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HARDWIRING Systems and Processes for Seamless Patient Care

FLOW



Thom Mayer, MD, FACEP, FAAP
and Kirk Jensen, MD, MBA, FACEP

The following pages are excerpted from
the book titled

HARDWIRING FLOW

**Systems and Processes for
Seamless Patient Care**

**by Thom Mayer, MD, FACEP, FAAP
and Kirk Jensen, MD, MBA, FACEP**

It is provided as a sample of the book's content in order to give
the reader a sense of what the actual book is like.

HARDWIRING Systems and Processes for Seamless Patient Care

FLOW

“I coined a term a few years ago, rather awkward but to the point: ‘gaspworthy’—as in, obviously, the audacity and power of the proposed program make you no less than gasp. Well, this is clearly a ‘gaspworthy’ effort. The healthcare debate is complex, but I have long believed that the true breakthroughs in healthcare will come, not primarily from external policy overhauls, but from the likes of superior application of programs such as ‘flow’ described herein. The big point: The approach laid out here is within the grasp of any hospital; it requires no alteration of outside forces. Hence, in my view, not to follow a path like this is a breach of duty to our patients as much as an inappropriate treatment protocol. Read it. Absorb it. Act. No excuses. Yes, ‘gaspworthy.’”

—Tom Peters, **One of the most influential business thinkers of all time,**
Author of Reimagine: Business Excellence in a Disruptive Age
and In Search of Excellence

“A highly original and unexpected application inspired by the flow theory of optimal experience to the problem of managing patient flow in treatment centers. This book will be very helpful to anyone who is concerned to make sure that waiting for services will be minimal, and as enjoyable as possible—a huge boon in these days when wasting time is worse than wasting money.”

—Mihaly Csikszentmihalyi,
Professor of Psychology and Management,
Claremont Graduate University, Claremont, CA

“Improving patient flow is one of the most confounding challenges in the healthcare system. Yet, when we get it right, the rewards—in terms of patient and staff satisfaction, patient safety, reduced waste, and improved financial status—are enormous. This book is a tremendous resource, chock-full of ideas, tools, and examples that will enable the reader to hardwire better flow solutions into their system.”

—Carol Haraden, PhD,
Vice President, Institute for Healthcare Improvement

*“As the CEO of a national financial firm, I have witnessed firsthand the power of process excellence, which is essential to creating a competitive advantage in business. In **Hardwiring Flow**, Dr. Mayer and Dr. Jensen advocate an innovative and transformational way to liberate healthcare by systematically focusing on where value is created and eliminating the waste that stands in the way of quality patient experiences and outcomes. Rarely is there a silver bullet to address the inevitable challenges that plague any complex system—whether in business or healthcare—but the process methodology described in **Hardwiring Flow** may be as close as it comes. Great process enhances the ability to deliver exceptional medical care working backwards from patient needs and, as a byproduct, is more efficient and cost effective. This book is essential reading given the current challenges facing the healthcare system.”*

—Richard D. Fairbank,
Chairman and CEO, Capital One

*“**Hardwiring Flow** is a timely book for healthcare leaders who must face, simultaneously, an ever-decreasing workforce and an ever-increasing workload. Drs. Mayer and Jensen combine a profound intellectual understanding of the dynamics of the processes by which we provide care with a practical approach to doing our work better. I was especially drawn to their elegant ‘six clinical elements’ approach: the right resources to the right patient in the right environment for the right reason with the right team at the right time. Pragmatic, actionable, and filled with clarifying examples, this book will surely empower readers to create change inside their own organizations.”*

—Jay Kaplan, MD, FACEP

“A wise, practical, and highly original discussion of patient flow and how to improve it. Readers will see the connection between flow improvement and value creation in a new light.”

—Leonard L. Berry, PhD,
Distinguished Professor of Marketing, Texas A&M University,
Coauthor of *Management Lessons from Mayo Clinic*

“Hardwiring Flow was an unexpected page-turner, full of instructional insights to the world of emergency physicians and their patients. Visionary in scope and innovative in application, Mayer and Jensen have produced a work that will change medicine as we know it.”

—Angela F. Gardner, MD, FACEP,
President, American College of Emergency Physicians

*“To the extent timing is important, Thom Mayer and Kirk Jensen have hit on the right topic at the right time in their recent book, **Hardwiring Flow**. The entire healthcare industry is focused on cost, and their work on flow and systems does a terrific job of introducing the science, math, and art of flow management. As we are all grappling for new tools, this book is a welcome tool kit.”*

—Bruce Crowther, FACHE,
CEO, Northwest Community Hospital, Arlington Heights, IL

“Hardwiring Flow is a tactical and comprehensive how-to approach to solving the most challenging of healthcare problems. This book not only provides detailed solutions to flow issues, but provides an easy-to-understand and readable review of critical physician and staff issues that make or break a system’s ability to provide effective and efficient care. I found this book extraordinarily helpful and relevant to the black hole of patient flow.”

—Stephen Beeson, MD
Author of *Engaging Physicians and Practicing Excellence*

*“Waits and delays do not have to be a routine part of patient care. In **Hardwiring Flow**, Dr. Mayer and Dr. Jensen expertly present proven theories and strategies to guide improvements in hospital-wide patient flow. The authors’ practical approach makes the theories and strategies readily implementable. I highly recommend the study of this book to anyone who has the good fortune to work in a hospital. The potential impact on patient and staff satisfaction, safety, and the bottom line is enormous.”*

—Kevin Nolan, MA,
Statistician, Associates in Process Improvement

HARDWIRING

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Processes
for Seamless
Patient Care

FLOW

**Thom Mayer, MD, FACEP, FAAP
and Kirk Jensen, MD, MBA, FACEP**

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To my wonderful wife and best friend, Karen; to my sons, Christopher and Michael, for their inquisitiveness and zest for life; and to my parents, Earl and Naomi, for “hardwiring” my values.

—Kirk Jensen, MD, MBA

To my beautiful, brilliant, and always inspiring wife, Maureen.

To our three sons, Greg Mayer,

2nd Lt. Kevin Mayer, United States Marine Corps,

and Josh Mayer.

To Josh’s wife, Valerie, and their daughter, Eve.

To the memory of my parents, affectionately known as

Grandpa Jim and Grandma Bette.

And to the memory of my father-in-law, John Bernard Henry, MD,

who was a scientist, author, and man of epic measure.

—Thom Mayer, MD

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FOREWORD

In our work with hundreds of organizations, we've found that even if you get the people component right in healthcare—the right person at the right place—it still doesn't ensure success. We're in an industry where everything has to be working well—from the equipment to the technology to the facilities to the systems. Nothing is more frustrating than working so hard to get the people component right but still not achieving the desired outcomes. This leads to losing the people component due to the staff's own frustration with how the systems work and discouragement that they are working so hard and not accomplishing what their calling is, to take great care of patients.

Dr. Thom Mayer and Dr. Kirk Jensen have always been impact players in healthcare. Dr. Thom Mayer is the chairman of the board of BestPractices, Inc., and a medical director for Studer Group.[®] He has been widely recognized as one of the nation's foremost experts in leadership, management, customer service, and flow in healthcare. He is also recognized as an expert in emergency medicine, pediatric emergency medicine, trauma, and sports medicine. Dr. Kirk B. Jensen has spent over 20 years in emergency medicine management and clinical care. Board-certified in emergency medicine, he has been medical director for several Emergency Departments and is chief medical officer for BestPractices and a medical director for Studer Group.

Both Dr. Mayer and Dr. Jensen have practical experience; they have done it and are still on the field. They take the thinking to the doing, which leads to becoming. In healthcare, we spend *a lot* of time thinking, but Dr. Mayer and Dr. Jensen help us move to doing. It is by doing that we get the outcomes and by doing consistently that we accomplish our goal—we become great places for patients to get care, employees to work, and physicians to practice medicine.

Dr. Mayer's and Dr. Jensen's commitment to excellence in achievement and unwillingness to accept the status quo makes healthcare better for all. As a reader of this book, you will have the processes, tactics, and techniques to achieve and maintain excellence.

Sincerely,
Quint Studer

ACKNOWLEDGMENTS

This book is the product of our combined efforts on this subject accumulated over a total of 25 years of clinical practice and working with, learning from, and mentoring hospital teams across the country, while also applying these principles in the hospitals and healthcare systems with which we work on a daily basis. Therefore, it is very much born from the combined efforts of a large number of health professionals whose hard work and insights have contributed to our current understanding of flow and its dramatic impact on the lives of our patients and those who care so courageously for those patients.

At BestPractices, Inc., we wish to thank the members of the Physician Leadership Team, including Doctors Robert Cates, Glenn Druckenbrod, Luis Eljaiek, Jr., Rick Place, John Howell, Dan Hanfling, Raul Armengol, Damian Banaszak, Scott Weir, John Maguire, Hannah Grausz, Maybelle Kou, Mary Ann McLaurin, David Postelnek, Michael Born, Vince Sevier, Anthony Kitchen, Wayne Cayton, Gary Senula, and Gary Fraley. We also want to thank our entire Senior Leadership Team, including Eric Minkove, Andrea Bondi, Dan Kirkpatrick, and the incomparable Kaye Wear, whose tireless work over 30 years has improved the lives of both patients and physicians. Joy Sparks-Gavira was, as usual, a joy to work with and was critical to the timely submission of the manuscript. Ashley Jones and Alice Lingerfelt also made major contributions to the work. Robert Milks was of great help in producing and editing the manuscript.

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At Studer Group, Quint Studer has been a mentor and source of unparalleled inspiration, and we are deeply grateful for his friendship and the faith he has put in our work. BG Porter has also had a major impact on our work and the book reflects his impact as well. About Jay Kaplan, MD, there are not enough words to express our deep respect and gratitude for the countless insights we have gained in listening to his lectures over the years. Our colleague Stephen Beeson, MD, has greatly expanded our view of leading physicians and we are grateful for his insight. Finally, after publishing over 15 books between us, no editor has ever been as efficient, pleasant, insightful, and wise as Bekki Kennedy. The book would not have seen the light of day without her Herculean efforts.

We'd also like to thank the entire team at DeHart & Company Public Relations for their proofreading and design services—as well as handling many of the million-and-one unforeseen details that crop up when bringing a project like this to fruition.

Many individuals and organizations have contributed to our evolving knowledge of how to improve patient flow. Studer Group, with its vast body of work in the arena of Evidence Based Leadership, is one of them. The firm's insights on aligning employee behaviors and processes as well as getting physicians engaged have been invaluable. In addition, we would like to recognize the central role played by the Institute for Healthcare Improvement (IHI) in advancing this science. Much of the material in this book was developed as part of work in IHI programs and with IHI staff and faculty members. We gratefully acknowledge the leadership of both of these organizations in this area.

Many people with diverse backgrounds and viewpoints have helped guide our thoughts on flow, management, and leadership over the years, including Tom Peters, Peter Block, Peter Senge, Rob Strauss, MD, Mel Gottlieb, Will Galtney, Mihaly Csikszentmihalyi, Len Berry, Don Berwick, MD, Kevin Nolan, Roger Resar, MD, Deb Kaczynski, Marilyn Rudolph, Jody Crane, MD, MBA, Chuck Noon, PhD, and Eugene Litvak.

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Many thanks to our families for their patience and understanding with our long dedication to this book, the underlying intellectual content underpinning it, and the many long hours we were away from home speaking at meetings and working with hospitals and healthcare systems to make flow a reality. In particular, our wives, Karen Jensen and Maureen Mayer, were, in every sense of the word, full collaborators in the genesis of the work, and if there is any wisdom herein, it comes in no small measure from them. Any failures or errors of omission or commission are entirely ours.

We encourage the readers of this book to contact us if we can be of assistance in any way.

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CHAPTER 1

DEFINING FLOW: THE FOUNDATIONS OF FLOW

*“When I use a word,” Humpty Dumpty said, in rather a scornful tone,
“It means just what I choose it to mean—neither more nor less.”*

*“The question is,” said Alice, “Whether you **can** make words mean so
many different things.”*

“The question is,” said Humpty Dumpty, “which is to be master—that’s all.”

—Lewis Carroll, *Through the Looking Glass*

After a combined half-century study of the concept of flow, we have come to at least one ironclad conclusion: *Words matter!* By this we mean that, properly used, words communicate some combination of data, knowledge, or wisdom, which, taken together, help guide our efforts and those for whom we are responsible as healthcare leaders. Specifically, it is essential that we use our words with precision, so that there will be clarity with regard to what is meant, what needs to be done, when it needs to be done, and, whenever appropriate, how it needs to be done.

Into this mindset comes the increasingly important concept of the flow of patients through our hospitals and healthcare systems. (Throughout this book we use the term *flow* to refer to “patient flow” unless otherwise specifically noted.) With the importance of the precision of words and the weight they carry in mind, we enter into somewhat perilous waters when it comes to defining flow. On the one hand, it is a widely used and commonly understood term. Yet on the other hand, it is a term that has been poorly and inconsistently defined. We ourselves have defined flow in previous works, though, as we will see, we believe that previous definitions of flow are not as helpful as our current thinking is on this subject. Or, as former United States Supreme Court Judge Potter Stewart noted about another subject:

I may not be able to define it, but I know what it is when I see it.

Many people say the same about flow, with perhaps the important modification that, “I may not be able to define flow, but I know both when it is there—and when it isn’t!” More to the point, our patients know when flow is there—and when it isn’t. The term *flow* is used almost with an inherent assumption that we understand its meaning, even if it hasn’t been precisely defined.

With this caveat in mind, we begin this chapter with a brief review of the origins of flow, including the seminal work of Mihaly Csikszentmihalyi (1990, 1993, 1996, 1997) as well as the thoughts others (including ourselves) have had with regard to defining flow in healthcare. We then present what we see as the most valuable and pragmatic definition of flow, including examples of its application in practical settings. Finally, we briefly introduce the Flow Toolkit™, the elements of which are discussed in greater detail in the following chapter.

FLOW’S ORIGINS: MIHALY CSIKSZENTMIHALYI AND THE EXPERIENCE SAMPLING METHOD (ESM)

Mihaly Csikszentmihalyi, a brilliant psychologist then working at the University of Chicago, began studies in the mid-1970s designed to identify the root sources of happiness in individuals from varying educational,

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financial, and societal backgrounds. By utilizing pagers programmed to signal the subjects at different times of the day, Csikszentmihalyi then had his subjects record their mental status, their state of happiness, their state of frustration, and other pertinent information in what he described (1990) as the experience sampling method (ESM). In distilling and analyzing these data, Csikszentmihalyi noted that he identified a phenomenon he referred to as “flow,” describing a new “psychology of optimal experience.”

Csikszentmihalyi identified eight factors comprising the flow experience (1990):

1. Goals have clarity.
2. Feedback is immediate and clear.
3. Challenges are evenly matched with skills required.
4. A feeling of intense focus develops.
5. You escape “inward and forward”—the periphery recedes.
6. You are in control—but “on the edge.”
7. Self-consciousness disappears—but returns even stronger.
8. The sense of time seems transformed.

These fundamental elements constitute the basis of flow as described in his original research. Csikszentmihalyi acknowledged his study of Maslow’s concept of self-actualization and creativity in his work, but clearly expanded its horizons through the ESM method and the conclusions to which it led. Of some interest, Csikszentmihalyi listed several examples from healthcare in his original 1990 description of flow, including the feeling that highly trained surgeons have in the course of performing challenging, yet achievable, surgical procedures requiring great skill.

The eight characteristics describe the elements noted during the experience of flow. Because flow is a positive phenomenon, it is therefore one those who have experienced it seek to repeat. This observation led to the insight that those who are able to replicate flow experiences have what Csikszentmihalyi (1996) called complex personalities, which he describes as comprising five fundamental characteristics known as “The 5 Cs.”

1. **Clarity.** Those with complex personalities have a deep ability to retain a clear and intense realization, both as a whole and moment to moment, of their goals, real-time feedback concerning those goals, and the ability to read that feedback immediately as to their progress—or lack thereof—toward attainment of the aim.

2. **Center.** The ability to center, focus, distinguish feedback from distraction, and fuel feedback while extinguishing distraction is a key feature of complexity in pursuit of flow.
3. **Choice.** Of all the possible choices of action to be taken, which among them proceeds to flow? Complexity involves a continuous (if tacit) dialogue asking, “Why?” and “Why not?” The choice to accentuate flow experiences arises out of this dynamic tension.
4. **Commit.** Attaining flow consistently occurs for those who can not only follow clear, centered actions that have been chosen but also have the ability to care for and commit to the course of action. They never “go through the motions,” but are instead deeply invested in the outcome.
5. **Challenge.** The final characteristic of complexity is a seemingly innate ability to constantly “up the ante” in seeking further challenges and levels of attainment of more advanced goals over time. Having gotten to one level by meeting or exceeding difficult challenges, those with complex personalities then “reset the thermostat” to the next level and the next set of challenges. Or, as the saying goes: “There is no finish line—the victory is in the running!”

These five elements comprise the bedrock aspects of the experiences of those who have attained flow and seek to continuously repeat the experience by expanding the horizons of flow. Flow and complexity are thus intimately related in that flow is described by the eight characteristics *that occur in the flow experience itself*, while the “5 Cs” describe the elements observed in those with complex personalities *who seek to replicate flow experiences on an ongoing basis*. As we reflect on our experiences with flow in healthcare, Csikszentmihalyi’s taxonomy of flow and complexity describes what we have seen accurately and precisely. However, we have felt that more work needed to be done to answer the question “How can we apply this to the phenomenon of flow in healthcare?” And even more importantly, “How can we best define flow in healthcare systems and processes?”

While the book *Flow: The Psychology of Optimal Experience* (1990) has been justifiably honored and popular, there was very little initial application of the flow concept to healthcare. Of particular interest is the following insight (1990):

Flow cannot be pursued. It must ensue.

Csikszentmihalyi meant that to apply to the experience of flow for the individual experiencing flow. For healthcare leaders, the challenge is clearly to prove that insight wrong with regard to creating flow in the healthcare system. In other words, we must find ways to assure that we can develop a practical and pragmatic definition of flow that allows us to illuminate the pathway toward flow for other healthcare leaders, who must be trained to create the optimal conditions in which flow can ensue.

THE ORIGINS OF FLOW IN HEALTHCARE

As the precepts and principles of industrial models of improving quality (including continuous quality improvement, total quality management, and other models) began to be applied to healthcare in the 1970s and 1980s, one area of particular emphasis was the concept of *variation* and its effect on the ability to consistently deliver quality care. An emerging sense developed that reducing this variation, particularly through the redesign of processes, could have a substantial impact on the fundamental way in which healthcare was delivered. The 2003 white paper published by the Institute for Healthcare Improvement (IHI) “Optimizing Patient Flow: Moving Patients Smoothly Through Acute Care Settings” stated the problem succinctly:

Patients and providers alike regard waits, delays, and cancellations as a normal part of getting and giving care. Particularly in hospitals, waiting seems intrinsic and, to many, intractable.

In many ways, the fundamental problem is helping leaders understand that poor flow may be intrinsic to many of our systems, but our challenge is to prove not only that it is not intractable but that specific tools exist to dramatically improve flow. Without ever specifically defining “flow,” the white paper did begin to discuss the intersection of three vectors as possible components in understanding flow:

1. variation;
2. waits and delays; and
3. a fundamental mismatch between demand and capacity.

To our knowledge, this was the first publication specifically addressing flow in the patient care setting, and its primary emphasis was on reducing process variation. It also reiterated an insight (Covey 2004) originally made by Arthur W. Jones, a knowledge-management specialist at Xerox's famous Palo Alto Research Center (PARC), and later popularized by Dr. Donald Berwick (1996) as the first law of improvement:

Every system is perfectly designed to achieve the results it achieves.

Partially as a result of working closely with IHI in its development of the concept of patient flow and partially through independent interest and research, we developed an alternate, somewhat more nuanced definition of flow, which we published previously (Jensen et al. 2007). Our view then was that flow comprised five essential features, which we delineated there.

1. flow as efficiency and cycle times;
2. flow as reduced variation, increased predictability, and improved forecasting;
3. flow as systems thinking;
4. flow as empowered providers exceeding expectations; and
5. flow as demand-capacity management.

Flow as Efficiency and Cycle Times

While flow could simply be defined as turnaround time (TAT), our view has been that turnaround time *alone* is insufficient to define flow. In general, people tend to believe that “faster is better,” but in healthcare we have seen cycle times alone as insufficient for effective flow. In healthcare, we need to learn and live by the adage:

We must be fast at fast things and slow at slow things.

For example, in the Emergency Department, in general, the faster we can evaluate a sprained ankle and treat it, the better. If we can speed the process of obtaining a radiograph of the ankle and put the patient and provider together faster, the better it is for the patient and the provider. (Indeed, using evidence-based approaches such as the Ottawa Ankle Rules [Bachmann et al. 2003], radiographs in certain cases can be safely eliminated altogether.)

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However, for patients with moderate to severe but nonspecific abdominal pain, a certain amount of time is necessary to take a history, examine the patient, establish intravenous access, perform appropriate laboratory and imaging studies, and determine the patient's course and response to treatment over time. For the abdominal pain patient, how fast is too fast and how long is too long? By way of extreme example, 20 minutes is probably too fast (unless a critical abdominal crisis requiring immediate surgery is present), and 12 hours is undoubtedly too slow. However, if the patient has clear-cut appendicitis, confirmed by history and physical examination, is it really necessary to confirm the diagnosis with imaging studies when it is apparent from history and physical examination? There are countless other examples to help demonstrate that, while turnaround times and efficiency and effectiveness are an important component of flow, they are insufficient and inadequate to solely define flow.

Flow as Reduced Variation, Increased Predictability, and Improved Forecasting

While we believe that IHI's original insight about reducing variation as one of the keys to improving flow is valid, we do not think reducing variation alone will attain flow. To be sure, the tools of statistical process control, statistical analysis, and focusing deeply on variation are all important to improving flow. However, as we will see, reducing variation is less important than *reducing variation that does not add value*. More on this concept later, but we also believe the reduction of variation must be supplemented by an ability to increase predictability so we can forecast the demands that will be placed on healthcare.

By way of an extremely simple example, there is an old saying that, "You can't predict what's coming to the Emergency Department!" While on its surface this saying makes some sense, in fact if statistical analysis is applied to the ED, we not only know how many people are coming but also what types of illness and injuries they will have by time of day, day of the week, and season of the year. For example, we often tell our ED patients:

"I knew you were coming—I just didn't know your name!"

Thus, while there are some surprises in the ED, there is also a high level of predictability regarding the healthcare we provide. To the extent that we are able to forecast patient demand, we increase our ability to improve flow.

Flow as Systems Thinking

In many respects, flow is a complex interaction between multiple systems, all of which are designed to improve the health and safety of the patient. Healthcare involves a series of service transitions in a complex fabric of various providers weaving their efforts into a systematic effort on even the simplest initiatives. Doctors, nurses, laboratory workers, radiologists, radiology technicians, and a vast array of other healthcare workers interact to varying degrees in the care of a given patient in the healthcare system. If these processes—and the people who provide those processes—are not positively and proactively cooperating to develop a seamless system, in fact, the provision of our healthcare begins to appear to the patient and the family as having been “functionally siloed,” in that service handoffs and transitions are not effectively handled. To most effectively assure that this coordination occurs, we must align strategic incentives across the various aspects of healthcare in a systems approach. For more on the importance of a systems approach to healthcare, see Peter Senge (2006), Tom Peters (2003), John Kotter (1996), Quint Studer (2008), and Peter Block (Block 2002).

Flow as Empowered Providers Exceeding Expectations

While we want to reduce variation to help improve patient flow, we also want to make sure that our healthcare providers are well educated and well trained, and that they are *empowered* to exceed expectations whenever possible. Empowerment simply means that those providing the service have the ability to adapt the service to meet or exceed the needs of the patient or family during the course of the provision of that service. A simple way of illustrating this is by asking this question:

Do you have a thick-rulebook company—or do you have a thin-rulebook company?

In other words, if the rulebook is so thick that the provider has to “look up” the right way to deliver the service, it is highly unlikely that that service will be pleasing to either the patient or to the person providing care to the

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patient. However, if your company has a commitment to well-thought-out values, principles, and strategies—including the core value of reducing variation—and then empowers the employee or groups of employees to provide the service according to those values, principles, and strategies, that is a “thin-rulebook company” and a very pleasing one to both those providing the service and the patients who receive superior service from those employees. In addition, understanding a patient’s expectations and meeting—or exceeding—they is critically important to improving flow. As we’ll discuss later, the simplest way to understand patients’ expectations is two simple words: *Ask them!* The clearer we can be with regard to what the expectations are, the more likely we are to be able to meet or exceed them. To a certain degree, flow exists to the extent that we are able to not only understand expectations but exceed them.

Flow as Demand-Capacity Management

As we will discuss in more detail, service capacity simply cannot be stored and is in that respect a perishable commodity. The more a system has bottlenecks or rate-limiting steps built into it, the less it has flow as an essential characteristic. Matching service demand with service capacity is a critical component of flow and requires a number of tools, strategies, and interventions, which, thankfully, are becoming increasingly well honed and understood.

Evolving a More Practical Definition

While the preceding definition of flow is perhaps more comprehensive than previous iterations, we have come to view it as more cumbersome and less possessed of utility. The principles making up flow in this definition all have proven their validity since the definition was proposed; still, we believe it is necessary to evolve it to a much more succinct and practical definition. Part of that definition is an understanding of flow as “the movement of patients through the network of queues and service transitions that characterize modern healthcare” (Jensen and Crane 2008). But what is it *about* that movement that speaks to flow existing or not existing, being improved or declining? These questions led to our current focus on defining flow as the process of adding value and eliminating waste during the course of our patients’ journey through the healthcare system.

DEFINING FLOW AS VALUE ADDED AND WASTE ELIMINATED: THE BENEFIT-TO-BURDEN RATIO

With the above thoughts in mind, we took a deeper dive into a definition of flow that affords a more practical means of identifying, training for, and accentuating flow. Fundamentally, it is an attempt to find ways in which flow *can* be pursued and not just ensue.

In some respects, the genesis of the concept of flow grew out of an increasing focus on applying leadership and management principles to healthcare. To be sure, applying these leadership and management principles was an extremely important trend. Out of that movement and the literature supporting it has come a truism with origins in the well recognized and widely respected works of Joseph Juran (1989), W. Edwards Deming (1986), and William Shewhart (1939), among others, which is:

Quality exists to the extent that value is added to a product or service.

This concept is precise, concise, and widely accepted. In our experience, though, it is not of particular utility in guiding which of many clinical options we should pursue, much less how we might measure value and therefore quality. Further, how is the nurse or doctor at the bedside able to put this definition to use for the good of the patient? Thus, while the statement on its face seems true and has what the statisticians would call “face validity,” it has little practical applicability unless we can define the term *value*.

With these thoughts in mind, we recalled the insights learned from one of America’s preeminent researchers on service excellence, Dr. Leonard Berry from Texas A&M University, who has described the importance of analyzing the benefits and burdens inherent in the delivery of a product or service (Berry 1995, 1999; Berry and Seltman 2008). Berry notes that value comprises a simple ratio of benefits received versus burdens endured to receive those benefits. In considering the complexity of flow through the healthcare system—and in particular the importance of system appreciation—we have come to appreciate the validity and utility of the following definition:

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Flow exists to the extent that value is added to a product or service during a patient's journey through the queues and service transitions in healthcare.

In other words, at each step of the patient's journey through the healthcare system, those providing the care should ask the following questions:

Does this add value?

How does this add value?

To the extent that the process or service adds value, flow has increased. If it has not added value, flow is, at best, neutral. And if it has subtracted value, flow has decreased.

The next question becomes how we define the terms *value* or *value added*. Here is where the brilliance of Leonard Berry's formulation appears (1999).

Value is defined as a ratio of the benefits received versus the burdens endured as the service is delivered.

Graphically, this formulation looks like this:

$$\text{Flow} = \text{Value Added Services} = \frac{\text{Benefits Received}}{\text{Burdens Endured}}$$

Thus, if you want to increase flow in the system, you need to increase value by addressing the benefit-to-burden ratio. By this definition, anything that increases benefit increases value and therefore flow, so long as the burdens involved in increasing the benefit do not increase more than the benefit itself (but more on this later). A very simple example is the routine use of standing physician orders to proactively manage pain in certain groups of patients by the use of oral pain medication. This effort increases benefit by alleviating pain in a more timely fashion. But what if the pain medication has to be given intramuscularly (IM) or intravenously (IV)? In this case, both the numerator (the benefit of relieving pain) and the denominator (the burden endured from

a shot or an IV) change as well. Presumably, the discomfort of the shot or establishing an IV is a burden exceeded by the benefit of the pain relief provided by the more rapid and, in some cases, more powerful agent being given by the IM or IV route. To the extent that the benefit (pain relief) exceeds the burden (the discomfort of the shot or IV), value has been added and therefore flow has improved. This example also shows that, just as there is a flow equation of a value-added-benefit-to-burden ratio for the patient, there is also one for the nurse who provides the care. Specifically, the presence of the standing order for pain medication in certain groups of patients precludes the nurse having to call the doctor, wait for the return call, get a medication order, prepare the medication, and finally give the patient the medication—all of which are burdens for a busy nurse who is often overtaxed in the first place. By eliminating or decreasing these burdens, a hospital adds value and improves flow for the nurse as well as for the patient.

The benefit-to-burden ratio as a definition of flow through adding value can be applied to virtually any process or activity in healthcare by asking three fundamental flow questions:

1. What are the benefits received?
2. What are the burdens endured?
3. Would you tolerate this ratio?

The last question is perhaps the most important, at least for any organization that professes to put the patient first. If it isn't good enough for you or, more importantly, a member of your family, why is it good enough for your patients?

We can add a further subset of questions to each question. For the benefits, are they obvious? If so, you should reaffirm them, to assure that the patient and family realize them. If they are not obvious, you should inform patients about them by using scripts or Key Words at Key Times™. (See Chapter 3.) Here's a simple example involving privacy, an important aspect of the patient's perception not only of the courtesy of the healthcare experience but of flow as well. Closing the curtain or door to the room is a way of assuring the patient's privacy. But this can be a non-obvious benefit, and we can use these key words to make it more obvious:

“Mr. Rodriguez, shall I close this curtain *for your privacy?*”

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By using these words, we can not only make the benefit more obvious but also give the patient a choice in the matter. Sometimes the results can surprise you, as we learned one night from an ED patient with whom we had used the above script. His response was classic:

“No, thanks. I’d rather enjoy the show!”

We learned from him that we are always “onstage” in healthcare and are providing “The Show” to the patient. (We discuss the “onstage” concept further in Chapter 3.)

With regard to the burdens endured, are they necessary or unnecessary? If they are necessary, explain why they are necessary at each step of the way, and the patients’ flow experiences will improve. If they are unnecessary, eliminate them! Figure 1.1 illustrates the concept of flow as value added and the questions we need to ask as we improve flow in healthcare.

Figure 1.1: The Benefit-to-Burden Ratio Defining Flow in Healthcare and Steps to Accentuate Benefits and Eliminate Unnecessary Burdens

• What are the BENEFITS RECEIVED?

Obvious? - Re-affirm them
Non-obvious? - Inform them

• What are the BURDENS ENDURED?

Necessary? - Explain them
Unnecessary? - Eliminate them

WOULD YOU TOLERATE THIS RATIO?

The calculus of the benefit-to-burden ratio results in a sometimes dizzying number of combinations in which value can be increased and flow can be improved through working on both the numerator (benefits) and the denominator (burdens). As Figure 1.2 illustrates, there are almost infinite possible pathways to increase value; we just need to explore them.

Figure 1.2: Mechanisms to Increase, Decrease, or Keep Static Variables of Benefits and Burdens and Increase or Decrease Value

The Calculus of Flow

Changing the Benefit to Burden Ratio

Increased Value

↑ Benefit, → Burden
 ↑↑ Benefit, ↑ Burden
 → Benefit, ↓ Burden
 ↑ Benefit, ↓↓ Burden

Decreased Value

→ Benefit, ↑ Burden
 ↑ Benefit, ↑↑ Burden
 ↓ Benefit, → Burden

↑ Increase, ↓ Decrease, → Same

A helpful tool in this task is value-stream mapping (Nash and Poling 2008; Lee and Snyder) or VSM; it offers a highly visual method of describing processes, services, and systems in a way that accentuates the specific actions and places that increase value. We describe it in more detail in Chapter 3. Understanding queues (and the elimination of non-value added queues) and service transitions is also critical to finding ways in which to increase flow through increasing benefits and decreasing burdens. Finally, both evidence-based medicine and Evidence-Based LeadershipSM are of great importance because they help leaders standardize the approach to the healthcare we provide. As we noted and will discuss further, reducing variation that does not add value is a key part of improving flow.



A Word About Evidence-Based Leadership

To understand flow, it helps to first understand Evidence-Based Leadership. Indeed, the principle of flow is a powerful example of EBL in practice.

What *is* EBL? Basically, it's a strategy centered on using behaviors and tactics collected from around the country that have been proven to yield the best possible outcomes. Organizations that embrace EBL standardize these "best practices" and hardwire them into their systems and processes so that they remain in place as leaders come and go.

Just as the American healthcare industry uses evidence-based medicine (EBM) to guide clinical decisions, its leaders should be committed to Evidence-Based Leadership (EBL) in order to create sustainable results.

There are three fundamental components to EBL:

1. aligned goals;
2. aligned behavior; and
3. aligned processes.

It's the very presence of this alignment that allows the principles we discuss in this book to take root and flourish inside an organization. At least from the patient's perspective, every staff member who provides care is exercising leadership. When everyone is working together, using standardized practices, flow can ensue.

To learn more about Evidence-Based Leadership and its connection to hardwiring flow, please visit www.studergroup.com/hardwiringflow. There, you'll find a downloadable PDF that explains how healthcare organizations use EBL to create consistently great outcomes for employees, physicians, and, of course, patients.

FLOW AND THE CONCEPTS OF VALUE ADDED AND NON-VALUE ADDED (WASTE)

A corollary of the definition of flow as the connection of activities adding value to the patient's healthcare experience is that we can classify our processes, using the benefit-to-burden ratio, as value added or non-value added. As our previous discussion implies, if the benefit-to-burden ratio increases, we have added value. If it decreases, value has decreased, and the change should properly be considered non-value added. But a much better term for non-value added is the more precise description of what such activity provides the healthcare system—*waste!* Anything that doesn't add value is not just the *absence* of value, it is the *diversion* of resources from the value stream. Further, because our resources—and the time and energy of those who lead and manage those resources—are severely capacity-constrained, waste is also the *destruction of possibility*, since it consumes time, effort, and energy that could otherwise create value and improve flow elsewhere. As Taiichi Ohno noted, "Waste is any expenditure of time, money, or other resources that doesn't add value" (Black and Miller 2008).

A simple question arises about waste, which is: Is waste the presence of something negative or the absence of something positive? In fact, waste encompasses elements of both, to varying degrees. Figure 1.3 lists the seven types of waste as defined by Ohno in his original work.

Figure 1.3: The Seven Types of Waste That Must Be Eliminated

1. Waiting
2. Transportation
3. Processing
4. Inventory
5. Movement
6. Defective products or services
7. Overproduction

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We should thus learn to distinguish burdens from waste. Burdens are the necessary parts of the current processes constituting the flow experience. They may not be pleasant, but they add value to the process or service. For example, anyone who has ever had to drink oral contrast prior to an abdominal CT scan will tell you that it is a burden—it doesn't taste great and it takes time to circulate through the GI tract before imaging can begin. But it is, at least in the correct circumstances, a burden that adds value in that it allows the radiologist to better delineate the intra-abdominal organs. Another example of a necessary burden is the need to obtain access to the femoral vessels in a cardiac catheterization. It is uncomfortable, carries the risk of bleeding, and requires various means of hemostasis following the procedure, but it is a burden that must be endured to permit the procedure. (To be sure, considering the benefit-to-burden ratio has led us to introduce certain ways of lowering the pain or discomfort burden, including topical anesthesia or the use of amnestic agents such as Versed®.)

To return to the example of oral contrast in abdominal CT scans, many hospitals have progressive radiologists who have studied the issue and the medical literature and have determined that oral contrast is not necessary in routine abdominal CT scans, except in certain circumstances. Based on collaborative efforts between radiology and the clinicians ordering the studies, they have *eliminated waste by eliminating the burden* of the oral contrast. This action adds value and improves flow, in this case for the patient, the nurse, and the ordering physician. As we'll see in the next chapter, the use of oral contrast is a rate-limiting step or bottleneck, so the elimination of waste creates further value and flow by eliminating the time required to drink the contrast and allow it to circulate. *This creates capacity in a severely capacity-constrained system.*

For example, an Emergency Department that had an annual volume of 95,000 patient visits found through retrospective review that it completed 20,500 abdominal CTs per year, each of which, by policy, required the administration of oral contrast. Again, retrospective chart review indicated that the use of oral contrast added, on average, 155 minutes to a patient's length of stay in the ED. (Note that the very process of studying the rate of utilization is an example of increasing the predictability of the study, a key step in improving flow.) A collaborative effort of the departments of Radiology, Emergency Medicine, and Surgery resulted in the development of

evidence-based guidelines to restrict the use of oral contrast, except in certain defined cases. Following adoption of these guidelines, the use of oral contrast in abdominal CTs dropped from 20,500 to 2,700. This tactic had two extremely positive flow outcomes. First, for the 17,800 patients who *didn't* have to have oral contrast, their burden was decreased not only by the 2.5 hours shaved off their ED length of stay but also by eliminating the burden of drinking the oral contrast. Second, by eliminating the waste caused by the unnecessary burden of oral contrast (since it did not add value but did add to the burden), this Emergency Department created nearly 46,000 *hours* of additional capacity (17,800 CTs times 155 minutes of delay per CT). Since the overall length of stay for this ED was 4 hours and 15 minutes, this action created potential capacity for over 10,000 additional patients.

While reducing variation is a common tactic used to improve flow, this example shows how we can sometimes dramatically improve flow by actually *increasing variation*. In this instance, the hospital increased variation by creating two pathways (oral contrast versus no oral contrast) where there previously had been one pathway (oral contrast for all patients). Increasing variation created the potential to treat an additional 10,000 patients per year while shaving over 2 hours off the length of stay for over 15,000 patients.

This somewhat counterintuitive phenomenon of selectively increasing variation to improve flow has been noted by others as well. In their landmark work defining high reliability organizations (HROs), Weick and Sutcliffe (2007) noted:

Much to our surprise, reliability does not mean a complete lack of variation. It's just the opposite. It takes *mindful variety* to assure stable high performance.

Successfully leading flow initiatives requires a deep understanding of this concept: *How much and what type of variation is the right variation, meaning of course the variation that improves value?* In developing this skill, two points deserve particular emphasis. First, as we have mentioned previously and will develop further in Chapter 4, leading flow requires creatively assessing which of the alternate ways of providing processes and services leads to value creation and waste reduction. Skill in experimentation is necessary to guide these efforts. If variation is blindly eliminated, experimentation is stifled and

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potential improvements in flow are lost. Second, if elimination of variation is the primary criterion for improvements in flow, there is very little room for diversity, which is a key ingredient of successful healthcare organizations. This concept includes not only diversity of culture, race, and ethnicity but also of learning styles and viewpoint about what success might look like. Thus, creativity, experimentation, and mindful diversity are necessary in determining how much and what type of variation best creates value.

These examples show that some burdens are necessary and can create value, while others do not and should therefore be eliminated. (It also shows that all of our processes need to be continuously revisited, since their value changes as the science changes, as the example of oral contrast for CT scans shows.) All this discussion leads us to an important insight about value added, burdens, waste, and flow:

All waste is burden, but not all burden is waste.

Armed with the new vision that the benefit-to-burden definition of flow allows and with the Flow Toolkit outlined next and in detail in the next chapter, leaders and managers need to become “flow detectives,” who prowl their units in search of the culprits (usually systems and processes, more rarely people) who provide no benefit and increase burdens to patients and providers alike. By sleuthing through their domain, they can help their staff identify those things that work effectively through the use of tools like value-stream mapping. Those areas should be accentuated. Similarly, we can identify areas that need to be eliminated, because they’re waste. It’s a combination of two forms of “hunt,” as Figure 1.4 shows.

Figure 1.4: The Two Kinds of Hunts

Flow is...

- A continuous **Treasure Hunt** to add value
- A continuous **Bounty Hunt** to eliminate anything that doesn’t add value

The bounty hunt and treasure hunt approach requires us to lead our units with a new spirit (described in more detail in Chapter 3), which encourages innovation in value identification and creation and a healthy disrespect for tradition in the merciless elimination of waste or non-value added processes or services. As we apply the calculus of the benefit-to-burden ratio, leaders must be aware of the constant dynamic tension between these two questions:

Why are we doing it this way if it doesn't add value?

Why not do it another way that adds more value?

These two questions are put to pragmatic use in our efforts to use flow as a way of assuring we design healthcare systems that get it right. We believe there are six clinical elements that we need to get right:

1. the right resources;
2. to the right patient;
3. in the right environment (bed);
4. for the right reasons;
5. with the right team;
6. at the right time—*every time!*

At each of these “right” inflection points, we need to consider how to use the benefit-to-burden ratio to increase value, maximize flow, and eliminate waste in a team-based environment and in a fashion that predictably delivers consistent results.

One additional concept is important in our definition of flow: expectations and their role in determining value. A deep understanding of patient expectations is central to improving flow, because we can't manage value unless we understand what benefits and burdens the patient expects. Broadly stated, expectations occur when we believe, usually for good reason born out of careful reflection upon our experiences, that certain things are reasonably certain to come about. To expect something is not to prejudge it or to fail to be open to the richness of new experience, but rather is the way to get mentally ready for the challenges of the day. With all deliberate actions, we (and our patients) make assumptions regarding the most likely of the many reactions that might occur and proceed accordingly. These implicit and

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explicit assumptions guide our choices. But equally importantly, they serve as the *infrastructure* for how we experience the world. Without infrastructure, it is impossible to assess our experiences, much less progress to better flow through improved value. Expectations are much like careful planning, which allows for excellence in execution. The dynamic tension between planning and execution is an old one and is illustrated by the healthy debate between two great generals in World War II. General Dwight D. Eisenhower, Supreme Commander of the Allied Expeditionary Force in Europe, believed that plans were the fundamental aspect of successful warfare, while his colorful and controversial Commanding General George S. Patton of the U.S. Third Army thought that “Execution, not plans, is the key to successfully defeating the German Army” (Axelrod 2006). Who was proven correct? Most students of military history would say that both of them were, depending upon the circumstances of the particular battle. Operation Overlord, the Allied assault on Fortress Europe on the Normandy beaches on D-Day, June 6, 1944, relied heavily on detailed planning. However, the Battle of the Bulge in December 1944 did not allow time for extensive planning and instead relied on Patton’s brilliant execution.

Discovering patient and family expectations in healthcare is fundamentally essential to creating value. As we mentioned previously, the best way to discover patients’ expectations is encompassed in two words: *Ask them!* Studies done by Studer Group (Meade, Kennedy, and Kaplan 2008) concerning hourly rounding found this question the most helpful in discovering expectations:

What’s the *one thing* we can do to make this an excellent experience and exceed your expectations?

Once we have discovered their expectations, we can then use our flow detective skills to develop a road map for how to improve flow by creating value and eliminating waste through the benefit-to-burden ration as our patients move through the service transitions and queues of healthcare.

To summarize briefly, flow is defined as adding value to processes or services by increasing benefits, decreasing burdens, or some combination of both when applied to the movement of patients through the network of service transitions and queues that characterize modern healthcare. Leaders

must be trained in and become expert at identifying opportunities to increase value (the treasure hunt) and eliminate waste (the bounty hunt) by using tools such as value-stream mapping, queuing theory, service transitions, EBM, and EBL to guide their detective work. That detective work will assure we have the right resources for the right patients in the right environment for the right reasons with the right team at the right time—every time!

THE FLOW TOOLKIT™

With the definition of flow as value added through the benefit-to-burden ratio in mind, the question becomes:

If that's what flow is, what tools are the ideal
ones to use to optimize flow?

The Flow Toolkit was developed over years of research in leading and coaching teams attempting to improve flow in their environments. It comprises seven key components, which we describe in detail in the next chapter. All of the aspects of the Flow Toolkit are helpful, but, as with any toolbox, there are different tools for different jobs. Effective flow leadership requires not just knowledge of the tools but the wisdom to know which tools to use in each circumstance. That is the focus of Chapter 2.

ABOUT THE AUTHORS

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Dr. Thom Mayer is the chairman of the board of BestPractices, Inc., and a medical director for Studer Group. He has been widely recognized as one of the nation's foremost experts in leadership, management, customer service, and flow in healthcare. He is also recognized as an expert in emergency medicine, pediatric emergency medicine, trauma, and sports medicine.

Emergency Departments under his guidance have won prestigious awards from virtually every organization recognizing excellence in healthcare, including Press Ganey, PRC, Gallup, the Institute for Healthcare Improvement, the American College of Healthcare Executives, the Healthcare Advisory Board, and the Robert Wood Johnson Foundation. Dr. Mayer also serves as the medical director of the NFL Players Association.

Dr. Mayer has published over 60 articles and 60 book chapters, and has edited fifteen textbooks. Most recently, Dr. Mayer has written *Leadership for Great Customer Service: Satisfied Patients, Satisfied Employees*, as well as *Leadership for Smooth Patient Flow*, both published by the American College of Healthcare Executives. The latter book was given the 2007 James A. Hamilton Award from the ACHE for the best book on healthcare leadership.

On September 11, 2001, Dr. Mayer served as one of the command physicians at the Pentagon Rescue Operation, coordinating medical assets at the site. The BestPractices physicians at Inova Fairfax Hospital were the

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Dr. Mayer's skill as a speaker is attested to by the fact that he has been the keynote speaker at numerous conferences, including the Press Ganey National Client Conference (twice), the PRC National Conference, and the Robert Wood Johnson Foundation Urgent Matters Conference, among others. He was named the American College of Emergency Physicians Speaker of the Year in the second year that award was given and has twice won the American College of Emergency Physicians Over-the-Top-Award for the highest scores among its speakers. Dr. Mayer was selected to present the most prestigious named lectureships for the American College of Emergency Physicians, the James Mills and Colin Rorrie lectures. Dr. Mayer has also spoken at Studer Group national conferences and regional conferences as well.

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Dr. Jensen is a popular speaker and coach for EDs across the country. He is coauthor of the 2007 ACHE Hamilton Award-winning book, *Leadership for Smooth Patient Flow*. He is the recipient of the 2007-08 ACEP Honorable Mention Speaker of the Year Award. Dr Jensen presents on patient safety, patient flow, operations management, and change management at the ACEP *Emergency Department Directors Academy*.

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“Improving patient flow is one of the most confounding challenges in the healthcare system. Yet, when we get it right, the rewards—in terms of patient and staff satisfaction, patient safety, reduced waste, and improved financial status—are enormous. This book is a tremendous resource, chock-full of ideas, tools, and examples that will enable the reader to hardwire better flow solutions into their system.”

—Carol Haraden, PhD,
Vice President, Institute for Healthcare Improvement

“I coined a term a few years ago, rather awkward but to the point: ‘gaspworthy’—as in, obviously, the audacity and power of the proposed program make you no less than gasp. Well, this is clearly a ‘gaspworthy’ effort. The big point: The approach laid out here is within the grasp of any hospital; it requires no alteration of outside forces. Hence, in my view, not to follow a path like this is a breach of duty to our patients as much as an inappropriate treatment protocol. Read it. Absorb it. Act. No excuses. Yes, ‘gaspworthy.’”

—Tom Peters, *One of the most influential business thinkers of all time,*
Author of *Reimagine: Business Excellence in a Disruptive Age* and *In Search of Excellence*

“A highly original and unexpected application inspired by the flow theory of optimal experience to the problem of managing patient flow in treatment centers. This book will be very helpful to anyone who is concerned to make sure that waiting for services will be minimal, and as enjoyable as possible—a huge boon in these days when wasting time is worse than wasting money.”

—Mihaly Csikszentmihalyi,
Professor of Psychology and Management, Claremont Graduate University, Claremont, CA

You know you have great healthcare providers. But are your systems and processes letting them maximize the time they spend with patients?

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The book extends and updates the principles of the authors’ award-winning first book, *Leadership for Smooth Patient Flow*. It also integrates concepts originated by Quint Studer, author of the bestselling book *Hardwiring Excellence*. Drs. Mayer and Jensen bring the industry’s richest experience to this subject.

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- Why it’s important to engage physicians in the flow process (and how to do so)
- How to apply the principles of better patient flow to Emergency Departments, inpatient experiences, and surgical processes
- What the future of patient flow will look like—and how to start preparing for it right now

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