing modern quality methods into the control, improvement, and planning of health care, skeptics sometimes comment on the “religious” tone of that movement. Leaders and others in the workforce who get the quality “bug” seem to buzz with their enthusiasm. They adopt phrases like “joy in work,” “pursuing perfection,” and a “never-ending journey” and sprinkle their vocabulary with unfamiliar technical expressions, like “PDSA cycles,” “high reliability organizations,” and “statistical process control.” And, they seem to think they are right, lamenting together that too many others do not see what they, at last, see.

So it does, indeed, seem to newcomers as if a religion, or at least a cult, has arrived in town. The “immune reaction” can be strong.

If you are of that mind, think again. Imagine, maybe, that what these newfound enthusiasts are evincing is not religiosity but intellectual excitement. To overstate, what might Galileo have felt when, for the first time in human history, he saw those moons of Jupiter and realized that they must be orbiting a sphere? Or, more mundane, what did my 5-year-old grandson, Caleb, feel last weekend, when all of a sudden at a Sunday lunch he “got” the idea of letters spelling a word. (It was the word “bark.”) Like Galileo, maybe, he laughed out loud.

I do not know why for so many decades health care called itself “modern,” which it technically became in the era of bioscience, but remained distinctly “unmodern” in its understanding of its work as a system—complex, interdependent,

and improvable. My teachers in medicine taught me to be a heroic individual problem solver. My mentors in organizational management taught me to use incentives, hierarchy, and accountability to extract excellence. The language and tools of improvement revealed the underlying theory that “trying harder” was the route to success and that metrics somehow—magically—led to results.

Ideas like that now seem to me to be a pervasive form of system illiteracy. They are not scientific. I simply did not know that for much of my early career because it was, before I studied systemic quality sciences, as evident to me that effort is the root of results as it was to most people before Newton that apples fell because they just moved toward the center of the universe.

It took breakthroughs in a number of sciences to reach today’s level of understanding of how things get better, or worse, in complex systems. That understanding—call it “quality sciences” if you need a name for it—came through eventually intersecting lines of progress in statistics, general systems theory, cognitive and behavioral psychology, epistemology, and more. It also continues to be dynamic. Like all sciences, quality sciences are in continual evolution and increasingly powerful.

Happenstance introduced me to these sciences in my mid-forties, and I have never looked back. By understanding systems better, by relearning how to interpret and learn from variation, by realizing how informative very small-scale, local tests of change can be, by rethinking my theories

of human motivation and communication, I was able to see more clearly where defects were coming from and how to find and change their causes. Those subjects, mastered over time, gave me lenses and tools far more persuasive and helpful than the atheoretical approaches of the first part of my career.

Maybe it was an epiphany of sorts. But there was nothing at all “religious” about it. I just learned things I had not previously known—new guides to effective action. Someone showed me Jupiter’s moons.

That’s not comfortable, at least at first. It is not easy to let go of theories closely held, even when shown logically to be wrong. Galileo paid a huge price for that in a public that found misconception less disruptive than changed perception. And so, the jargon and excitement of the quality sciences are easy prey to those whose beliefs are time honored, though wrong.

To accept the change in understanding depends in part on teachers—people with the patience to meet learners where they are and walk them down the path of new perception. Like religion this takes empathy and compassion. But, far from faith-based change, this job also takes rigor and commitment to science. I love the quotation from Albert Einstein at the entrance to the Keck Building headquarters of the National Academies of Sciences, Engineering, and Medicine: “The right to search for truth implies also a duty; one must not conceal any part of what one has recognized to be true.” If that be a religion, sign me up.

And that brings us to this book, *Quality Health Care: A Guide to Developing and Using Indicators*, and to its author, my longtime friend, mentor, and colleague, Bob Lloyd. No topic is more thoroughly a battleground between the older, and unscientific, methods of improvement and the newer, more theoretically grounded methods that I call “modern” than is the topic of measurement. And few topics generate more controversy at first.

The prior, hegemonic, view of measurement is that it causes improvement and is therefore a powerful tool for implementing a theory of exhortation, accountability, and incentive. Not so. Get in touch with the workforce and ask them how it is going with the metrics in their work lives, and they will tell you how scrutinized they feel and how demoralized, threatened, and misunderstood they feel by that scrutiny. They will equate measurement with waste and risk, not growth and learning.

The scientific approach to improvement also values measurement, but it is measurement for learning, not measurement for judgment. It knows, in the words of an African proverb, that “weighing a pig does not make the pig fatter.” But it also knows that careful, respectful metrics, linked with sound interpretation of variation, trust in the workforce, methods for local trials and tests, celebration, and supports for innovation, can be invaluable in continual improvement. And that all of this matters in the search for knowledge, put to use.

Bob Lloyd is the best teacher I have ever met in those vineyards of measurement-for-improvement. He is stunning in the classroom. I have teased him often about how relentlessly at the top his ratings are in the many Institute for Healthcare Improvement conferences where he is an instructor. It’s very hard for the rest of us, like watching a gymnast do what is for normal people impossible. We watch him in awe as he takes novices by the hand and in days shapes them into expert interpreters of variation and, therefore, far more helpful quality champions in their home organizations.

This book is a resource for that change, written by a master. Bob has been able to skillfully blend the quantitative aspects of the science of improvement with the more qualitative and strategic aspects that allow organizational transformation to flourish. In the final chapter he provides clear guidance on how to “connect the dots” by linking measurement efforts to

improvement. As he points out, “Data without a context for improvement are useless!” We have a long way to go yet in grafting quality science into the core of our healthcare systems, but those who really want to do it, to help our patients, their families, and our communities, have no better place to turn for their development than to this book and this teacher.

It’s not a religion. It’s intellectual progress, personal and cultural. So, welcome it, and read on.

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Introduction to the Second Edition

The previous edition of this book outlined the foundation for applying statistical process control (SPC) methods to healthcare situations. As I have used this book to teach classes and seminars on SPC, however, it soon became clear to me that a number of measurement challenges were still facing healthcare professionals. Specifically, I discovered that the key concepts related to SPC, such as common and special causes of variation, variables and attributes data, and proper control chart selection, were quickly being grasped and understood. What healthcare professionals seemed to be struggling with most often, however, was something I had taken for granted. I had assumed that people knew what they wanted to measure and how to organize data collection efforts. It is difficult to apply control chart knowledge properly if you have not defined appropriate indicators and collected data that accurately represent the process being measured. SPC charts developed from incomplete operational definitions and poor data collection strategies may look nice graphically but they have limited utility for improving care processes and building knowledge. Helping healthcare professionals address issues related to indicator development, data collection, and statistical analysis, therefore, are the primary objectives of this edition.

This edition is a completely revised version of the first edition. The first edition contained

8 chapters whereas this one has been expanded to 11 chapters. The context for this edition has also been expanded. In the first edition, the context was based on events occurring in the U.S. health system. My work over the past 12 years has allowed me to expand my perspectives by working in many different countries and experiencing a variety of health and social care delivery systems. In this current edition, therefore, I have included examples of my work and experiences in other countries.

Chapter 1 provides a context for understanding quality measurement with a central focus on four key issues: (1) the growing demand for greater transparency of healthcare performance indicators; (2) the increasing role that patients, families, and caregivers are playing in making healthcare decisions; (3) the increasing use of quality improvement (QI) concepts, tools, and methods; and (4) the definition of quality. This chapter provides an overview of some of the key historical as well as recent forces that have shaped the transformation of the healthcare industry throughout the world. It concludes by discussing three key definitions of the term quality that often lead organizations to send mixed messages about the role of quality and what they are trying to achieve.

In Chapter 2, a simple question is posed to challenge the reader. Specifically, “Why are you measuring?” There is constant and ever-growing

demand to measure healthcare performance across the globe. But to what end? Is it to do academic studies, pass judgment on performance, and hold healthcare providers accountable for their actions or to improve the efficiency, effectiveness, and safety of healthcare delivery?

Measuring the voice of the customer (VOC) is the topic of interest in Chapter 3. This chapter is greatly expanded from what I covered in the first edition. All quality journeys should begin by listening to the VOC, the point at which you can learn what your customers want, need, and expect. The growing role of the customers and methods for documenting and analyzing their expectations are the central topics in this chapter. Three key listening points in the customer experience are identified (preservice, point-of-service, and postservice), and a variety of tools designed to capture data at these critical junctures are reviewed. Because surveys are used so much in health and social care settings I have added a large section in this chapter to address the design, development, and use of surveys. This chapter ends with a brief example of how VOC measurement needs to be connected with voice of the process (VOP) measurement in order to make continuous QI a practical reality.

Chapter 4 provides details on the milestones in the quality measurement journey (QMJ). All too often organizations take a serious detour in their QMJ because they try to measure a broad concept (e.g., patient harm) rather than identifying specific indicators that could be used to measure actual performance (e.g., medication errors per 1,000 doses dispensed or the percentage of patients appropriately placed on bed alarms). This chapter provides specific guidance in selecting indicators, developing operational definitions, and executing data collection strategies (including stratification and sampling). An Indicator Development Worksheet is offered to assist the reader in working through all the issues involved with selecting and building a few good indicators. This chapter ends with a case study

on transcription turnaround time to demonstrate how a successful QMJ can be completed.

After a number of specific indicators have been developed, there is value in organizing them into a cogent and parsimonious format that can be shared with those who do not need to know all the details involved with indicator development. Chapter 5 provides guidance on how to accomplish this by building strategic dashboards. The discussion begins by characterizing the similarities and differences between two popular ways of organizing indicators—report cards and dashboards. The argument is made that the dashboard concept is much more relevant to healthcare performance measurement than is the notion of the report card. A case study provides a practical example of how one healthcare organization in London has built a very effective strategic dashboard. Chapter 5 concludes with a review of the role of benchmarking in healthcare settings.

After collecting data and organizing your indicators, the next major milestone in the QMJ is to tap the knowledge that hides in the data. Chapter 6 addresses two fundamental issues related to this challenge: (1) the differences between data and information and (2) how static and dynamic approaches to data analysis provide fundamentally different perspectives to data analysis. A case study on presenting data to a management team is used to illustrate the importance of building a dialogue on these issues.

With these distinctions established, Chapter 7 provides a way to start immunizing yourself and others against numerical illiteracy. This requires that everyone in the organization needs to have a clear understanding of what Dr. Walter Shewhart established as a fundamental principle for interpreting data aimed at QI. Specifically, his distinction between common and special causes of variation needs to be the primary way that everyone in the organization approaches data analysis and interpretation. Yet, the frequent use of aggregated data and summary statistics compounded by data presentations that rely on

red/yellow/green display of the data creates major challenges for most healthcare providers when it comes to understanding variation. Options for moving to a new way of thinking are offered in this chapter.

Chapters 8 and 9 provide details on how to understand variation statistically with SPC methods. Specifically, Chapter 8 focuses on the run chart and Chapter 9 dives into the details of the Shewhart control charts. The statistical and operational foundations for using these practical statistical tools are discussed as well as the basic elements of the charts, decision criteria for selecting the appropriate chart, and rules for detecting special causes of variation. These chapters provide case studies as examples and exercises to test the reader's knowledge of selecting the most appropriate Shewhart chart for various indicators.

Chapter 10 presents 16 case studies designed to demonstrate how the various quality measurement principles and tools can be applied to healthcare situations. These examples span a wide range of topics, including indicator selection and development, sampling applications, and control chart analysis. The case studies address clinical as well as operational aspects of healthcare delivery. All of these case studies are grounded in actual experiences I have had in applying the QMJ principles. In some of the cases the organization or individuals who were kind enough to share their stories are identified.

In other case studies I have respected individual wishes to remain anonymous. For all of those involved with sharing their stories, I am grateful.

In the concluding chapter, Chapter 11, I move away from the technical details of the QMJ and address how an organization can strategically and operationally build quality thinking and action into the very fabric of the daily life. Four key strategies for accomplishing this are discussed: (1) adopting quality as a business strategy, (2) developing a learning system to support improvement, (3) linking measurement to improvement, and (4) building capacity and capability for improvement.

My design for this book has been to start rather broadly by establishing the context for measurement. It then proceeds to become more detailed and specific as I describe the milestones in the QMJ and their technical components. It then concludes by moving back to a broad perspective describing how an organization can establish the structures, processes, and culture required to demonstrate that every day is truly a quality journey. Some readers may want to start at Chapter 1 and progress in a logical sequence through the chapters. Others should feel free, however, to jump around from chapter to chapter depending on their interests. Each chapter has been written to stand more or less on its own. So, follow your own path and enjoy the journey.

About the Author

Dr. Robert Lloyd is vice president at the Institute for Healthcare Improvement (IHI). Dr. Lloyd provides leadership in the areas of performance improvement strategies, statistical process control methods, development of strategic dashboards, and building capability for quality improvement (QI). He also serves as lead faculty for various IHI initiatives and demonstration projects in the United States, the United Kingdom, Sweden, Denmark, Norway, New Zealand, Australia, Qatar, Dubai, and Africa. Before joining the IHI, Dr. Lloyd served as the corporate director of Quality Resource Services for Advocate Health Care (Oak Brook, IL). He also served as senior director of quality measurement for Lutheran General Health System (Park Ridge, IL), directed the American Hospital Association's Quality Measurement and Management Project (QMMP), and served in various leadership roles at the Hospital Association of Pennsylvania. The Pennsylvania State University awarded all three of Dr. Lloyd's degrees. His undergraduate degree is in sociology, his master's degree is in regional planning, and his doctorate is in rural sociology.

Dr. Lloyd has addressed over 2,500 national and international meetings of professional groups and associations. Over 200,000 participants from the United States and abroad have attended his classes and presentations on QI. He has served as faculty for the Harvard School of Public Health, the American College of Healthcare Executives, the American Society for Quality (ASQ), the University of Wisconsin's graduate program in administrative medicine,

the University of Chicago's graduate program in health administration, the Healthcare Forum, the International Quality and Productivity Center, the American Health Information Management Association, the Joint Commission, the Group Practice Improvement Network, the Ontario Hospital Association, the Vancouver (British Columbia) Quality Forum, the Medical Group Management Association, the BMJ European Quality Forum (London, Barcelona, Berlin, Amsterdam, Goteborg, and Paris), and numerous QI organizations around the United States. Dr. Lloyd has also presented his seminars on statistical thinking to physicians and administrators from the Federation of County Councils in Stockholm and Jonkoping, Sweden, to leaders of the National Health Service throughout the United Kingdom and New Zealand, and to patient safety leaders throughout Denmark, South Africa, and Ghana.

He has published numerous articles, chapters, and reports on a wide range of topics, including QI theory and implementation, measurement and statistical methods, clinical outcomes, customer satisfaction, information systems, and parish nursing.

Dr. Lloyd is coauthor of the internationally acclaimed book *Measuring Quality Improvement in Healthcare: A Guide to Statistical Process Control Applications* (American Society for Quality Press, 2001, fifth printing). His most recent book, *Quality Health Care: A Guide to Developing and Using Indicators*, was published in March 2004 by Jones & Bartlett Learning.