

Innovation and Best Practices in Health Care Scheduling

Lisa Brandenburg, Patricia Gabow, Glenn Steele, John Toussaint, and Bernard J. Tyson*

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AUTHORS

Lisa Brandenburg

President
Seattle Children's Hospital

Patricia Gabow

Former Chief Executive Officer
Denver Health

Glenn Steele

President and Chief Executive Officer
Geisinger Health System

John Toussaint

Chief Executive Officer
ThedaCare Center for Healthcare Value

Bernard J. Tyson

Chairman and Chief Executive Officer
Kaiser Permanente

The authors were assisted in their efforts by the following individuals:

Kate Burns

Institute of Medicine

Mark Hallett

ThedaCare Center for Healthcare Value

Elizabeth Johnston

Institute of Medicine

Melinda J. Morin

Institute of Medicine

Murray Ross

Kaiser Permanente

William Rupp

Former Chief Executive Officer
Mayo Clinic, Florida

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Lisa Brandenburg, Seattle Children's Hospital; Patricia Gabow, formerly Denver Health; Glenn Steele, Geisinger Health System; John Toussaint, ThedaCare Center for Healthcare Value; Bernard Tyson, Kaiser Permanente^{1,2}

BACKGROUND

Patient waits have been a long-standing concern in health care. Waits occur throughout the continuum of care and are built into and budgeted for within day-to-day operations. The status quo is changing, however, as patient experience becomes linked to provider payment, efficiency and service become differentiators between hospitals and providers, and patient expectations evolve. While excellent clinical care remains the expectation, health care consumers are now seeking health care and supporting systems that are respectful of individuals.

In this discussion paper, we describe the important forces shaping wait times throughout health care, the evolving use of techniques and tools from other industries to improve health care access, and the move toward a person-centered model of care. Through our personal experiences leading our respective health care organizations, we have tackled these complex issues, and we present in this paper the lessons we have learned along the way. Notably, we acknowledge that improving access and scheduling requires systems-level transformation and that such transformation can uncover previously unrecognized resources and improve all aspects of care delivery.

Wait Times as a Systemic Problem

Recent reports of the challenges and consequences faced by patients receiving care in certain Veterans Health Administration (VHA) facilities have drawn attention to the occurrence of prolonged wait times in health care systems. In a broader context, it is clear that the problem is not exclusive to these VA(VHA) facilities. Similar problems exist throughout U.S. health care; prolonged wait times, scheduling difficulties, and an imbalance of supply and demand are issues in both the public and private health care sectors.

Recent VA(VHA) data report that the average wait time for new primary care appointments at VA(VHA) facilities was 42 days (VA, 2014). Although data from the private sector are scarce, a 2013 study of the Massachusetts private sector reported wait times of 50 and 39 days for internal medicine and family practices respectively (MMS, 2013). Similar observations could be made elsewhere, underscoring the fact that while the recent VA(VHA)

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practices garnered national attention, such problems are similar to, no worse than, and in some instances may be better than those sometimes experienced by nonveteran patients and their families.

This problem of scheduling and access is further complicated by the lack of clear, evidence-based standards for appropriate wait times for both routine primary and specialty care. Although “third next available” (TNA) appointment and “office visit cycle time” are validated measures,³ further spread of their use is needed. Best practices from localized markets currently exist as the only comparisons available. What is clear is that the timing and setting of care should be considered in the context of patient condition and health status.

Cost of Waiting

The impact of long patient wait times on health outcomes is not well studied, and the sparse study of the issue precludes making any broad conclusions, except for those individuals with acute conditions, where difficulties with access and lengthy wait times are associated with negative outcomes. Prolonged wait times represent a burden on patients and their families, as reflected by diminished quality of medical care and the adverse experience of obtaining and receiving care. Although not reflecting health outcomes directly, patients with nonurgent needs who experience prolonged wait times have been shown to have a higher rate of noncompliance and appointment no-shows (Kehle et al., 2011; Pizer and Prentice, 2011).

Prolonged wait times and access deficiencies also have a negative impact on providers and staff. Although often unacknowledged, the inefficiencies that exist throughout health care have been found to contribute to the high level of provider dissatisfaction and burn out in primary care (Sinsky et al., 2013). Using fewer and longer in-person visits and designated patient outreach, Group Health teams were able to integrate e-mail messages, telephone visits, and proactive care activities into their everyday work flow with a significant decrease in provider burnout (Reid et al., 2009). Spreading best practices in scheduling and access may help to reduce professional and team frustration, and to rekindle the satisfaction and joy in care delivery.

In addition, eliminating prolonged waits can alleviate unnecessary costs (Gilboy et al., 2011). The positive return on investment that might be anticipated from a redesign of scheduling processes could be substantial for the patient and the health care system. Scheduling improvements alone can maximize provider supply with a resulting decrease in wait times for appointments. When coupled with process redesign to increase patient flow through the system, the improved patient volumes could yield increased access for the patient as well as financial gains for the institution—directly in a fee-for-service (FFS) environment—while also improving patient and provider satisfaction.

³ Third next available appointment is defined by the Institute for Healthcare Improvement (IHI) as the “average length of time in days between the day a patient makes a request for an appointment with a physician and the third available appointment for a new patient physical, routine exam, or return visit exam” (IHI, 2015c). Office visit cycle time is defined by IHI as, “the amount of time in minutes that a patient spends at an office visit. The cycle begins at the time of arrival and ends when the patient leaves the office” (IHI, 2015b).

Scheduling in a Complex System

Scheduling of appropriate health care services is a complex issue that requires the balancing of clinical criteria and acuity; patient needs; and organizational resources, structure, and culture. The science of optimizing access and wait times is still evolving, with little comprehensive measurement of wait times for appointments, and with targets that are often pragmatic—reflecting practitioner, staff, room availability, and cost—as opposed to evidence based. While these components are measurable, many other confounding factors influence the capacity of health systems to offer appointments in a timely manner. Looking beyond the challenges in the ambulatory primary and subspecialty environments, hospitals and rehabilitation experience have their own struggles with scheduling and prolonged wait times causing patient and provider irritation, operational inefficiencies, and increased cost. The system complexities can be overwhelming to unbundle and the multiple improvement efforts that have occurred in clinics, hospitals, and rehabilitation centers may be uncoordinated, and opposing incentives often result in bottlenecks in other areas.

Dynamic Landscape in U.S. Health Care

The examination of wait times and scheduling complexities is occurring at a time of rapid change in U.S. health and health care. Beginning with the 1999 and 2001 release of IOM reports, *To Err Is Human* and *Crossing the Quality Chasm*, there has been an increasing emphasis on quality, safety, and, increasingly, the cost of health care (IOM, 1999, 2001). With the Institute for Healthcare Improvement's (IHI) coining of the term "Triple Aim" (better population health, better care experience, lower cost) in 2007, and with the extensive provisions of the 2010 Patient Protection and Affordable Care Act, there are likely to be further changes in patient expectations of U.S. health care (IHI, 2007; USC, 2010). National and statewide mandates are requiring that hospitals comply with resource intensive and—in many cases—unproven measure reporting methods aimed at monitoring and improving patient safety and quality.

Simultaneously, public scrutiny of health care has been sparked by the burgeoning expense and complexity of our care delivery systems. All levels of health care organizations, from the private practice to the largest public- and private-sector systems, are attempting to improve efficiency and decrease costs through national policies and economic incentives while prioritizing quality in a "better, cheaper, faster" approach to health care (Thompson and Davis, 2001). Of note, these goals were successfully met within the Veterans Health Administration following transformative efforts in the 1990s, demonstrating that medically appropriate, cost-effective health care, delivered locally is certainly possible (Kizer and Dudley, 2009). Improvements must also be sustainable in order to ensure transformation.

WAIT TIME FORCES AT WORK

The Scheduling Conundrum

While acute care delivery in the United States is largely, although not exclusively, allocated on the basis of patient urgency, scheduling of elective patient visits is rarely based on acuity. Rather than relying on standards of acuity, scheduling is largely driven by other factors, such as when the patient calls, appointment availability, physician templates, and work-arounds including overbooking for certain patients and prioritizing referrals from certain doctors, and insurance status. These constraints add further complexity to an already overburdened scheduling process that is designed primarily to meet the needs of the organization, staff, and providers, which often overshadow the needs of the patient.

Despite the national interest in moving to a person-centered model of care, patient and family preference is often a secondary factor, resulting in limited choices, little attention to patient preference, and often prolonged wait times. Insurance coverage, in particular, has been reported to be of key importance in the private setting where patients with Medicaid or no insurance coverage have longer wait times (Bisgaier and Rhodes, 2011). Although subject to many of the same scheduling constraints as the private sector, until recently there has been little insurance prejudice within the VA(VHA) system, offering evidence that insurance type alone does not determine wait times and access difficulties. The many subtle yet additive nuances of factors particular to each health care system, and its providers and patients, are likely to be the determinant of scheduling delays and wait times for insured patients.

Role of Patient Acuity and Triage

Scheduling in health care is different from that in other industries. The physiologic state of a patient is dynamic, introducing an inherent uncertainty into patient flow. This uncertainty or clinical variability is not consistently addressed in scheduling systems for elective appointments, resulting in an ad-hoc method of triage. Most systems can respond to the most acute, emergent patient with the temporary re-allocation of staff to meet unexpected demand. However, for routine or elective visits, acuity is evaluated using disease- or circumstance-specific tools developed within each system with little standardization and few national benchmarks upon which to draw for comparison.

Environments that have focused on developing processes to manage patient variability and high acuity are emergency departments (EDs) and operating rooms (ORs). In these environments, patient acuity is the driver of scheduling, with those patients who are most ill or at risk receiving care first. Although not standardized throughout the country, there are several common acuity-based examples of triage tools including the Emergency Severity Index, the Canadian Triage and Acuity Scale, and the Trauma Triage Tool (Gilboy et al., 2011; CAEP, 2015; Sasser et al., 2011).

However, it must be noted that even with these tools, the ability to predict human physiology is often inaccurate and makes scheduling based on acuity operationally difficult. Thus, in nonacute settings, including ambulatory primary and specialty care, triage- and acuity-based scheduling has not proven effective for the allocation of appointments. A better orientation is an open access or same-day access model where schedulers do not allocate appointments based on attempts to estimate acuity (Murray, 2003). Appointments are not booked weeks or months in advance, rather each day starts with a sizable share of the day's appointments left open, and the remainder booked for those who elected not to come to the office on the day they called. In transition, this model requires the disciplined measurement of demand and capacity, the addition of providers if there is a permanent mismatch, elimination of appointment types and eradication of the patient backlog (those booked for future appointments), and will involve a temporary increase in patient visits per day until the backlog is eliminated through the gradual loosening of criteria for patients needing same day visits (IHI, 2015).

Considering the Health Care Setting

The predominant model of ambulatory health care currently involves intermittent visits to a physician's office, whether in a private practice, a group practice, or a hospital-based clinic. Access to visits can be constrained by many factors: system design, including geographic availability, hours of operation, IT capability, and practice management; availability of providers, including expertise and numbers individual preferences, and accountability; and capability of patients, including preference, transportation, and insurance status. Balancing these factors when scheduling appointments makes the scheduling process exceedingly complex and often frustrating for patients and providers. Newer models of care aim to simplify this model, with the development of targeted strategies to standardize processes, simplify steps, and redesign the local system of care.

In the acute care setting, the traditional model of managing patient flow based on acuity alone resulted in significant wait times for patients with issues that were not life threatening (McCarthy et al., 2009). As a result new approaches have been developed, such as “fast track” treatment, to provide care for patients not requiring complex acute care, real-time visualization of wait times, and active bed management for hospital admission. Other methods such as decanting care to non-ED settings and predictions of patient demand have also been increasingly used methods to address the wait times (Espinosa et al., 1997; Schiff, 2011; Rabin et al., 2012).

The inpatient setting also suffers from increasing waits and delays for a variety of testing and procedures as well as for discharge due to different staffing at night and on weekends, and imposed constraints of academic medicine. Discharge from an acute care setting often represents another bottleneck, with delays and waits for admission to rehabilitation centers, skilled nursing facilities (SNF), or even transportation to the home setting (MacKenzie et al., 2012). Thus, it is clear that scheduling and wait time problems exist throughout all settings in health care and require the same attention to operations management that exists in other industries but balanced with the needs of patients.

Changing Role of the Customer-Patient

Health care delivery is fundamentally devoted to improving the human condition, yet too often our current processes dehumanize, disrespect, and ignore this essential aspect of medicine. The current challenges with scheduling, and resulting wait times, often occur with little regard to the patient and family. Although their preferences are noted in the scheduling process, patient and family understanding of patient acuity is typically incomplete. Because they cannot be aware of all the details of the scheduling process and operational constraints of their local doctors office, ED, or hospital, patients can be angry, frustrated, and insulted when their concerns do not result in immediate assessment and attention. Clearly important to the design of scheduling and triage systems is incorporation of approaches aimed at setting expectations appropriately, and ensuring respect for patients' anxiety and fear (Cosgrove et al., 2013).

Adding to these challenges is the lack of appropriate measurement of the patient experience. Patient expectations are measured indirectly, using surveys including the Hospital Consumer Assessment of Healthcare Providers and Systems survey (HCAHPS), instead of through direct feedback. Direct feedback is elicited by Press Ganey surveys and in a more rapid fashion using email, mail, or phone surveys. However, as patient experience reflects interaction with many interdependent processes and providers, often crossing multiple lines of authority, localized attempts to correct a problem may be only partially successful.

Increasingly, patients are turning to an emerging model of health care: the retail clinic. Retail clinics have emerged as a low-cost and convenient alternative to the traditional model of ambulatory care, providing a discrete set of acute care and preventive services, on an as-needed basis. Patient response to this type of service has been overall quite positive, driving the proliferation of such clinics, and the accreditation of the two largest retailers by the Joint Commission has helped to ensure practices that are consistent with national quality standards (Kaissi and Charland, 2013; Zamosky, 2014; Cassel, 2012).

Managing the Health Care Workforce

The U.S. health system remains a provider-centric model with care delivery defined by standard business hours, although this is slowly changing. Hospitals, clinics, and ambulatory practices are increasingly expanding hours and evaluating processes to achieve scheduling flexibility. Yet, the current model remains a one-size-fits-all appointment system, whether the patient is a healthy child or a complex, chronically ill adult.

The growing trend and concern surrounding health care workforce shortages has only been further emphasized by demand for increased care coverage under the Affordable Care Act (ACA). According to an estimate from the Association of American Medical Colleges (AAMC), the United States will encounter a shortage of more than 130,600 physicians by 2025, without better use of nonphysician providers and staff (AAMC, 2014). Although social workers, patient navigators, nurse practitioners, and other health care professionals have redesigned their roles to

proactively accommodate this gap, the persisting scheduling delays in both private and public health care indicate that further change is needed. There is an increasing call for the redesign of office practices to reduce inefficiency and improve capacity through better use of existing office staff, retooling of office processes, increased previsit work, and non-face-to-face visits (Shipman and Sinsky, 2013; Kanter et al., 2013).

Need for Strategic Design

Despite being considered an important element of care quality, measurement of wait times using the IHI measures, third next appointment or office cycle time is not performed throughout the United States, with little benchmarking data released nationally. In the private sector, their development frequently includes little systematic assessment or improvement. Many scheduling processes have not been designed intentionally and have merely grown in response to internal constraints, resulting in wait time standards and capacities that vary significantly across care facilities. Underlying these problems is the use of a one-size-fits-all standard to wait times and scheduling, the lack of data-driven practices, and the reliance on behavior change to accommodate changes in patient flow. The result is typically a set of scheduling practices that are idiosyncratic down to the provider level and unworkable for the staff charged with following them. The recent experience of the VA(VHA) is an example of a national problem of flawed system design coupled with flawed leadership that has resulted in frustration, needless suffering, and inefficiencies throughout U.S. health care.

The capacity to provide care is often driven by the supply of physicians and health professions at a particular institution and is unevenly distributed across the country. Because facilities in urban centers tend to house more specialty and subspecialty physicians than those in rural settings, patient influx and wait times can often be exacerbated at larger hospital centers. In a survey of 4,000 emergency rooms, the wait at public hospitals or major teaching hospitals tended to be longer than those at other care centers (Hsia et al., 2013). These challenges have led to the exploration of systems engineering strategies and processes for optimizing resource use. While these concepts have been introduced as strategic solutions, the spread and depth of their implementation is still lagging.

Scheduling and Wait Time Metrics

A noted opportunity lies in the metrics used to assess wait times that measure the key components of access, scheduling, and outcomes. The commonly used measure for outpatient appointment wait times in current use is based on the IHI recommendations for “third next available” appointment, that is, an organization’s goal for their performance with respect to patient access should be to achieve a TNA of zero for primary care and of 2 days for specialty care (IHI, 2015c). This standard was designed for primary care yet has also been adopted by many subspecialty practices. This measure indicates an organization's performance with respect

to patient access, indicating how long a patient waits to be seen. Although no specific numeric standard exists in the public or private sector, third next available appointment represents a nationally reported measure against which organizations can monitor their performance with a goal of seeing patients when clinically indicated and when they desire (Murray and Berwick, 2003). This standard was designed for use in outpatient primary care yet has also been adopted by many subspecialty practices. Third next available appointment is felt to represent a more accurate assessment of actual appointment availability and function of the system, rather than an opening due to a cancellation or acute event (IHI, 2015c).

Other measures of access are less common, with few systems reliably tracking the travel distance to an appointment or actively managing schedules to coordinate appointments for those coming from afar. In the acute care setting, within emergency rooms and hospitals, metrics are increasingly reflecting aspects of access that are relevant to patients and families such as parking availability, the registration experience, and the discharge process, while other measurement activities reflect system function such as availability of a test result, time to obtain a procedure, and operating room turnover.

Role of Incentives

It is repeatedly emphasized that the incentives for U.S. health care are misaligned. In the postacute care environment of a rehabilitation facility, a full census is a priority with few incentives to speed discharge processes. While financial incentives are commonly used at the leadership level, some organizations are now using direct incentives for frontline staff, which offers the opportunity to have additional data and work on process challenges that get in the way of day-to-day high-quality, patient-centered care.

Incentives can have unanticipated outcomes. For example, the incentives of emergency rooms to shorten wait times have resulted in an increase in unnecessary admissions (Hsia et al., 2013). The recent use of bonuses tied to appointment wait times while potentially successful in other settings, resulted in falsifying data when combined with an intolerant management style (Kizer and Jha, 2014).

Exploring New Models of Scheduling

The challenges noted have led some health care leaders to explore new methods to improve scheduling and patient access, including methods of systems engineering and operations management, used successfully in other industries including aerospace, power distribution, and manufacturing. These techniques include Lean, six sigma, and the use of modeling and prediction tools to analyze, improve, and optimize the performance of complex systems, including health care (Litvak and Bisognano, 2011; Toussaint and Berry, 2013; Pocha, 2010; DelliFrane et al., 2010).

Viewing a health care organization as a system, rather than as discrete local environments, identifies multiple areas of overlap and interdependence allowing overall performance to be optimized and achieve better efficiency. The methods developed by operations research and systems engineering to match supply and demand has led to substantial improvements in cost, efficiency, and patient satisfaction in select hospitals, patient populations, and clinics (Litvak and Fineberg, 2014; Rohleder et al., 2013). Yet, these efforts are nascent, localized, and not necessarily scalable (Watts et al., 2013).

Commitment to creating a high-value patient experience is required in order to affect real change in institutional practices and outcomes. Although leaders are well meaning, too often they lack simple awareness of alternative approaches, or, if known, there is a lack of commitment to do the hard work of system redesign.

OUR EXPERIENCES

Below we describe approaches that have been successfully applied to scheduling, care design, and triage practices in our organizations, despite our very different profiles and structures. Our organizations include a pediatric hospital, a safety net health care system, local and national integrated health care systems, an integrated community-owned health system, and a managed care health care system. Although our organizations differ in size, populations served, and institutional constructs, these themes and the strategies described are broadly applicable to all of U.S. health care. Accordingly, while examples are given from some institutions, each of our institutions employed these strategies, and they are broadly applicable in health care. Attention to the barriers to flow and removing waste will increase capacity, enable timely care delivery, and improve care. It must be noted that these approaches were part of a larger, comprehensive effort to redesign care delivery. That is to say, they were not solely focused on scheduling or access.

It should be underscored that efforts to improve access within our organizations are ongoing. Our organizations are committed to continuous process improvement and recognize that improvement is not static but rather an iterative process. As such, the examples contained within this discussion paper often reflect efforts within a single service line, practice, or geographic location. It is widely recognized that much more remains to be done before effective scheduling and access is a systemwide characteristic. That being said, and recognizing the unique constraints of each organization, three overarching principles are common throughout all of our efforts: *the application of a systems-thinking approach, the use of a disciplined methodology for system redesign, and a foundation of respect for people*. These are discussed in the next section.

Common Themes

- *Application of a systems-thinking approach.*

A common strategy of our organizations was the consideration of our institutions as complex systems. Tantamount to determining how to best implement change and mitigate unanticipated outcomes was recognizing that, rather than discrete environments or services, our organizations are complex groups of interdependent processes, personnel, and incentives. For example, looking beyond the immediate problem of delayed clinic visits enabled us to see problems with referrals for subspecialty appointments, difficulties with weekend discharges, or inadequate communication during appointment requests. A systems-level approach ensures that all aspects of a complex system are considered, including how the system elements interact with one another over time.

- *Use of a disciplined approach to system redesign.*

Our organizations used system-thinking strategies to tackle access challenges, and they all used a disciplined methodology, albeit different methods, to ensure that improvements would be effective, efficient, and provide value to patients and their families and the organization. The two best known approaches, Lean and six sigma, are management philosophies and tools successfully used in other industries that are now being adopted in health care. Lean focuses on eliminating waste from the patient perspective to achieve uninterrupted flow from the beginning to end of the process. All the steps in the process represent a value chain—or the “value stream.” Lean uses an array of tools to see the waste and barriers and to remove the waste in every flow of work (Graban, 2008; Gabow and Goodman, 2015). Six sigma is another management technique aimed at eliminating defects by reducing variations, in order to enable more capable products and processes (Revere and Black, 2004). The use of a disciplined approach removes blame and politics from process improvement, and focuses priorities on improvement for the patient or family.

- *Respect for people.*

An underlying characteristic of our health care organizations is a respect for people—for everyone—patients, families, and the many people that keep our health systems running. Patient and family needs are placed at the center of the care process, and they are involved in the redesign of our health care system. They are encouraged and enabled through system design to become stewards of their own health. Too often respect for patients or patient engagement amounts only to empty words; however, for our organizations, moving to a culture of respect was key to our system redesign. It provided a principle to guide every decision, every change, and every interaction. As a pillar of Lean philosophy, respect for people also refers to those working in our medical practices or hospitals. This includes a culture that gives everyone the

tools and the opportunity to become problem solvers; enhances individual creativity, values teamwork; and engenders communication, trust, and respect between frontline staff and senior levels of management.

APPLYING THE OVERARCHING PRINCIPLES

Using Technology and Data to Drive Change

Practice transformation in the Denver Health primary care clinics underwent a strategic restructuring to improve patient access and decrease wait times. Sophisticated analytics were applied using demographic, clinical, and pharmacy data and recent utilization information to categorize patients into levels of care to better define their needs for enhanced primary care services. They discovered that within Denver Health's population of about 130,000 clinic users, almost 80,000 individuals appeared to be largely healthy with few additional needs beyond being reminded to access regular preventive services. By contrast, just 2 to 3 percent of the adult population routinely accounted for 30 percent of total charges and tended to have multiple comorbid physical and behavioral health conditions and complex care coordination needs (Gabow and Goodman, 2015). Although it was clear that not all patients had the same needs, the existing model of care delivery provided care for all patients in same way, using the same care teams, same visit type, and same electronic connections. In subsequent efforts, Denver Health used these risk stratification data to redesign patient identification methods, care team staffing model, and the clinic visit standard work to better match patients' needs and ensure appropriate access (Gianani and MacKenzie, 2000). Of note, many of the needs were for social services rather than health care services, given the vulnerable nature of those in urban populations.

At Seattle Children's, the first step to improving the prolonged emergency department waits involved partnering with Cerner to redesign the hospital electronic health records (EHR) system. This allowed a transition from retrospective reviews of wait times to real-time monitoring, in order to allow for the rapid trialing of improvement techniques in the emergency department and the improvement of patient flow-through to the inpatient facility. A visual dashboard with a speedometer was designed to display wait times, from patient arrival in the ED to arrival on the inpatient ward. Using techniques of Lean acquired during a leadership program studying the Toyota production system, Seattle Children's was able to identify wasteful processes and implement efficient processes, including appointments for beds, real-time communication, and advanced planning techniques for hospital admissions. These initiatives have resulted in a 25 percent improvement in patient flow-through for admitted patients, with a secondary effect of decreasing wait times for patients not requiring admission.

To achieve high levels of work flow reliability in primary care clinics within the Geisinger Health System, EHR and phone apps are used to eliminate dependence on individual diligence or memory. In an effort to minimize variation and wasted activity, processes are designed to consistently deliver the needed care for every patient, in every office, every time. Incorporation of new processes into reliable work flows has been seen as a critical step. The processes include work flow reminders, EHR tools, and other environmental prompts to

“hardwire” the needed steps into place. Leveraging various data sets to provide just-in-time feedback to the team has helped Geisinger staff to identify gaps and areas of variation that need additional redesign.

Improving Flow

System redesign efforts at Kaiser Permanente focused on hospital delays, or internal waits. Beginning with elective surgeries, data aimed at reducing surgery backlog was collected on wait times. However, rather than directing their efforts to a specific area affected by delay, a systems view was adopted to look at the entire care pathway: preadmission, surgery, recovery room, and postoperative care. Through relatively simple changes, including longer use of operating rooms each day, Saturday procedures, and simple process changes, Kaiser Permanente increased their efficiency as the OR utilization percentage to above 85 percent.

Likewise, following the implementation of Lean principles at Seattle Children’s outpatient center, Bellevue Clinic and Surgery Center, there have been multiple process improvements involving operating room access. By reviewing work flow and using standard work methods, scheduled operations now begin on time with a 99 percent success rate. Removing wasteful processes for patients with heart attack has dropped the “door-to-balloon” times at Thedacare in Wisconsin from the national average of 90 minutes to 51 minutes.

Determining Capacity: Balancing Supply and Demand

These examples underscore the untapped capacity that exists in our systems that can be uncovered via a variety of approaches, including applying standard work to provider templates; using the robust data that we have on patient demand by month, day, time, and patient type; redesigning clinic processes to maximize provider availability; and using non-face-to-face visits.

At Seattle Children’s, the scheduling and wait time challenges for the ambulatory clinics were found to be both resource and process dependent. Using a variation of level loading—a method used in Lean manufacturing—in our scheduling process, unnecessary variation has been reduced that negatively impacted (supply) or provider availability to meet the needs of patients (demand). Similar to the processes enacted by Denver Health, Seattle Children’s also uses a centralized scheduling center coupled with a standardized process to manage schedules and fill vacancies, using real-time communication to troubleshoot in order to yield a more streamlined and efficient process. However, improving the resource component has been more challenging and has required an in-depth examination of the supply (provider’s availability) and the demand (patient need for visits). An increase in demand for evening appointments was met with the addition of evening clinics and based on trending data for hourly, weekly, and seasonal variation. As a result, a flexible supply of providers has been constructed.

Like Seattle Children’s, a key component of health care redesign at the Mayo Clinic has been a focus on improving supply through an increased flexibility of provider supply in the

ambulatory environment. As part of the vast culture change, full schedules are now set as the expectation for specialty physicians. Rather than allowing schedule gaps, specialists are scheduled to see general patients, adding flexibility to the system through active management of the scheduling system.

For safety net providers, scheduling gaps are particularly challenging. The complexity of the patients' lives often results in high no-show rates which can approach 30 percent. Moreover, longer wait times for appointments increase no-show rates, creating a multiplying effect that has a significant impact on access (Parikh et al., 2010). A successful strategy employed by Denver Health to maximize appointment utilization included the use of same-day appointments. Another real-time access strategy adopted by Denver Health was a 24/7 nurse advice line, which enabled vulnerable patients with complex lives and transportation challenges to access care when it was convenient for them. This line received over 100,000 calls per year, and patients often were able to use a lower level of care once they spoke to a nurse (Bogdan et al., 2004).

Kaiser Permanente medical offices evaluated historical data to predict and meet demand. Demand for appointments was known to be greater on Monday mornings with a seasonal fluctuation such as flu season, allergy season, and camp and school physicals. Offices are staffed for this predicted variability. Variability of supply is also tracked, including trending in provider vacations. As historical records indicated a 15 to 20 percent no-show rate for mental health visits, Saturday hours were established to reduce missed appointments. Vigilant and dynamic management is required to make on-the-fly adjustments when events happen that upset the balance. Occasionally, heavy lifting is needed by organizational leadership to strike the correct supply balance, especially when it involves standards around the number and length of visits.

For subspecialty visits at the Mayo Clinic in Florida, the strategy for appointments requested for primary care physicians or other subspecialists required deviation from the status quo. For patients referred to a specific member of a specialty group the referral model was redesigned to include segmented visits, with only a partial visit or single visit with the sub-specialist. This novel use of relatively fixed resources, coupled with process improvements, has ensured that appointments are allocated based on patient preference. Specific subspecialty appointments requested from primary care physicians or other subspecialists required further deviation from the status quo.

Redesign of Clinic Work

In the Geisinger system, managing work flow in the primary care clinic started with redesign of the office workforce, including the formation of a multidisciplinary team, with new members and new roles, as well as the addition of a case manager. This model is novel in that the physician works in new ways with the adapted teams. The physician remains the leader but shares the responsibilities for patient care with many others. Patients see each team member as an extension of the relationship that they have with their personal physician. As some patient

needs could be handled by others on the team, there was a resulting increase in capacity and decrease in wait times.

Standard work has included determining assistant roles, standardizing exam rooms to avoid “hunting and gathering” of equipment and supplies, colocating providers with assistants, creating a standard process for placing patients in exam rooms, and standardizing the process of obtaining prescriptions and laboratory visits. In ThedaCare clinics, the application of standard work has resulted in more than 90 percent of ordered laboratory tests performed at the time of the patient visit, with available results within 15 minutes. A key component of the successful model has been the allocation of responsibility of clinic flow to one individual each day, allowing for observation of standard work, intervention when flow stoppers occur, and an understanding of the desired daily performance.

Denver Health used Lean to redesign pediatric clinic work flow to eliminate hand-offs and waste between providers and medical office assistants by having them in the exam room at the same time to work in parallel rather than traditional a sequential work flow. This decreased overall visit time while keeping provider patient time the same and allowed for a 12 percent increase in scheduled visits per session (O’Connor et al., 2010).

In Wisconsin, ThedaCare has used the core concept of the clinician as the pacemaker for the ambulatory care process. Outpatient clinics have applied Lean techniques to improve patient flow with the creation of standard work, a fundamental tool for improvement. If the office visit length for a particular provider exceeds the patient arrival rate (also known as Takt time—available time in minutes divided by demand for visits during that time), patient waiting is unavoidable. ThedaCare uses face-to-face contact time, combined with prep time before and documentation time after the visit, to develop the visit cycle time upon which templated visit lengths are based. Tasks that can be safely, reliably, and legally delegated to nonclinician staff are performed by those staff. When multiple clinicians in “clinical microsystems” of this type are aggregated and scheduled to meet historic demand, smoother flow allows Thedacare physicians to successfully meet the different peaks of demand and increase clinic through-put when necessary on a day-to-day basis.

Respect for Patients and Families

Ultimately, the speed of access and redesign efforts need to be measured from the patient’s perspective. For example, Kaiser Permanente used patient reported data to assess their performance. Using the HCAHPS surveys, which evaluate the patients’ ability to receive timely care, system redesign efforts yielded a jump from the 10th and 20th percentile to the 50th (HCAHPS, 2015).

While each of the participating organizations has worked to activate patients as an informed partner, the experience of Seattle Children’s is quite telling. The organization was in the midst of the ambulatory practice redesign when it was discovered that while wait times had decreased by 50 percent, patient satisfaction was not increasing. Evaluation of the process

revealed that some families did not want same-day access. School, jobs, vacation, and daily life were higher priorities, and families were unhappy when not provided with a choice. Further study found that the majority of customers/families wanted an appointment within a week, which led to a move from the previous method of scheduling to one assessing need and preference of families. Leadership is now evaluating other organizational assumptions about patient preference, which will undoubtedly be better for all.

Identifying Benchmarks and Setting Standards

Scheduling and wait time standards are dynamic, based upon capacity, which can still be easily disrupted. Within the emergency room at Seattle Children's, processes were examined to align with the national best practice of 4 hours from check in to obtaining an inpatient bed. Using a visual dashboard with a speedometer, techniques of Lean were used to streamline and remove waste from this process bringing their wait time down to 4.25 hours.

CONCLUSIONS AND LESSONS LEARNED

Best Practices, Best Outcomes

As demonstrated in the case studies above, strategic and fundamental techniques common to other industries were used to improve access and scheduling in widely respected health care organizations. While the tactics and environments of care differ, each example reflects the underlying recognition that prolonged wait times are a symptom of larger system-related issues, not amenable to the simple addition of personnel or quick fixes. The measurement of supply, demand, and capacity; attention to process redesign; the use of Lean; the move to a person-focused system; and the willingness to experiment and change continuously rather than relying on increased resources were essential components of the change processes in our organizations. Together they provide evidence that scheduling problems are not only solvable but are also within reach of organizations of all types.

Starting With the Basics: Supply and Demand

Just as each patient is different, so is each health care system: for example, a VA(VHA) Community Based Outpatient Clinic (CBOC) in rural South Dakota or a quaternary care hospital in Denver has profound differences from a mental health clinic in Washington, D.C. Yet the principles outlined above have been successfully used in all. Achieving best practice in access and scheduling began with an understanding of the basics: capacity, supply, and demand. Improvement in each hospital or clinic started with evaluation of the current process, determining its capacity or capability as the stepping off point for all other activities. A cardiology clinic that only has a cardiologist present 1 day per week will have a very different capability from a group practice seeing patients every day. Our institutions have demonstrated

that there is hidden available capacity throughout most systems. Predicting capacity in a hospital setting can be more difficult, as variable patient physiology directly affects the capability of the system. We can only go as fast as patient physiology allows. However, flexing of supply can be used to meet demand, including the use of temporary units during periods of high demand and the extension of operating room hours to include Saturdays. Moreover, every system has available data on usage by month, day, time, and patient type, which should be used to match supply and demand.

Criteria and Approaches to Setting Standards

We have already noted the scant evidence base for standards on patient access and scheduling. Although tempting, setting a specific national standard would be arbitrary and likely counterproductive, especially without better information. Before national standards can be met, honest internal looks at individual setting capacities and internal standard setting and testing, as well as sharing, is needed. Determination of capacity, knowledge of supply and demand, organizational agreement on the need for system changes, and a disciplined systemwide approach to achieve that change are essential to optimizing scheduling and access processes. A strategy to prioritize organizational activities is needed, which can then guide the determination of necessary personnel and process improvements toward the goal of a best practice. However, inadequate capacity is not an excuse for inaction, and should result in a staged plan for improvement, including a focused effort to identify patient-centered alternatives to face-to-face visits. Once internal standards are met that are meaningful and achievable by each organization, a culture of continuous improvement should motivate further efforts, producing new national benchmarks.

Planning for Variability

Patient acuity must remain a key driver in every health care system and a necessity in acute care environments, including the ED and OR. Yet, elective appointments should not be allocated on the basis of anticipated acuity due to condition or diagnosis. Rather, practice design should provide for same-day access. Ambulatory systems can proactively plan for variable patient demand by either scheduling gaps or flexing capacity to respond to it as noted in the case studies above. This allows for an unexpected increase in patient volume, an urgent patient need, or a patient with unusual complexity to be seen without disrupting the flow of patient visits. By evaluating processes, variability is often predictable, such as the increase in appointment requests after a long weekend or the decrease in elective surgery around the winter holidays.

Scheduling for a Service Industry

Patients with different real and perceived urgencies should be served with alternative approaches for different expectations for access in terms of time and type. Organizational

leadership and patient expectations need to have a realistic relationship to available resources, requiring transparency of both the needs and resources. Expectations should be based on system capability not used as an excuse or an opinion, and in a culture of continuous improvement capability should have ongoing management. Setting metrics without these aspects being clearly defined will likely lead to gaming of the system and dissatisfaction for all involved.

Much of the current understanding of satisfaction with access, scheduling, and wait times is obtained from nonspecific surveys. As demonstrated at Seattle Children's, our baseline assumptions can at times be incorrect, and better ways of assessing and involving patients must occur. Current health care processes are not designed for patients and their families, our customers, but for the benefit of clinic and hospital personnel. Involvement of patients in the redesign process and the use of data are essential, from hours of clinic availability to the flow of patients in an ED, along with the transfer process from an acute care facility to a rehabilitation setting. The design has been one-sided for too long.

Improving Access Through Novel Approaches

The majority of medical care in ambulatory, hospital, and rehabilitation care environments involves face-to-face care with a physician. Yet there is increasing evidence that at times this is both unnecessary and expensive when care can be provided by another provider, at other venues, or by other means (Naylor and Imison, 2010). Technology can improve patient access to health care both directly and indirectly (IOM, 2012). Telehealth or telemedicine, the use of electronic information and technologies to support long-distance health care, can be used as an alternative to an in-person visit to a physician to provide better access to care at a lower cost (Charles, 2000). An initiative performed by the VA(VHA) found that access to telemedicine reduced the number of hospital admissions by 20 percent (Darkins et al., 2008). Similarly, Kaiser Permanente Northern California improved their capacity and lowered the cost of care by applying cost-effective technology, such as the Internet, mobile, and video technologies (Pearl, 2014). The expansion of virtual care into home-based care demands the development of new payment models to ensure that providers are properly reimbursed and incentivized to install and use these capabilities in their practices. As shown above, health care no longer requires a 30–60 minute physician visit, but can occur by telephone, a visit with a nurse practitioner, or an abbreviated check by a subspecialist.

Another novel method of improving access involves decanting hospital access to more local environments, which would ensure a more stratified and distributed access to health care. Much of the success in achieving 85 percent immunization rate within the Denver Health System was due to care provided in school-based clinics. The basic patient evaluation must include an assessment of what each patient needs for care, what structure is needed to provide it, and an awareness that patient needs may change. Several approaches have already been demonstrated at VA(VHA) sites, including the immediate access to specialists using an on-call system and the provision of care in its community-based outpatient clinics. As the largest integrated health care

system in the country, the VA(VHA) is particularly suited to pilot projects given that its EHR system has combined billing data and patient medical data readily available. Like the nursing phone line instituted at Denver Health, the VA(VHA) is well-positioned to trial alternative models of care for these vulnerable clients.

A Culture of Continuous Improvement

Sustained operational improvement requires a change in culture, which underlines another key characteristic of the successes we have had. An additional common differentiator from many others is our strong commitment to use measurement, feedback, and iterative improvement. In spite of many measurement activities occurring in health care facilities today, there remains a surprising lack of meaningful data to support strategic change. It is notable that our organizations employed an individual or group dedicated to reviewing data, which is particularly relevant early in a change process. The use of data to make decisions is essential to ensuring that changes are not political or anecdotal but rather evidence based. Allowing data to drive change, rather than hierarchy or special interests, revealed inefficiencies in our systems, and paved the way for ongoing revision of processes as well as the trial of new ones. This is a different culture from that in many health care settings, where efficiency is defined by adherence to current processes, whether they are truly functional or not.

As in other industries, another common element used by our organizations is the importance of pilots. Earlier models of introducing new processes or systems without localized trials or iterative change are apt to be unproductive. Rather, staged efforts involving one highly motivated group involved in continuous improvement that could be later changed and scaled as the new model moving forward were more likely to be successful.

Leadership as a Precondition

Each of us has also had reinforced to us on many occasions that sustained and visible leadership from the top is key—much more important than our resources or role in the health care marketplace. It is our commitment to consistent excellence in leadership. Many of the strategies used in our organizations are not unique, and many of our initial trials have been unsuccessful; however, it is the leadership throughout the organization that sets these organizations apart from others that have faltered. There is a general belief that board, administrative, physician, and nursing leadership is key to care redesign, requiring a shared commitment to providing a high-value patient experience. Rather than forcing new efforts, each phase of the redesign began with the stakeholders most directly affected by the change, as a peer-reviewed innovation effort. While commitment at the top is essential, success stems from frontline staff and patients to improve processes that demonstrate respect for people and improve acceptance, accountable, and outcomes. Our journeys involved both personal and organizational learning to improve our capability to improve access, simplify scheduling, and decrease waits.

We hold a shared belief in the prospect for a systems perspective to yield high-quality, high-value experiences for patients. The commonality of approaches—a systemwide view, the use of a disciplined approach such as Lean, and the respect for people—are the building blocks for improving the access to and the scheduling of health care. The simple awareness of the need to change, along with the personal and organizational commitment in learning how to change, distinguishes both the individuals and the systems as providers of the highest-quality care. We look forward to continue to learn and change, along with others throughout the nation.

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