

Patient Throughput: A Critical Strategy for Success

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In a hospital environment characterized by increasing patient demand, constrained physical resources and a rising cost of capital, optimizing inpatient throughput (the cycling of patients through a hospital's physical resource base) is an essential operations management strategy. It ensures efficient use of a provider's capital and facilitates a superior Return on Assets (ROA). Optimized inpatient throughput has increased effective bed capacity by 5 – 12%, providing both significant capital investment savings and revenue growth opportunities. In addition, optimized inpatient throughput enhances patient access, reduces unit cost, and improves service levels. Patients have experienced drops in wait times for admission of 35 – 50% and providers have achieved unit cost reductions of 5 – 7%. The purpose of this white paper is to introduce the potential benefits of optimizing inpatient throughput and the processes necessary to achieve them.

The Challenge: Strained Capacity, Pressured Return on Assets, and Potential Growth Constrained by Limited Access

As providers face growing inpatient capacity utilization challenges and Return on Asset (ROA) pressures, optimizing inpatient throughput—cycling patients through a hospital's fixed resources (beds, procedure rooms, imaging) more effectively and efficiently—is an essential operations management strategy.

Strained Capacity: Over the next 5 years, with the continued aging of the U.S. population and accelerated clinical technology advances, demand for inpatient bed capacity is projected to rise by nearly 4% per year. Overall, new bed capacity need is projected to climb 20% by 2012.^{1, 2, 3} This growth in bed capacity will also require capacity growth in hospital support areas such as procedural suites, operating rooms, and imaging. These projections do not take into account the concurrent and additional requirement that many providers have for replacement beds. In California, 47% of the hospital beds (over 44,000 beds) were identified recently as needing to be retrofitted, replaced, or removed from service in order to meet seismic safety regulations.⁴ In a recent study of 12 different community markets in the U.S., 76% of the hospitals surveyed were engaged in construction projects to expand capacity and 56% of the hospitals were building new or expanding existing capacity in specialty areas.⁵ *A provider's ability to increase its*

inpatient throughput effectively and efficiently will reduce the need for new and replacement beds.

Pressured Return on Assets: For most U.S. providers, the need for enhanced Return on Assets (ROA) is significant and will only increase as operating cost growth continues in the face of constrained reimbursement, resulting in decreasing ROA, net income and a higher future cost of capital. Those providers considering constructing new beds face even greater ROA hurdles because construction costs have been rising nearly 7% annually and the average construction cost for new hospital beds in many markets now exceeds \$1M per bed.^{6, 7} *To materially increase ROA, providers must find an effective means of improving inpatient throughput in order to increase inpatient discharges and revenue per bed.*

Limited Access: Many institutions experience the additional challenge of finding their volume growth strategies constrained by an inability to ensure physicians that they can admit their patients in a timely fashion. Lack of available beds and poorly executed intake, bed management, and patient placement processes result in excessive wait times and ED diversions both of which can cause physicians to admit patients elsewhere. *Improving inpatient throughput can substantially decrease admission wait times and create pre-defined elective patient fast tracks from the physician's office.*

Addressing Inpatient Throughput

There are three key success factors to fundamentally improving and sustaining inpatient throughput:

1. Start with a “systems” understanding and approach
2. Actively manage bed supply and patient demand
3. Establish organizational alignment around institutional throughput objectives

1. Optimizing Inpatient Throughput Requires a Systems Approach. Providers that have successfully addressed the challenges of improving inpatient throughput understand that it must be approached as a continuum of interrelated processes with multiple connections and interdependencies. In our experience, a “systems” perspective is essential to meaningfully defining and addressing inpatient throughput. The process of optimizing inpatient throughput must encompass all the patient flow processes from preadmission through discharge; these processes include patient intake, bed management and patient placement, care management, scheduling and delivery of diagnostic and therapeutic interventions, discharge planning, and the underlying bidirectional communication inherent across all inpatient processes. These processes are illustrated in Figure 1 below.

This overarching framework is comprehensive and takes into account all expected and unexpected impacts of adapting individual elements of the throughput process. Without such a disciplined view of the processes, improvement efforts can result in little net gain and

potentially greater inefficiency if they change parts of the “system” that impact other parts of the system in unplanned ways. Understanding these interdependencies is critical to achieving optimal efficiency. For example, the benefits of more efficient intake of ED patients will be diminished by lack of an effective process for bed assignment or poor care coordination on the inpatient units. Any potential financial benefit could be offset by increased nursing overtime on patient care units trying to accommodate unanticipated or unplanned bed turnover and demand. Additionally, patients may still experience delays and fragmented care throughout their hospitalization and discharge because other key elements of effective throughput—patient placement, coordination of care and other support processes—have not been addressed.

2. Inpatient Throughput Optimization is about Supply and Demand. For many organizations, optimizing inpatient throughput requires executing against two dimensions:

- a. Optimizing the supply of open beds to ensure there are as many beds available as possible during peak demand period.
- b. Optimizing the level and timing of demand for beds so that patient demand better meets available supply.

Bed Supply Optimization

A myriad of factors affect the number of beds a hospital has available on any given day. The number of available beds can be constrained by:

- Unaligned schedules for bed and facilities maintenance, nursing units, and off-site physicians;
- Implications of isolation or gender constraints for shared room patient placement, and PACU management; and,
- Standby practices and requirements.

While reality dictates that every hospital will always have some number of available beds offline due to these factors, for most there is ample room for improvement. This is increasingly true when taking into account process inefficiencies such as poor

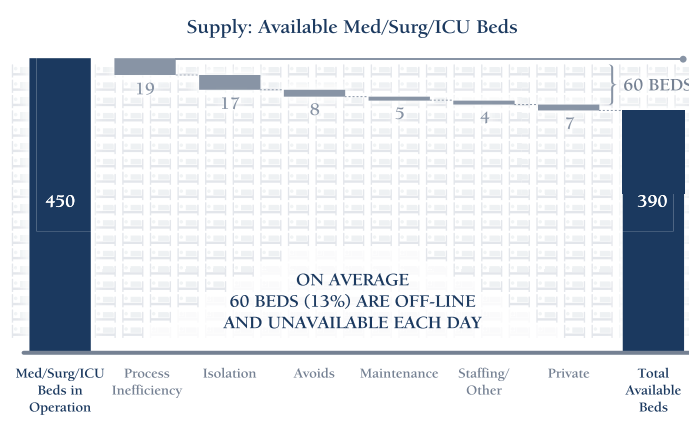
figure 1. SYSTEMS APPROACH FRAMEWORK FOR INPATIENT THROUGHPUT



discharge communication between departments, room turnaround and transport issues, and the timing of physician discharge rounds and the discharge process. Any such process breakdowns contribute to unidentified, unattended, and underutilized available beds.

For one Midwestern academic medical center, existing bed management practices resulted in 13% of available beds being offline at any given time. This scenario is illustrated in Figure 2 below:

figure 2. CAPACITY MANAGEMENT: SUPPLY



After redefining its bed management processes and redesigning its approach to patient placement and bed turnaround, the institution was able to increase its available bed capacity by 45 beds per day. And as the number of available beds grew, the organization had the unique opportunity to reorient the newly available beds to support its growth priorities.

Optimal Management of Demand

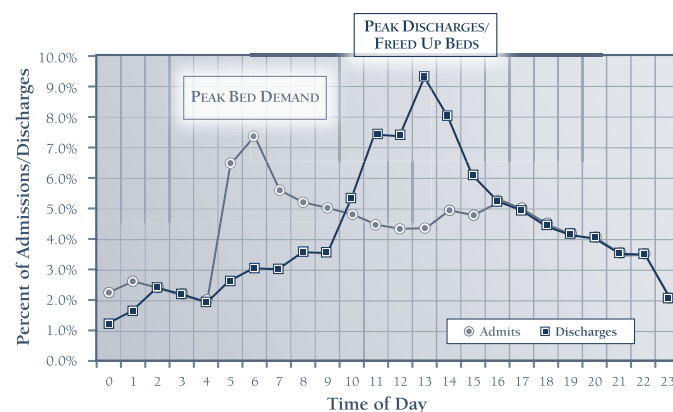
Effective demand management can substantially improve inpatient throughput. There are five key processes to address that affect the management of demand for beds:

- **Centralized Bed Management and Patient Placement** – The processes by which all requests for beds and the supply of available beds are managed by a single function. This function should integrate with case management and have an organization-wide viewpoint to facilitate the admission, discharge and transfer of all patients using the current, agreed upon clinical and service criteria.

- **Coordination of Care** – The organization of the many interactions and communications required during a patient's stay to deliver care, as well as the processes that accelerate discharge and the fulfillment of post acute care requirements.
- **Demand Predictability and Smoothing** – The identification of consistent patterns and subsequent planning for urgent and emergent admissions, and the modification of elective procedure schedules to match staff and bed availability.
- **Support Processes** – The processes that are critical for efficient movement of patients throughout their course of treatment such as patient transport, bed turnaround, registration, etc.
- **Technology Enablers** – The systems that enhance communication and provide information about all steps and points in the process.

Enhancing processes such as intake management and patient placement can reduce ED patient wait times by 30% and admission wait times by greater than 50%.⁸ Developing care management processes and proactively managing discharge planning, discharge rounding and the ultimate discharge itself can materially reduce patient length of stay. Figure 3 below demonstrates that for one hospital, reducing LOS by 6 hours would dramatically increase the availability of beds to meet the institution's early-in-day patient bed demand.

figure 3. MISALIGNED DEMAND TIMING



3. Achieving Material Inpatient Throughput Improvement Requires Organizational Alignment.

A powerful inpatient throughput improvement program requires organizational alignment around:

- A shared vision of the optimal outcomes and how they are measured
- Collective and individual goals and metrics that are cohesive and synchronized to achieve those outcomes
- A common framework for prioritization and decision making
- Underlying hospital and physician economics, and
- Accountability for outcomes and authority to make process critical decisions

Such alignment can be strengthened through a number of structural and process enhancements including:

The establishment of a common inpatient throughput agenda shared by clinical, operational and physician leadership. Such an agenda includes defined, shared objectives, metrics which gauge performance against those objectives, job descriptions and job performance evaluation criteria, and performance based economic incentives and consequences.

Establishment of a leadership led process to review and refine access, throughput and bed management processes and policies in order to clarify prioritization of patients and management of beds, especially during periods of high census and competing demand. In many cases, the "ownership" of beds is transferred from individual patient care units to a centralized bed management department and the department reports directly to a C-level executive, often the COO or CMO, to ensure organizational values and accountability are maintained.

The augmentation of roles and personnel to facilitate throughput. Examples include the addition of hospitalist coverage and the introduction of an "unassigned" day shift charge nurse role—a unit based nurse without a patient

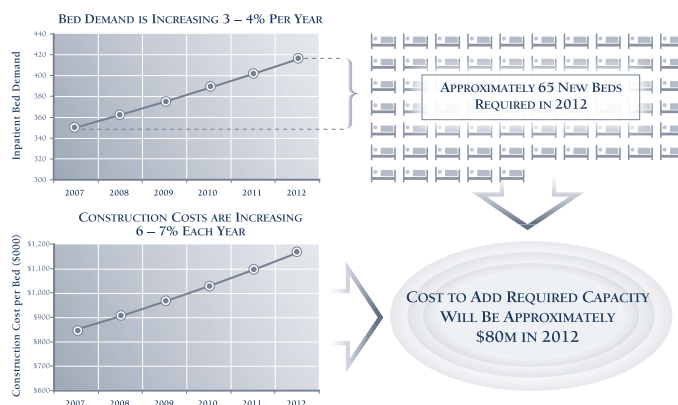
care assignment—to facilitate patient throughput activity as process improvements lead to greater intake and discharge activity during peak clinical care hours.

The Benefits of Improved Inpatient Throughput are Substantial

The benefits of improving inpatient throughput can be substantial for hospitals and academic medical centers—both in terms of enabling the most efficient use of capital and facilitating improved financial, clinical, and service operating performance.

Efficient Use of Capital: Figure 4 illustrates the future bed capacity requirements of a 350 bed hospital that is running near capacity. Absent throughput enhancements, this hospital will need 60 to 70 more beds in the next 5 years, at a cost of at least \$80 million.

figure 4. CAPACITY CHALLENGES FACING A 350 BED HOSPITAL



By focusing on improving throughput and making better use of existing capacity, hospitals can offset some of the cost of such an expansion. For example, organizations that have effectively focused upon improving admission throughput have increased available capacity by 5 – 12% without adding any additional beds. An improvement of this magnitude increases the effective capacity of a 350 bed hospital by approximately 30 beds, thereby avoiding approximately \$34 million in capital to build them.

An additional benefit from increasing inpatient throughput is that the enhanced capacity created can quickly accommodate new admissions and generate incremental revenue. With 30 additional "effective beds," the hospital can accept approximately 1,750 additional admissions per year, generating annual additional net income of over \$14 million, or more than \$56 million over four years (see Figure 5).⁹

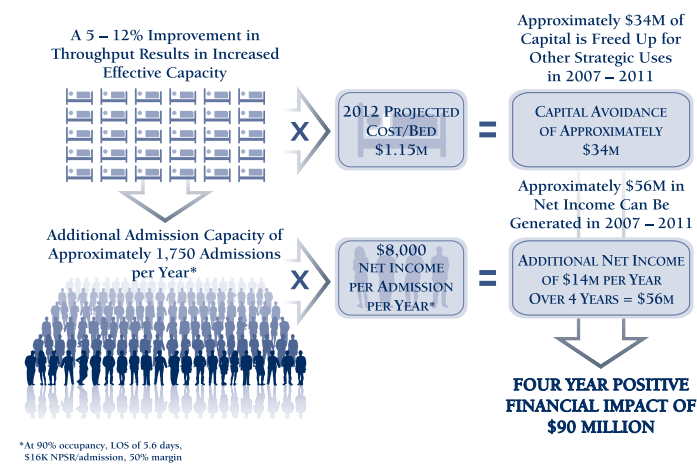
Increased Return on Assets: Organizations that have enhanced their inpatient throughput and capacity have experienced 5% – 12% increases in their discharges per available bed. One Midwestern academic medical center saw its annual discharges per bed increase 12% from 43 to 48 and its annual net revenue per bed increase over \$60,000.¹⁰

Improved Operating Performance: In addition to more efficient use of capital and increased Return on Assets, enhanced throughput results in key operating performance improvements that can facilitate institutional volume growth. Many organizations have seen dramatic reductions in patient wait times, ED diversions, and physician admission splitting. One mid-Atlantic teaching hospital achieved a 61% decrease in bed turnover time from 3 hours and 25 minutes to 80 minutes resulting in a 9% reduction in lost direct admissions, a decrease of ED time on diversion from 10% to 3%, and an overall volume increase of 8%.¹¹

Conclusion:

For most organizations, the importance of growing revenue and volume and maintaining sufficient capacity in the face of growing cost of capital, will make actively optimizing inpatient throughput a central institutional priority. Doing it well will not be easy. Incorporating a "systems" understanding, an informed supply and demand approach, and an organizational commitment to alignment and outcomes will be essential. And if executed effectively, the rewards will be tremendous.

figure 5. FINANCIAL BENEFITS FOR A 350 BED HOSPITAL



Sources

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- ⁶ Modern Healthcare 2006 Construction and Design Survey, 2006 – 7 Modern Healthcare By the Numbers.
- ⁷ Health Care Construction Cost Comparison 2006 vs. 2007, as published in Health Facilities Management Magazine.
- ⁸ Chartis client experience.
- ⁹ Assuming only marginal cost increases to care for these new patients.
- ¹⁰ Chartis client experience.
- ¹¹ Ibid.

About The Chartis Group

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