Practice-Based Learning and Improvement:
A Clinical Improvement Action Guide
SECOND EDITION

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In the unique and ever-changing context of real world clinical practice, what forms of knowledge and skill are required to achieve the best patient care? Abundant data make clear that clinicians’ technical competence and scientific knowledge, although necessary components of such care, are not sufficient to guarantee its consistent delivery. Numerous studies document the significant chasm between biomedical knowledge, which is extensive, and optimal clinical outcomes, which are frequently not achieved. To close this gap, and to ensure care that is safe, effective, and open to continuous reflection and improvement, health professionals must connect their scientific knowledge to daily work patterns and embrace opportunities for practice-based learning as they continually arise.

This chapter introduces a framework for understanding clinical quality and practice-based learning and continuous improvement as these become manifest in real-world health care settings. We begin by sharing a tale of two patients whose disparate outcomes, in the context of similar events, underscore the high stakes of clinical improvement work. We explore the foundations of quality improvement in clinical practice, with attention to systems of knowledge that are required for optimization of patient care, and we emphasize the evolving nature of health outcomes that are the final measure of this care. Discussions of continuous quality improvement must be grounded in the reality of clinicians’ daily work and directed to the priorities of individual patients; our goal in this first chapter is to introduce language and concepts that support this vital discussion.

A Tale of Two Patients: An Actual Case*

At the end of one recent and typically busy office session, cardiologist Dr. William Barr paused to reflect on two male patients seen in his clinic that morning. Jim Burke and Tony Lamont were both in their late 50s, and both had suffered acute myocardial infarctions (AMIs) six months earlier. At today’s visits, Dr. Barr was impressed that despite the similarity of these patients’ initial cardiac events, their clinical outcomes were dramatically different.

Jim Burke reported with satisfaction that he felt considerably healthier now than he had before his AMI. He had lost 20 pounds through a regimen of healthy diet and regular exercise and had experienced no recurrence of anginal symptoms. He had returned to his job and engaged in both work and play without functional limitation. His blood pressure and serum lipid levels were in optimal range, as specified by evidence-based guidelines. He felt, overall, quite free from anxiety, and expressed rational optimism regarding his future health outlook. He voiced pleasure with the cardiac care he had received, and bragged that he felt “better now than I have in years.”

Tony Lamont, on the other hand, was decidedly unhappy with his current clinical status, and for good reason. He had been unable to return to prior work because of recurrent episodes of shortness of breath and palpitations; his energy and exertional tolerance were poor because of sustained

*Names in this case and all cases in the book are fictitious.
myocardial damage. He had been hospitalized twice after experiencing his initial AMI and was concerned about the large medical expenses and significant co-payments that had depleted his savings. His cardiac risk profile remained suboptimal (hypercholesterolemia, hypertension, overweight, clinical anxiety); he acknowledged feeling “down in the dumps” and expressed genuine concern about his future. Tony had scheduled today’s visit with Dr. Barr for a second opinion. Although he liked his own physician, he also hoped that a new perspective might help him to recover his sense of lost health and to get his life “back on track.”

As Dr. Barr reflected on these divergent clinical outcomes and on the variation in clinical care which (his chart review suggested) was a likely contributor to this divergence, he grew aware of his own ambivalent response. Jim’s successful recovery made clear what was possible in the provision of modern medical care, but Tony’s unfortunate decline highlighted persistent barriers to delivery of that optimal care in his own community. Although differences in both premorbid health status and precise location of coronary obstruction will of course significantly affect post-AMI outcomes, these differences did not appear substantial in the case of Jim and Tony. More significant were variations in the content, timing, and coordination of specific interventions. Details of both men’s hospital and posthospital therapy are elaborated in Sidebar 1-1 (below).

What is most notable for our current discussion is Dr. Barr’s appreciation that the clinical professionals involved in these two patients’ care did not differ significantly in terms of scientific knowledge. Well-trained physicians and staff were employed at the sites where each man received their initial treatment. In one case, however, systemwide strategies had been established to ensure that scientific knowledge was appropriately implemented; in the other case, this same scientific knowledge was not coupled with work processes at the front line of care to support thorough and timely delivery of evidence-based interventions. The consequences of this difference will continue to be felt not only by Jim and Tony, but also by their families, their employers, and the payers of their increasingly divergent health care costs.

SIDEBAR 1-1. A Tale of Two Patients, Continued

As the main chapter text suggests, differences in premorbid health status and in the precise location of coronary obstruction were less substantial, in the cases of Jim and Tony, than were variations in the content, timing, and coordination of specific interventions. Jim received evidenced-based interventions (including aspirin and a beta-blocker) within minutes of electrocardiographic (ECG) demonstration of his acute infarction, and phone contact with an interventional cardiologist (to expedite cardiac catheterization) was initiated simultaneously. Tony’s ECG interpretation was delayed, and in the absence of standard orders and protocols, so was the initiation of cardiac medications and specialist consultation.

Both men underwent cardiac catheterization (though this occurred more promptly in Jim’s case) and both were noted to have significant obstruction of the left anterior descending coronary artery (which supplies the anterior wall of the heart and contributes substantially to left ventricular function). Both men’s vessels were successfully stented (reperfused) in the catheterization lab, and the patients were transferred to their hospitals’ cardiac care units for ongoing monitoring.

Subsequent to reperfusion, but still within the 24 hours of presentation, Jim was started on two additional medications, an angiotensin-converting enzyme inhibitor and a statin, to support cardiac pump function and to lower serum cholesterol. Tony received neither of these medications, though both were clinically indicated.

Within 48 hours of the presenting infarction, Jim received education from nursing staff and a hospital nutritionist, and both cardiac rehabilitation and timely follow-up appointments (with a primary care physician and with the outpatient cardiology clinic) were scheduled; specific appointment times were included with Jim’s discharge instructions. Tony received some nursing education as well, though in a less thorough and coordinated manner. At discharge he was instructed to contact his primary care physician to arrange for a follow-up appointment. Several weeks later, at that follow-up visit, Tony reported ongoing exertional intolerance. No medications were added, but outpatient referral was made to a general cardiologist.
Foundations of Continuous Quality Improvement and Practice-Based Learning
If our goal is to improve the care of patients in real-world clinical settings and to achieve this improvement in the context of real-world constraints on available resources, then we must commit ourselves to a process of reflection and learning that occurs in the "real time" of clinical practice itself. This process begins with an exploration of essential components in the work of quality improvement. Four foundational concepts require special attention: the priority of clinical outcomes, the necessity of universal engagement, the scope of improvement knowledge, and the functionality of clinical microsystems. The remainder of this chapter explores these four concepts in greater detail.

Clinical Outcomes Matter Most
In the final analysis, patients like Jim Burke and Tony Lamont are interested in clinicians’ biomedical expertise and evidence-based care only insofar as they affect their clinical outcomes. As shall be elaborated, multiple forms of knowledge are required to create a system in which positive outcomes are most likely to occur. Before analyzing those forms of knowledge in greater detail, however, reflection on the outcomes themselves is in order. What domains of experience matter most to patients in real-world practice settings, and what outcomes should guide a clinical team's continuous efforts in performance improvement?

In the cases of Jim and Tony, the domains of relevant outcome are readily apparent. A first domain is essentially biological: the impact of AMI (and of its treatment) on cardiovascular morbidity and on mortality itself. What physiologic and pathophysiologic changes occur as a result of the coronary event, and what benefits and complications are associated with medical treatment? Functional health status is a second domain of great importance. After surviving their myocardial infarctions, can Jim and Tony return to their prior employment, can they participate actively, productively, and happily in community and family life, and can they reduce their risk of experiencing further cardiovascular problems? Satisfaction against need is another essential outcome domain. How do Jim and Tony themselves perceive the goodness of care and services they received, and to what extent have their needs and expectations for care been met? Finally, the fourth outcome domain of cost includes both direct medical expenses (incurred in the provision of clinical care) and indirect social costs that arise from lost time at work, or from nonparticipation in other home-based or community-based affairs (that is, social role activities). Have these costs been minimized to the extent that is possible?

These four cardinal outcome domains are unified in the model of a Clinical Value Compass, elaborated in greater detail in Chapter 4. Each outcome domain can be explored, measured, evaluated, and improved on using methods that are introduced later in this book. As depicted in Figure 1-1 (page 4), the Clinical Value Compass helps us to clarify favorable outcomes—in terms of biological and functional status, satisfaction, and cost—which Jim Burke now enjoys. This same value compass directs us to health service domains that could become targets of improvement in the care of Tony Lamont. "Value" can be understood as a ratio of improved clinical quality over costs, and the outcome-based emphasis of Jim’s and Tony’s Clinical Value Compasses permits us to assess these measures more precisely. Subsequent chapters of this book analyze components of value in much greater detail and explore means by which all clinicians can participate in sustaining and increasing value.

The Work of Everyone
Because practice-based learning and improvement are not routinely built into clinical training experiences nor explicitly mandated in most job descriptions, many health professionals consider such activities to be outside their usual scope of practice and responsibility. Quality improvement (QI) thus becomes synonymous with extra (rather than essential) work, an add-on to the practitioner’s busy day. As a result, improvement tasks are delegated to special QI teams or resentfully squeezed in during administrative or personal time.

But when professionals can reflect on and reframe their implicit assumptions, clinical improvement is recognized as a necessary component of patient care itself. Highly effective practitioners and organizations, both inside and outside health care systems, understand that everyone has two jobs—to do the work and to improve the work. In health care (as in other service professions), this duality of activity, in turn, implies a third essential responsibility: Practitioners must endeavor to learn continually, so that both clinical care and its system-based improvement are performed with ever-increasing effectiveness and creativity.

Conceived in this way, the activities of patient care, practice improvement, and professional learning are interdependent and mutually supportive. As depicted in Figure
1-2 (page 5), QI work is understood more inclusively as “the combined and unceasing efforts of everyone—health care professionals, patients and their families, researchers, payers, planners, educators—to make the changes that will lead to better patient outcomes (health in physical, psychological, and social domains), better system performance (care that is safe, timely, efficient, equitable, and so forth), and better professional development (learning new knowledge, skills, and values).” Because these activities are indeed mutually supportive and universally assigned, there is no “extra” improvement work that is not really essential work, nor is there any time but now in which to perform it, nor anyone but ourselves (all of us) who can perform it.

Subsequent chapters return repeatedly to this assertion that better health outcomes, better care delivery, and better professional development are inextricably linked. There is optimism in this assertion, but also a challenge: The work of change and improvement must be understood as an intrinsic part of everyone’s job, every day, in all parts of the system. This is rewarding work, but it is by no means simple. We must therefore ask what new forms of knowledge and skill will be required. The remainder of this chapter specifically addresses this question.

**The Clinical Improvement Equation**

Experienced clinicians are well practiced in the art and skill of contextualizing scientific evidence—adapting general (and generic) recommendations to the unique needs, preferences, and capabilities of individual patients, and then monitoring the specific effects of this adaptation. “How does that clinical guideline apply to this patient in the office with me today?” We suggest that similar forms of translation and adaptation support continuous quality improvement at the level of health care systems, from local office settings to regional and even national networks of care. Here, too, both art and skill are required, and successful QI processes depend...
on very specific types of knowledge for their successful implementation.

Just as clinical practitioners combine knowledge of biomedical data with appreciation of individual patients’ needs and preferences, so do practitioners of continuous quality improvement integrate knowledge of generalizable scientific evidence with unique clinical practice environments. We can reflect on this integration in a manner that supports our work in practice improvement. The following Clinical Improvement Equation facilitates such reflective practice:

\[
\text{Generalizable Scientific Evidence} + \text{Particular Context} \rightarrow \text{Measured Performance Improvement}
\]

At first glance, this equation appears naively simplistic, but closer inspection reveals that it builds on complex and interdependent systems of knowledge. Indeed, not only the textual elements of this equation, but also its syntactic connectors, the “+” and “\(\rightarrow\)” signs, embed specific operational tasks and depend on specific cognitive skills. Figure 1-3 (page 6) identifies the discrete tasks in more detail, whereas Figure 1-4 (page 7) illustrates essential forms of knowledge required for successful performance of each step. Let us probe the components of this Clinical Improvement Equation more deeply:

- **Generalizable Scientific Evidence.** The essential function here is locating, acquiring, and evaluating biomedical knowledge. Practitioners of clinical improvement must be skilled in forming answerable questions, retrieving and prioritizing information through Boolean searches, critically appraising retrieved studies, and interpreting the use of analytic techniques. Clinician-scientists navigate this system of knowledge with (relative) comfort, as it rehearses the familiar methodologies of academic medicine and engages the traditional information base of biomedical literature. By testing hypotheses in context-free settings, the methods of this analytic system build a necessary foundation. The resulting knowledge, however, resides in journals, books, and electronic databases, so it is far from sufficient to actualize improvement in real-world clinical settings.

- **Particular Context.** Practitioners of clinical improvement are adept at characterizing unique practice environments, and this skill depends on a knowledge system that receives far less attention in biomedical training and literature. Essential activities in this domain include interpreting data (both quantitative and qualitative) on local priorities and performance, assessing the populations’ clinical and demographic
characteristics, and evaluating the organizations’ structures and interactions. What patterns, processes, and personalities support positive change, or hinder it, in this unique practice setting? What techniques might be applied to “diagnose” the local health system itself? In contrast to the first knowledge system—which eliminates consideration of local context by controlling for it in statistical models—this knowledge system focuses sharply on the particular setting and all that contributes to its “identity.”

- **The “+” Sign.** The acquisition of both generalizable scientific evidence and particular context information does not itself ensure that these separate forms of knowledge shall be successfully integrated. An additional bridging domain of knowledge supports the adapting of evidence and redesigning of practices. Effective leaders of change know how to assess innovations for compatibility with the current system, how to design and sequence specific care algorithms to match locally available resources, and how to manage conflict and negotiation in the context of unique practice histories.

- **The “→” Sign.** When we bridge the general and the specific to identify strategies for local change that are grounded in scientific evidence, another domain of expertise is required to support the actual execution of changes. Champions of continuous quality improvement are skilled in effective communication, in articulating a vision that compels group coherence, in supporting staff during stressful transitions, and in sustaining and embedding strategies for longer-term development. This knowledge system links strategic planning with human resource management to “make things really happen” in this particular place.

- **Measured Performance Improvement.** As described in subsequent chapters, successful improvement over time depends on reliable and recurrent measurement of provider and system performance. This method of measurement preserves time as a variable and seeks direct insight into the quality of results as these vary over time. Use of statistical process control charts, graphical displays, and other clinical assessment tools provides not only feedback data on improvement trends, but also “feed forward” information to facilitate point-of-care improvement in real-time practice.

Sustained and meaningful change is grounded in this full spectrum of knowledge systems derived from the Clinical Improvement Equation. The necessary skills can be learned (and we endeavor in this book to support that learning), and (more importantly) they can also be practiced! It is in this sense that continuous quality improvement and practice-based learning reveal their underlying identity. Our engagement in the work of improvement

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**Figure 1-3. Bringing Generalizable Scientific Evidence to Specific Contexts**

[Diagram of the Clinical Improvement Equation]

**Figure 1-3.** The discrete tasks represented in the Clinical Improvement Equation are shown.
brings these separate knowledge systems to life and compels us to unify them for the ultimate purpose of optimizing patient care.

**Systems and Microsystems of Care**

Mastery of these multiple systems of knowledge is a daunting task for the individual practitioner. Fortunately, however, neither patient care nor quality improvement must be played as a “solo sport” in the twenty-first century. In both these clinical endeavors, the challenge and the opportunity to health care professionals are to sustain not only individual but collective competence and to support a cumulative “whole” of knowledge, skills, and experience that is greater than the sum of all persons’ separate parts. Indeed, the efficacy of both clinical organizations and quality improvement teams derives in large part from the capacity of individuals to work together in, and as, well-integrated systems of care.

When Jim and Tony experienced their initial episodes of chest pain, they joined company in their respective health care journeys not with isolated clinical practitioners but with sequential professional members of clinical teams, and indeed with members of multiple teams. The points of transition between members of each team and between the teams themselves were critical moments in the determination of overall quality of care. The speed of emergency room evaluation, the communication between clinical and nursing and administrative staff, the transport to the catheterization lab, the delivery of medication, the writing of coronary care unit admission orders, the discharge to home, the coordination of outpatient follow-up, the referral (or not) to cardiac rehabilitation services—each of these hand-off steps shifted performance responsibility to a new clinical team in Jim’s and Tony’s ongoing care.

There is great utility in identifying these smaller working groups as the true functional units of clinical care. We call such groups (of people, information, and technology) **clinical Microsystems**, and elsewhere we have described their essential features in greater detail. Microsystems are the small, naturally occurring frontline...
units that provide most clinical care to most people. These units can be characterized in terms of functional processes, patterns of communication, and the skill sets of each participant. They can also be understood organizationally, in relation to both the patients they serve and the larger health care systems of which they are a part.

As depicted in Figure 1-5 (below), microsystems can be conceptualized as one of several levels in an expanding series of health services and determinants. At the center of any health system is the individual or family with an active health need. Successive rings in the figure depict the patient in relationship with a physician, nurse, or other trained provider—and then with the clinical microsystem itself, where patients, clinicians, and health care teams meet. Microsystems are supported in turn by larger mesosystems and macrosystems of care, which themselves are embedded in an economic, regulatory, and cultural environment that influences all levels of the health care system. These relationships are further characterized as follows:

- **Microsystems Are Both the “Ground” and the “Figure” of Patients’ Experience in the Health Care System.** In their journeys from myocardial infarction to eventual wellness or illness, Jim and Tony moved through many different microsystems of care. The emergency department, catheterization laboratory, cardiac care unit, cardiologist and generalist offices, and rehabilitation program were not only physical settings, the background against which health and illness were experienced, but were also active players, the “sharp end” of the health care system where quality, safety, satisfaction, and costs (that is, the Clinical Value Compass outcome domains) are continually created. Clinical outcomes depend on what patients such as Jim and Tony bring to each microsystem (for example, relevant information, prior health status, genetic endowment), and on what each microsystem does to (or with) that same patient (assessment, diagnosis, treatment, monitoring, and follow-up), as shown in Figure 1-6 (page 9).

- **Microsystems Are Linked, Tightly or Loosely, with Other Clinical Microsystems.** Collections of microsystems (for example, an emergency medical team squad, an emergency department, a catheterization lab, an inpatient unit for cardiac patients, a cardiology practice, a rehabilitation program) form mesosystems of care that serve patients with specific needs (for example, cardiac, obstetric, oncologic, or pediatric patients). Relationships within this greater
mesosystem, as within the microsystem units themselves, might be implicit or explicit, and here again specific functional processes, patterns of communication, and participant competencies determine the overall quality of care that is provided.

- **Microsystems Are Often Embedded in Larger Macrosystems.** Frontline clinical units are often components of larger health systems (that is, macrosystems) that share common oversight and administrative infrastructure, such as hospitals, group practices, or networks of health care facilities. The microsystem relies on this larger macrosystem to provide clinical and administrative supports that are essential to both patient care and business operations. Such support might include diagnostic testing, medical records management, transportation, pharmacy, billing, and informatics coordination. The large health system, in turn, depends on clinical Microsystems to deliver the “company product,” that is, to provide the right care in the right way at the right time, so that patients receive maximum achievable benefit through the most efficient use of available resources.

**Outcomes, Improvement, and Microsystems of Care**

How do the Clinical Value Compass, the Clinical Improvement Equation, and high-performing clinical Microsystems come together to optimize patient care in local contexts and to support the practice-based learning of health professionals? As suggested earlier, the final measures of quality are patient-oriented outcomes—not the “ideal” outcomes that inspire us in randomized, context-free, clinical trials (important as these are), but the real-world outcomes that are achieved by clinical Microsystems in particular health care settings, one patient at a time. The Clinical Value Compass brings clarity to a wide range of outcomes available for continuous improvement work, whereas the Clinical Improvement Equation maps specific skills and knowledge systems that a high-functioning microsystem must (collectively) master to meet those quality goals. Moreover, because Microsystems are themselves composed not only of health care providers but also the evolving information, interactions, and technical resources that connect and support these providers, such functional units of care become both the context and the substrate for practice-based learning and professional development. These relationships are depicted in Figure 1-7 (page 10) and Figure 1-8 (page 10).

Jim’s and Tony’s divergent health trajectories highlight several further improvement-related outcome characteristics:

- **Health Outcomes Evolve Over Time.** Each step in the delivery of care contributes not only to immediate outcomes but also to the trajectory and priority of subsequent outcomes. Jim’s and Tony’s clinical needs changed over time (from “saving my life” to “saving the quality of my life”), and so too did their perceptions of services directed toward meeting those needs. Clinical care and system improvement are not static events but dynamic processes that require flexibility and creativity from all participants.

- **There Are Multiple Types of Health Care Outcomes.** Quality can and should be assessed in multiple outcome domains simultaneously, and these domains (as defined by the Clinical Value Compass) affect one another continually. Jim’s satisfaction with

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**Figure 1-6. The Clinical Microsystems that Cared for Two AMI Patients on Their Health Care Journeys**

Figure 1-6. The clinical Microsystems that Jim Burke and Tony Lamont encountered are shown. *AMI, acute myocardial infarction; EMTs, emergency medical technicians; ED, emergency department; Cath Lab, coronary catheterization laboratory; CCU, coronary care unit; Cardiac Rehab, cardiac rehabilitation; Cardiac MD, cardiologist practice; PCP, primary care physician practice.*
**Figure 1-7.** Clinical Microsystems, the Improvement Equation, and Value Compass Outcomes in the Flow of a Health Care Delivery System*

Microsystems, which are themselves composed not only of health care providers but also the evolving information, interactions, and technical resources that connect and support these providers, become both the context and the substrate for practice-based learning and professional development.

* AMI, acute myocardial infarction; MS, microsystem.

**Figure 1-8.** Everyone Engaged in Relation to the Value Compass, Clinical Microsystems, and the Improvement Equation

The Clinical Value Compass, Clinical Microsystems, and the Clinical Improvement Equation all play a role in contributing to better patient outcomes, system performance, and professional development.
care depended on his functional status (including his ability to resume employment); Tony’s direct and indirect costs were related to optimization of biological markers of cardiac function. All these outcome domains are important and are likely to be prioritized differently at different times in the patient’s health care journey. As previously emphasized, each outcome also suggests specific targets for future improvement work. The exercises in Chapter 2 build on the idea of multiple improvement targets and invite the clinical team to re-envision their improvement work in the broadest possible terms.

• **Outcome Measurement Is Essential for Quality Improvement.** The well-intentioned clinical professionals at Tony’s hospital were unaccustomed to tracking process and outcome measures over time, and as a result they were simply unaware of their own suboptimal performance. As depicted in the Clinical Improvement Equation, the capacity to measure one’s own performance is an essential competency in the science and practice of quality improvement. Subsequent chapters (especially Chapters 4 and 7) argue that active use of quantitative self-assessment greatly empowers clinical microsystems to improve their own work in real time. In this context, professional development and practice-based learning need not be burdensome “extra tasks” that are squeezed into a busy day. Instead, the self-monitoring of selected performance variables builds development and learning into clinical care itself.

**Final Reflections on Clinical Improvement**

Motivated by his separate encounters with Jim Burke and Tony Lamont, Dr. Barr continued his own process of reflection in the days and weeks ahead. He recognized in subsequent explorations the extent to which value compass thinking, improvement-oriented knowledge systems, and microsystem organization had been actively embraced by the hospital where Jim (but not Tony) had received his initial cardiac care.

Dr. Barr came to three further conclusions, which we offer here:

• **Successful Improvement Comes from Actualizing the Clinical Improvement Equation in Each and Every Clinical Encounter.** High-functioning microsystems develop protocols and pathways to manage routine interventions with great efficiency, but quality “happens” one patient at a time. Consistent delivery of such quality requires both rigorous attention to the latest scientific evidence and specific adaptation to well-understood individual contexts. Available evidence, both general and contextual, must be integrated in real time, that is, during the swift daily flow of patient care, and in circumstances that are often ambiguous. The reflective clinician and the reflective clinical unit embrace these challenges as continuous learning opportunities.

• **Improvement Is Too Big a Job to Delegate.** Because quality, safety, and efficiency are determined continuously in each clinical encounter, the responsibility for maintaining quality belongs to every member of the health care organization. As we have previously asserted, the expectation in clinical settings must be that every participant has two jobs—to do the work and to improve the work. Such a mandate requires that all clinicians, nurses, and administrative personnel receive basic training in modern quality improvement methods, and that all staff be encouraged and expected to use these skills in daily work. Leaders of health care organizations must in turn develop a broad and deep improvement infrastructure (for example, frontline training, informatics, safety systems) to nurture the growth of this quality culture.

• **Quality Measurement and Transparency Will Profoundly Change the Work of Health Care Systems.** Increasingly, evidence-based metrics are monitored by employers, regulators, payers, and the public itself. Cardiac care performance data, for example, are published for most hospitals in the United States. Private insurers and now Medicare have begun to base reimbursement for chronic disease management on providers’ measurable compliance with evidence-based quality recommendations, and trends toward “value-based purchasing” of health services will certainly continue. As metrics for both quality and cost (the two components of “value”) grow more accurate, pervasive, and transparent, informed patients will selectively entrust their care — and informed purchasers will selectively channel their beneficiaries—to health care organizations that achieve the highest levels of demonstrable quality.

**Conclusion**

Several decades have passed since sociologist Robert Lynd implored his academic audience to ask of their own scholarly endeavors, “Knowledge for What?” Clinician-scientists of the twenty-first century must ask themselves this
same question. What are we trying to achieve in our frontline care of patients and populations, and what forms of knowledge, practice, and continuous learning are necessary to accomplish this goal?

In this first chapter we have developed a descriptive framework, a scaffolding of knowledge systems, that directs our collective attention to the challenges and opportunities of quality improvement in real-world practice settings. The Clinical Value Compass facilitates our understanding of patient-oriented outcomes, whereas the Clinical Improvement Equation reminds us that achievement of these outcomes depends on thoughtful adaptation of scientific evidence in locally defined contexts. This process of adaptation and implementation is the daily work of frontline clinical microsystems, which serve as both the supportive context and the substrate for practice-based learning and professional development. Success depends on both individual and collective competence in multiple domains of knowledge and skill.

Because several of these domains fall outside the usual training of clinicians, nurses, and health administrators, we are all on the steep slope of our learning curve. This is an exciting place to be, so long as we embrace our roles as continuous learners. In the chapters that follow, we begin our climb up this learning curve. Through specific exercises and case studies, we bring clinical improvement and practice-based learning into the daily work of patient care, with the goal of optimizing that care continuously in our own practice settings.

References
Practice-Based Learning and Improvement: *A Clinical Improvement Action Guide*, SECOND EDITION

Edited by noted quality improvement experts Eugene C. Nelson, D.Sc., M.P.H.; Paul B. Batalden, M.D.; and Joel S. Lazar, M.D., M.P.H., all at the Dartmouth-Hitchcock Medical Center and Dartmouth Medical School.

Because quality improvement is the work of everyone, this book was developed with several audiences in mind—clinicians, teachers and mentors of clinicians, participants of interdisciplinary work groups, improvement leaders, and leaders of health care programs and systems.

The book shows how to integrate practice-based learning, one of the core competencies for medical students and residents and for maintenance of specialty certification, into daily clinical work. As the book demonstrates, clinicians have two jobs: not just to do their work, but to improve their work.

This book features the following:

- Groundbreaking work in practice-based learning and improvement and clinical microsystems
- Case studies on leading health care organizations’ improvement work
- Advice on how to analyze an organization’s current care delivery processes and identify high-impact changes
- Strategies for planning and conducting rapid, sequential tests of change and measuring and demonstrating the results
- Worksheets for guiding clinical improvements for your patients
- Change ideas that masters of design and innovation use to invent better ways for doing the job

*This book is a path forward that offers some very good people—well-intentioned, highly motivated, deeply caring health professionals—a set of stepping stones. The stepping stones guide them on a journey toward mastering improvement as an everyday part of their professional practice.*

—Foreword by Donald Berwick, M.D., M.P.P., President and CEO, Institute for Healthcare Improvement

*This is an important book from authors who have been deeply engaged in the work of improving patient care.*

—Afterword by David Leach, M.D., Executive Director, Accreditation Council for Graduate Medical Education

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