IMPROVING PATIENT THROUGHPUT: GROWING ORGANIZATIONAL CAPACITY THROUGH PROJECT MANAGEMENT AND PROCESS IMPROVEMENT

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Challenge/Background

America’s hospitals are reporting demand for inpatient services growing at a rate not seen in well over a decade. Beds are full, emergency departments are on divert and staff is in short supply. This change in the economics of hospital care has been swift, catching most of the industry off guard. Hospitals have exited an era of surplus and entered a period of prolonged and chronic shortage. Lehigh Valley Hospital was not immune. In 2000 and 2001, we saw ambulance diversions increasing, excessive waits in the emergency department, Transfer Center patients turned away, operating rooms (ORs) put on hold and daily patient logistic challenges. Physician and patient satisfaction suffered. We knew we did not have the physical and human capacity currently to maintain access in the face of rising and uneven patient demand. However, we believed through process improvement we could help the situation. To eliminate frustrating delays and provide a higher level of service to all seeking our care, we launched our Growing Organizational Capacity (GOC) project in July 2002. The project goal was:

“By December 2003, design and implement improvements to ensure open access to meet or exceed the forecasted volumes over 5 years (FY03-FY08)”

The Global Objective was “to maximize throughput and create open access by focusing on the post-encounter, encounter and pre-encounter phases of hospitalization to meet capacity needs of the organization.” Focus was placed on developing and enhancing Processes, People and Physical Space, using our internal resources to manage and execute the project.

The GOC project grew out of several previous projects which were designed to fix ED patient flow problems. In 2000-2001, "Clockwork ED" focused on enhancing ED processes to reduce the length of ED patient visits. There was some success; however, ED patients’ LOS remained high, resulting in ED backlog, due to the inability to move patients to a hospital bed in a timely fashion. In June 2002, a middle-management retreat was held and ideas were generated as potential solutions to fix capacity and patient throughput problems. The newly formed GOC task force reviewed and prioritized the over 1,000 ideas generated at this retreat.

Project Development

The GOC project formally commenced in September 2002 with 10 sub-projects initiated to speed up the process of patient discharge and bed “turnover” (cleaning, readying for next patient). Much of GOC’s success has been due to organizational support it has received.
from our hospital’s senior administrative and clinical leadership. The project sponsors included the Chief Operating Officer, President of the Medical Staff and Chair of Medicine have served as our champions; communicating with peers about the challenges and helping eliminate barriers. The project leaders, Senior Vice President, Clinical Services; Vice-Chair of Emergency Medicine and Vice President, Operations, have managed the identification, execution and implementation of the sub-projects. A large, dynamic interdisciplinary group of physicians, mid-level managers and staff, literally hundreds of employees, was engaged to develop and participate in the solutions.

The GOC Project was executed in two phases, each lasting about 12 months in length. The sub-projects were carefully selected to impact the total patient flow process. Leaders and team members were selected to offer both functional and “outside” views of the sub-project charter. The GOC project structure created the formation of two teams to help in the identification, execution and implementation of the sub-projects; GOC Implementation Team and GOC Resource and Development Team. The GOC Implementation Team included the GOC Project Leaders, current GOC Sub-project team leaders, at-large members with functional responsibility in targeted areas and selected GOC Resource and Development members on an as needed basis. The GOC Resource and Development Team consisted of some of the wealth of internal resources at LVH including; Management Engineering, Organization Development, Care Management, Information Services, Center for Educational Services and Marketing. The GOC Resource and Development Manager served as the GOC Project Manager, an innovative role connecting project sponsorship, leadership and resources for streamlined communication.

The first 10 sub-projects, that kicked off in the Fall of 2002, were completed by Summer of 2003 and included:

**Discharge Process** (focus on the physician communication and nursing unit staff process of patient discharge)
**Transport Mechanics for Discharge** (use of centralized Patient Transport for patient discharge)
**External Transport -- Centralized Ambulance** (develop centralized ambulance function for expedient movement of patients to other care facilities)
**Discharge Bed Turnaround Time** (focus on the communication and process of “dirty” bed cleaning)
**Bed Tracking Software** (implementation of bed tracking software for the cleaning of “dirty” beds and the reporting of clean beds)
**Intra-Hospital Transfers** (enhance process and communication of the transfer of patient within the hospital)
**Short Stay Hospital Implementation** (implement a short stay unit for 1 and 2 day stay patients from Ambulatory Surgical Unit)
**Find-a-Bed Implementation** (“opening” licensed beds not in use)
**Expanded Express Admissions Unit Feasibility** (determine the feasibility of the expansion of the Express Admissions Unit pilot)
**Observation Unit Feasibility** (determine the feasibility of the operation of a universal unit for observation patients)
The second phase which began in Fall 2003 and continued until Summer 2004, included the following sub-projects:

**Ancillary Services Feasibility** (determine the feasibility of expanding ancillary services’ hours for patient discharge facilitation)

**Patient Logistics Implementation** (implementation of 6 of the above projects into a new department called Patient Logistics)

**Pull System** (development and implementation of a “pull” system for patient admission and transfer)

**Surgical Smoothing Feasibility** (feasibility study of identifying opportunities to “smooth” the flow of patients in and out of surgical areas)

**Timely Discharge** (increase number of patient discharged by 11:00AM)

**SOS – Shorten Our Stay** (identify LOS reduction opportunities in long LOS patients)

**ED LOS Reduction** (design ED process improvements to reduce ED LOS)

A unique outcome of the first phase of GOC was the idea of “stitching” six interrelated sub-projects into one recommendation for implementation. A workout session was held with the six sub-project leaders, functional area management and the GOC Resource and Development Team. The group worked on process development, implementation strategies and cost/benefit analyses to ensure the success of the solutions. The result was the formation of our Patient Logistics department.

**Solutions/Results**

Implemented over the past year, these sub-projects have had a significant effect on throughput, capacity and customer satisfaction. The successes include:

1) Patient Logistics department implementation. The patient logistics function began in April 2003 and was implemented over six months. Patient Logistics oversees each step of patient throughput from admission to discharge and consists of the former bed management activities and now includes: Centralized Patient Transport, Discharge Bed SWAT team, Patient Flow Coordinators and Centralized Ambulance Transport. Teletracking’s TransportTracking, BedTracking and PreAdmitTracking software packages were installed and implemented. This has resulted in reducing bed turnover time (bed dirty to bed clean) from 210 minutes to around 60 minutes. Consistent patient transport times of 24 minutes per trip, better communication of the need and availability of beds for patients.

2) A seven-bed Express Admissions Unit (EAU) now accounts for more than 50 percent of all direct admissions to the hospital, improving physician and patient satisfaction. The EAU allows direct admissions to completely bypass the ED and give fast patient care, including medication administration, diagnostic testing and admissions paperwork completion, on arrival.
3) In the 12-bed short stay hospital medically stable elective surgery patients spend one or two nights, freeing up the main ORs for more complicated cases, emergencies and traumas.
4) Find-a-Bed reviewed the current bed complement and allowed us to put 37 new beds in service.
5) The Short Stay Hospital Unit opened in April 2003 and caters to patients undergoing elective procedures who require a one to two day length of stay. Located in the same facility as our ambulatory surgery unit, this unit has helped us deal with our capacity issues by shifting select cases from our primary site to an alternate location. Helping us to manage a 12% growth in surgical cases, this unit has been well-received by both patients and physicians in meeting their needs.
6) Patient Flow Coordinators (PFCs) were created to facilitate the movement of patients throughout the hospital system. Patient flow coordinators ensure that patients from the ED, PACU and EAU are promptly transferred to assigned ready beds. In addition, as RN’s, they problem-solve patient placement issues and provide hands-on clinical assistance as needed.
7) A pull system was developed and implemented in the patient admission process. Patients to be admitted from the ED, EAU and PACU are now “pulled” their assigned unit, through changes in the admitting process. These changes include a new electronic nursing report and the use of PreAdmit Tracking to set signals (or kanbans) for nursing units when a patient is ready to be moved. This has resulted in a 33% reduction in the time it takes for a patient to occupy a clean bed.
8) There are now more ancillary services hours on the weekend with physician coverage. This has facilitated more weekend patient discharges, “freeing” up beds for surgical admissions early in the week.
9) The ED has implemented process changes that have decreased the LOS by over 15%. Two of the process changes with significant impact are the Lines and Alerts and Bedside Registration.

Summary

The overall result is that we have kept the access to LVH open to the community. We attained a 5.9% admissions growth (exceeding forecasted volumes) from FY2003 to FY2004 breaking record monthly admissions along the way. ED visit volume continues to grow, despite the “off-loading” of patients through the EAU. Transfer Center requests have increased 120% and Transfer Center acceptances have increased by 150%. The many successes of GOC have resulted in a fantastic, highly profitable FY2004 for LVH. In addition, Press Ganey scores in most areas are rising to their highest levels ever. These integrated, positive results have positioned LVH to prepare for capacity expansion and increased technology, resulting in better, more efficient patient care of the greater Lehigh Valley community.

The success of GOC is attributed to the organizational involvement of the staff at LVH, strong positive project management, increased technology, focus on capacity/demand measurement and implementation of enhanced processes surrounding patient throughput. A project structure is being developed to address current and future capacity issues, by monitoring...
capacity/demand metrics via a dashboard, performing process audits to ensure the process change and identifying the next “capacity thing.”
Improving Patient Throughput: Growing Organizational Capacity through Project Management and Process Improvement

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Lehigh Valley Hospital and Health Network
LVHHN was experiencing unprecedented levels of rising community demand which challenged our ability to optimally care for our community. Lost admissions due to:

- Emergency Department (ED) diversions
- Transfer Center denials
- Operating Room (OR) holds,
- Extended ED wait times
- Daily patient logistic challenges related to “thru-put”
Growing Organizational Capacity - GOC

- 2000-2001 Clockwork ED
- 2001 Clockwork LVH
- June 2002 Circling to Land: Leadership Retreat
- Sept 2002 GOC commenced
  - Structure
  - Focus
    - Post-Encounter
    - Encounter
    - Pre-Encounter
GOC Project Goal

"By June 2004, design and implement improvements to ensure open access to meet or exceed the forecast volumes over 5 years (FY’03-FY’08)"

- Three Capacity P’s
  - People
  - Process
  - Physical space
- Internal capability development
LVH GROWING ORGANIZATIONAL CAPACITY PROJECT STRUCTURE

GOC Project Monitored Projects

Authority for Implementation in functional area

GOC Implementation Team
- GOC Leaders
- GOC Sub-Project Leaders
- At-Large Members
- GOC Resource & Development Team Members

GOC Project
- Division Chief
- GOC Sponsors
- COO
- Medical Chief
- VP, Operations
- GOC Leaders
- VP, Nursing
- Vice-Chair ED

GOC Sub-Project Leaders
- Ancillary Services Enhancement Feasibility
- LOS Reductions to Improve Throughput and Capacity Implementation
- Patient Logistics Implementation
- ED LOS Reduction
- Pull System Implementation
- Discharge Education Campaign
- Smoothing System Feasibility

GOC Resource and Development Team
- Management Engineering, Organizational Development, Care Management
- Marketing, I/S, CEDS
GOC Sub-Projects

Discharge Process
Transport Mechanics for Discharge
External Transport (Centralized Ambulance)
Discharge Bed Turnaround Time (D’BST)
Bed Tracking Software
Intra-Hospital Transfers
17th Short Stay Hospital Implementation
Find-a-Bed Implementation

Expanded EAU Feasibility
Observation Unit Feasibility
Ancillary Services Feasibility
Patient Logistics Implementation
Pull System
Surgical Smoothing Feasibility
Timely Discharge
SOS (Shorten Our patients’ Stays)
ED LOS Reduction
6 subprojects were “stitched” together

- Supported the creation of Patient Logistics
  - Automated Patient Transport Software for discharges
  - Centralized bed cleaning (software)
  - Patient Flow Coordinators
  - Centralized Ambulance Transport
  - Discharge Process
  - Intra-Hospital Transfer
Patient Logistics Functional/Operational Structure

- DBST
- In-patient Registration
- In-patient Bed Assignment
- Patient Transport
- Transfer Center
- Ambulance Transport
- PFC
- Mini Electronic Bedboards
- Clinical Services
- Case Management
- Decedent Affairs
LVH-CC “Bed Swat Team”

LVH-CC DBST Bed Turnaround Time
Dirty to Clean

Goal: 60 minutes

May 2003 Implementation
LVH Pull System

- Design and implement a “Pull System” for admitting patients
- Demand for inpatient bed is anticipated by unit staff
- Kanbans or signals sent via Electronic Bed Board
LVH-CC Pull System  ED Admissions
Clean Bed to Patient Occupy Time

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Threshold: 80
Target: 90
Maximum: 120

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LVH-CC ED Length of Stay

LVH-CC ED LOS Trend (FY02-FY05)
LVH-CC ED Door-to-Seen Trend (FY02-FY05)

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Variable Actual Fits
LVH-CC  ED Diversion

LVH-CC  ED Diversion Trend

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Bed Availability
LVH-CC Bed Availability - Discharges plus Bed TAT by Hour of Day

Take Away: GOC supported a shift in the capacity curve to earlier in the day; there are six more beds available at noon. LVH-M showed a similar capacity shift; yielding two more beds available at noon.
GOC Success

LVH-CC Effective Occupancy

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Fiscal Year Quarter:
- FY02Q1
- FY02Q2
- FY02Q3
- FY02Q4
- FY03Q1
- FY03Q2
- FY03Q3
- FY03Q4
- FY04Q1
- FY04Q2
- FY04Q3
- FY04Q4

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LVH Admissions ... Higher and Higher

Take Away: We have exceeded admissions budget and forecast in FY03 and FY04.
CC ED PressGaney Improvements FY’04 1Q - 3Q

Overall Rating
77.9 to 83.9 (30% tile - 85% tile)

Overall Assessment
74.7 to 83.7 (25% tile - 85% tile)

Arrival
70.5 to 76.8 (20% tile - 60% tile)

Nurses
81.1 to 86.1 (35% tile - 85% tile)

Doctors & PAs
83.0 to 89.8 (55% tile - 97% tile)

Patients & Families
74.7 to 83.7 (25% tile - 85% tile)

Personal Issues
69.8 to 78.4 (20% tile - 83% tile)

Personal/Insur. Info.
83.2 to 87.0 (35% tile - 77% tile)

Family/Friends
82.7 to 86.2 (45% tile - 77% tile)

Tests
82.6 to 85.0 (40% tile - 70% tile)
GOC Next Steps

- Capacity Oversight Transition Team formed
  - Audit process changes
  - Monitor the processes (data)
  - Make recommendations for future capacity subprojects
GOC Success

- High Level Organizational Support
- Committed Staff
- Internal Resources
- Use of Technology