



**BestPractices**  
LEADERS IN EMERGENCY MEDICINE

# PRESENTS:



## **Better Patient Flow**

The Key to High Quality,  
a Good Patient Experience,  
and Pay-for-Performance Success

## Featuring:

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CEO, BestPractices

Executive Vice President, EmCare

Medical Director, Studer Group

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Medical Director, Studer Group

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CEO, EmCare® InPatient Services™

# The Dynamic Tension of Flow

**WHY?**

**WHY NOT?**



Why are we doing it THIS way?

EXECUTION  
VALUE ADDED

Why not do it THAT way?

AGILITY  
WASTE REDUCTION

# VISION

Creating a New Future for Healthcare Through:

1. • The Science of Clinical Excellence
2. • The Art of Customer Service
3. • The Business of Execution

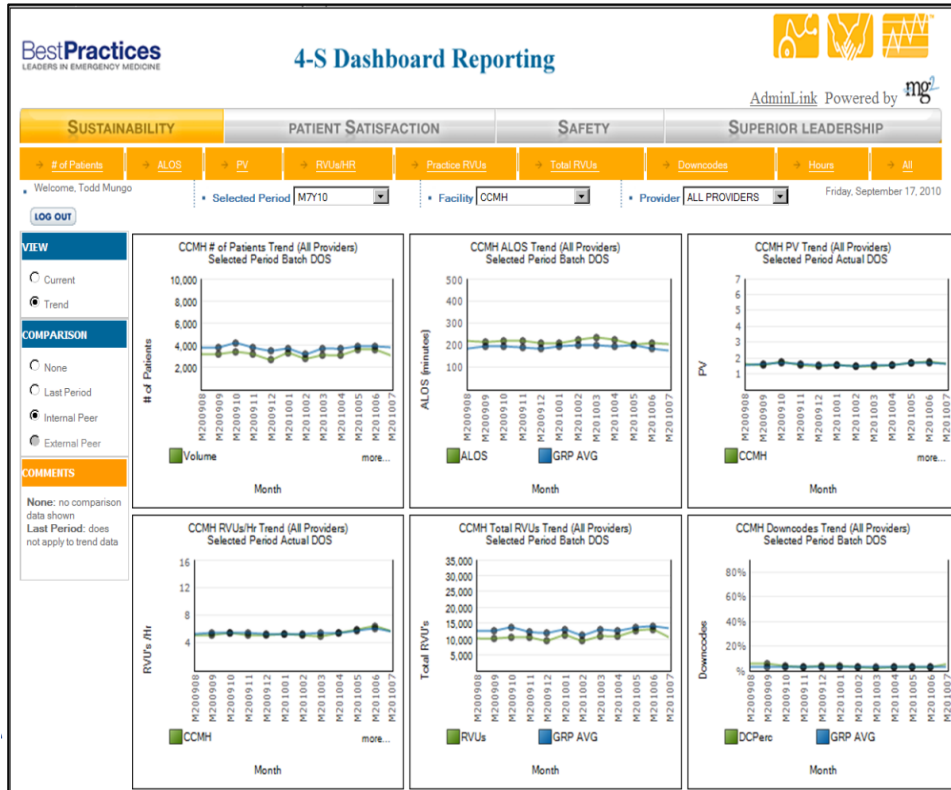
Only **LEADERSHIP** can **ENVISION** this.

Only **ALIGNED TALENT** can **EXECUTE** this.

# CULTURE OF EXECUTION

1. • **Medical Leadership**
2. • **Customer Service**
3. • **Hardwiring Flow**
4. • **Patient Safety-Risk Reduction**
5. • **Teamwork**

# Medical Leadership – The Cornerstone



## Hire the Best:

Aligning incentives – engaged and benefit from practice success

## Executive-Level Training

Industry leaders with industry – leading reputations

## Coaching and Mentoring

Good to Great Results  
Excellence is always a moving target  
Relentless innovation

# Customer Service

Best-in-Class Training Programs:  
*ED Survival Skills*

## The Key-Taking 4s to 5s

- Scripts
- “We
- “Wh
- ‘good’
- Open E
- Identif
- Elimina
- Measu
- Sign O
- Cards

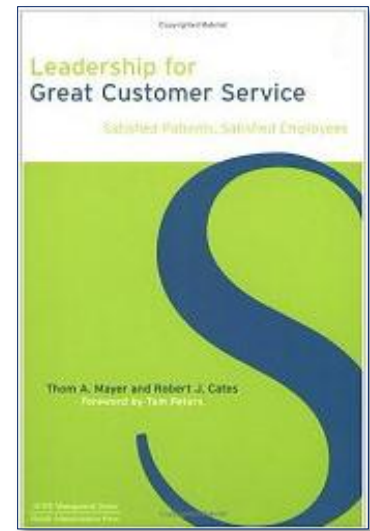
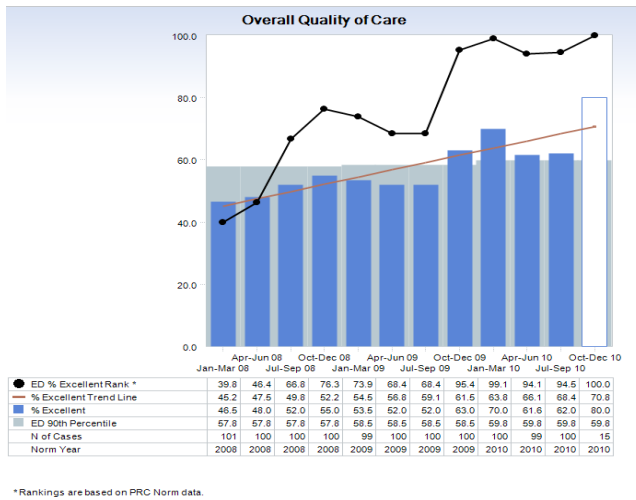
### CORPORATE RESOURCE INFO

### A-Team Toolkit

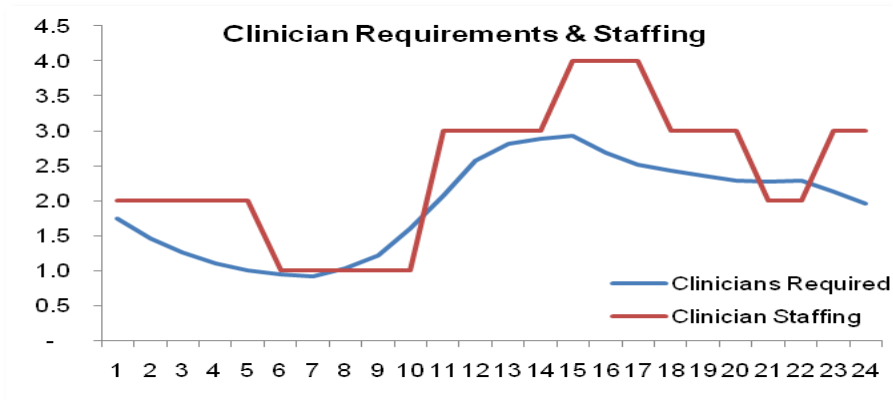
- The A-Team Toolkit Kick-off (.doc)
- Script For Success (.ppt)
- Taking the 4s to 5s (.ppt)

Individualized Patient Satisfaction Coaching

Wrote the Industry Textbook on Customer Service

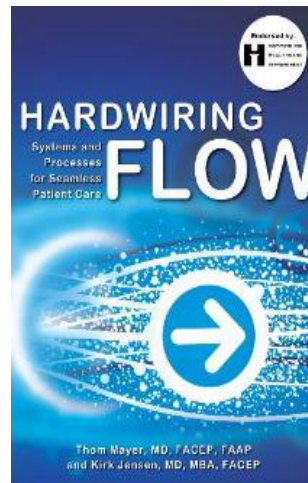
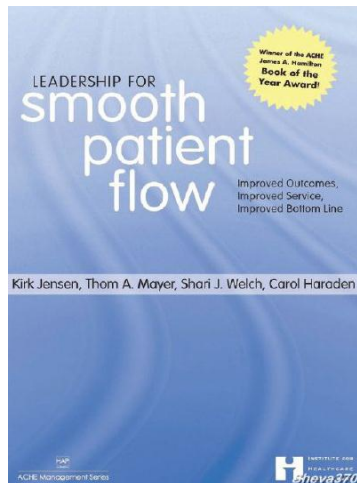


# Hardwiring Flow



*Matching Capacity to Demand*

## Predicting Admissions from the ED



Average Admits Per Shift from Emergency Department							
Shift:	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:00 to 2:59	5	8	7	6	6	6	6
3:00 to 10:59	6	7	6	6	7	6	6
11:00 to 6:59	3	3	3	3	3	3	3

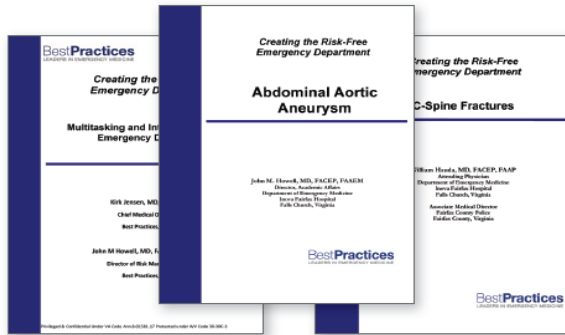
The above chart shows typical admits that will occur during each shift by day of week.

*Industry Thought Leaders on Flow*

# Patient Safety: Evidence-Based Clinical Excellence

25 Modules

Available online and eligible for CME credit



Near Miss Database

Tracking events and identifying trends

**BestPractices**  
LIVING IN EVIDENCE-BASED MEDICINE

**Near Miss DB Entry**

Please report cases that fall into one of the following two categories:  
#1 - a case that resulted in unexpected injury, illness or death, or  
#2 - a case that did not result in unexpected injury, illness or death, but had the potential to do so

Our only goal is to analyze this information to look for process issues that can make our

Instructions:  
1) Enter your name (optional)  
2) Enter the facility you work at and chart information (required)  
3) click 'Done' when finished

Please contact Kaye Wear at 703-667-3461 or kwear@best-practices.com with questions.

1. Please enter your name:

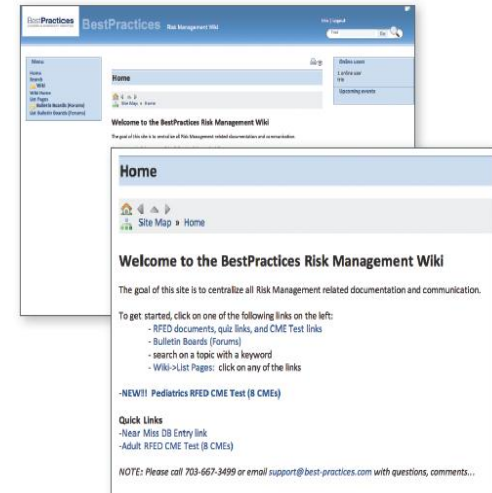
\*2. Please select the BestPractices facility where your case occurred.

- Camden Clark
- INOVA
- Northward
- Piedmont
- Wakeampton

\*3. Case #:  
DGS (jmsdyyyy)   
Account/Chart # (unique #)

Risk Wiki

An online community of BP clinicians



EMR Integration

Decision support based on evidence-based protocols

▼ EXCEEDING THE STANDARD

Consider Spinal Epidural Abscess

- Back pain with fever in patients with IVDA, immune compromise, skin infections or spinal Surgery.
- Must use MRI. CT not useful to diagnose.

For more information [Click here](#)

# Teamwork

- Partners, Not Clients
- A *LEAN* Approach to Adding Value, Eliminating Waste
- Delivering the Results that Matter
- Relentless Innovation
- Integrated Partnership Strategy
- The Emergency Medicine-Hospital Medicine Handoff

# The High Quality, Low Cost Solution

**“Think where man’s glory  
most begins and ends  
And say my glory was I had  
such friends.”**

William Butler Yeats  
“The Municipal Gallery  
Revisited”



# It's all about the **+**care

**The Physician Management Services of EMSC.**

**Your Single Source Solution.**

**EmCare®**

**AnesthesiaCare**

**RadCare®**

**EmCare**  
Inpatient Services

**Emergency Medicine.  
Customer Driven.**



**The Complete  
Anesthesia Solution.**



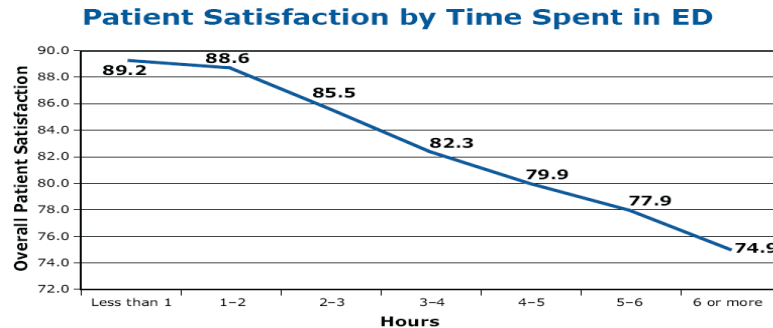
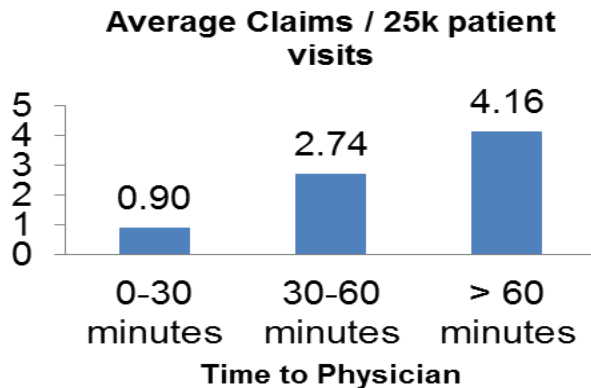
**Cost-effective.  
Accessible Technology.**



**Inpatient Solutions.  
In-depth Support.**



# Quality, Safety, and Service Have Always Been Core Drivers of Our Mission and Performance...



*Represents the experiences of 1,524,726 patients treated at 1,656 EDs nationwide between January 1 and December 31, 2007*

## Increase in patient mortality at 10 days associated with emergency department overcrowding

Drew B Richardson

MJA 2006; 184 (5): 213-216

[Introduction](#) — [Methods](#) — [Results](#) — [Discussion](#) — [Conclusions](#) —  
[Acknowledgements](#) — [Competing interests](#) — [References](#) — [Author details](#)

### Abstract

#### Objective:

To quantify any relationship between emergency department (ED) overcrowding and 10-day patient mortality.

#### Design and setting:

Retrospective stratified cohort analysis of three 48-week periods in a tertiary mixed ED in 2002–2004. Mean “occupancy” (a measure of overcrowding based on number of patients receiving treatment) was calculated for 8-hour shifts and for 12-week periods. The shifts of each type in the highest

## The Financial Impact of Ambulance Diversions and Patient Elopements

Thomas Falvo, DO, Lance Grove, RT, EMT-P, Ruth Stachura, RN, William Zirkin, MD

### Abstract

**Objectives:** Admission process delays and other throughput inefficiencies are a leading cause of emergency department (ED) overcrowding, ambulance diversion, and patient elopements. Hospital capacity constraints reduce the number of treatment beds available to provide revenue-generating patient services. The objective of this study was to develop a practical method for quantifying the revenues that are potentially lost as a result of patient elopements and ambulance diversion.

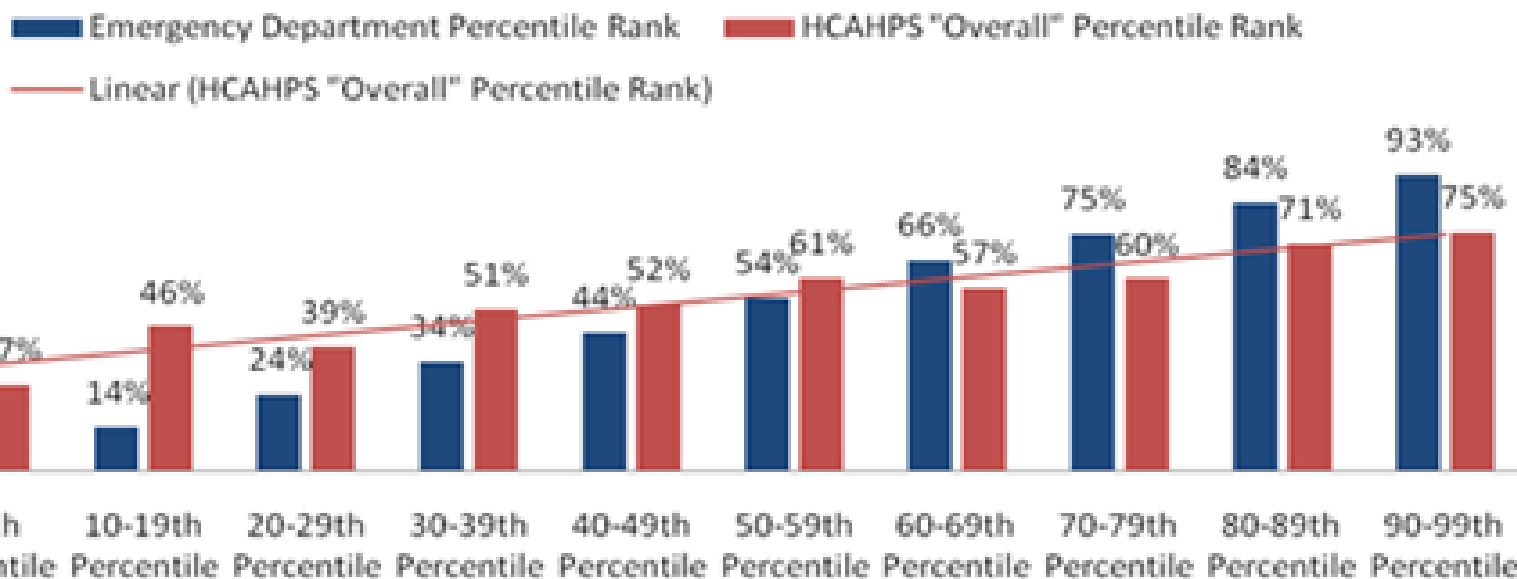
**Methods:** Historical data from 62,598 patient visits to the ED of a 450-bed nonprofit community teaching hospital in central Pennsylvania between July 2004 and June 2005 were used to estimate the value of potential patient visits foregone as a result of ambulance diversion and patients leaving the ED without treatment.

**Results:** The study hospital may have lost \$3,881,506 in net revenue as a result of ambulance diversions and patient elopements from the ED during a 12-month period.

**Conclusions:** Significant revenue may be foregone as a result of throughput delays that prevent the ED from utilizing its existing bed capacity for additional patient visits.

# Relationship: HCAHPS "Overall" and ED Percentile Rankings

## Relationship between Emergency Department Percentile Rank and HCAHPS "Overall" Percentile Rank

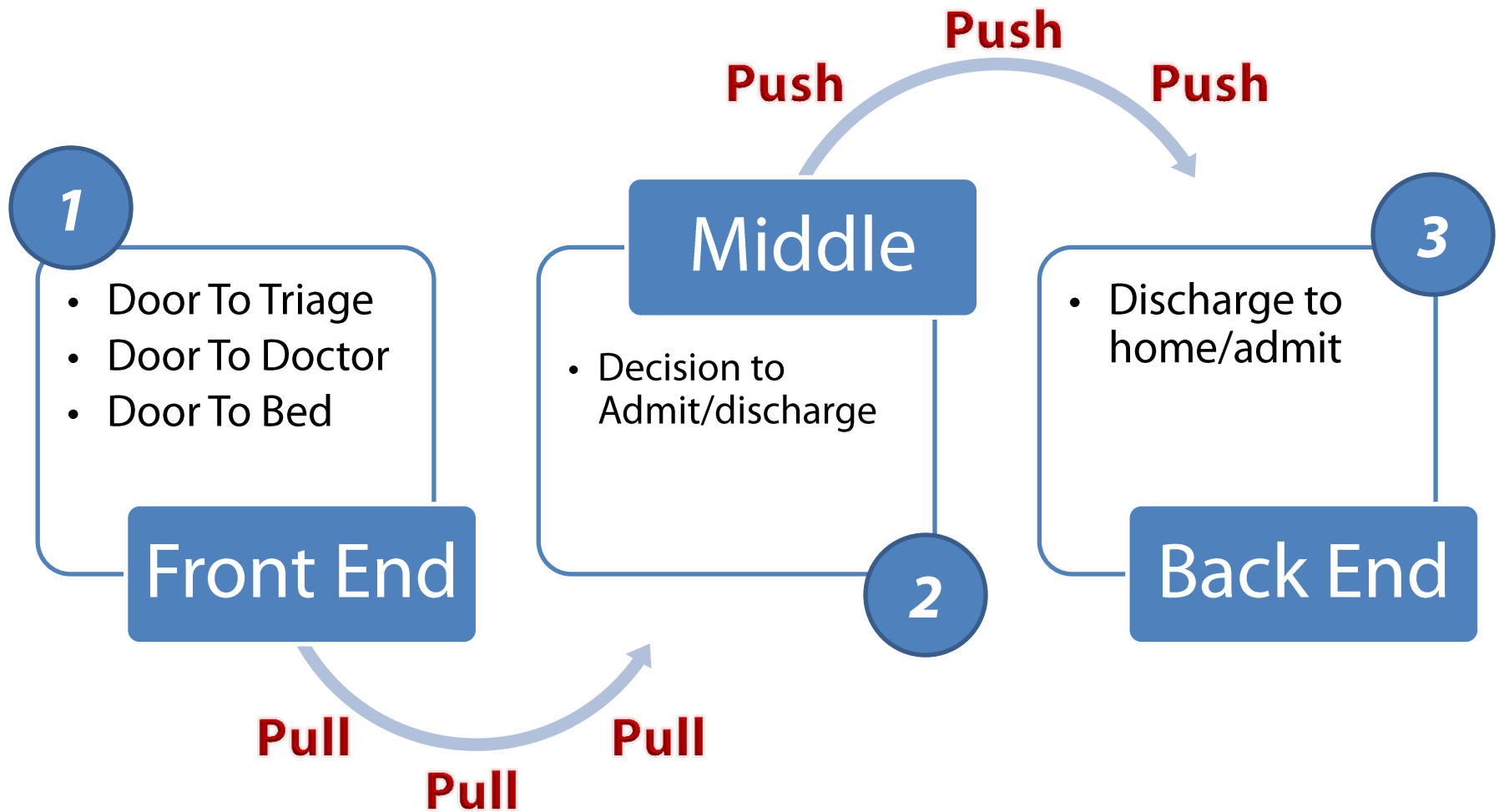


# There is an Increased Emphasis on Reportable Metrics....

- **We are measured every day on the following:**
  - Patient Flow
    - Door to Room
    - Door to Doc
    - Doc to Orders
    - Doc to Disposition
    - Total Time in the Department
  - Patient Satisfaction
  - Patient quality
    - PQRS Measures
- **There are new CMS Patient Flow Metrics for 2012:**
  - NEW! CMS Measurement: ED-1 NQF 0495  
Median time (in minutes) from ED arrival to ED departure for patients admitted to the facility from the ED.
  - NEW! CMS Measurement: ED-2 NQF 0497  
Median time (in minutes) from admit decision time to time of departure from the ED for patients admitted to inpatient status.

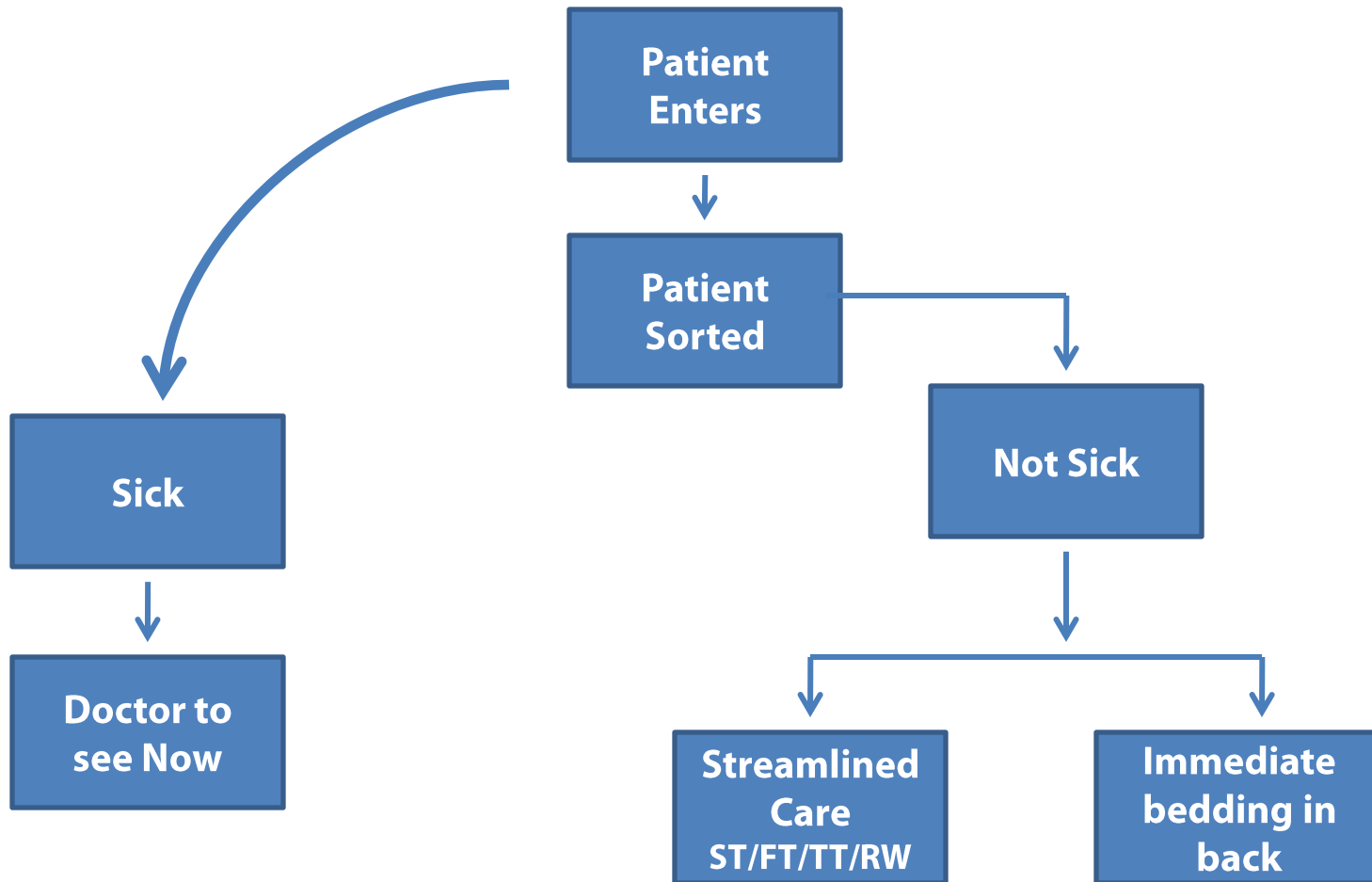
# Patient Flow and Patient Throughput

Pushing and pulling our patients through



# Emergency Department Patient Flow

Get the patient to the right place, at the right time,  
with the right treatment



# Minimize Door to Provider Time

## Sentara Potomac Emergency Department - An Example

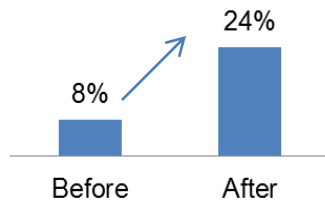
Using lean techniques and Best Practices operations models, we redesigned the patient intake model at Sentara Potomac

- A “never move backwards” approach
- Consolidated two subscale lower-acuity treatment areas into one

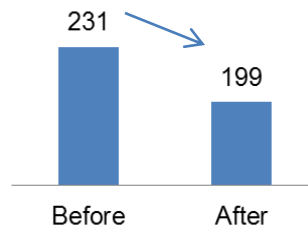
Realigned staffing with patient demand. The resulting system is able to handle more patients with improved wait times

- After rollout, nurses on the floor expressed surprise: “I never knew the waiting room could be empty”

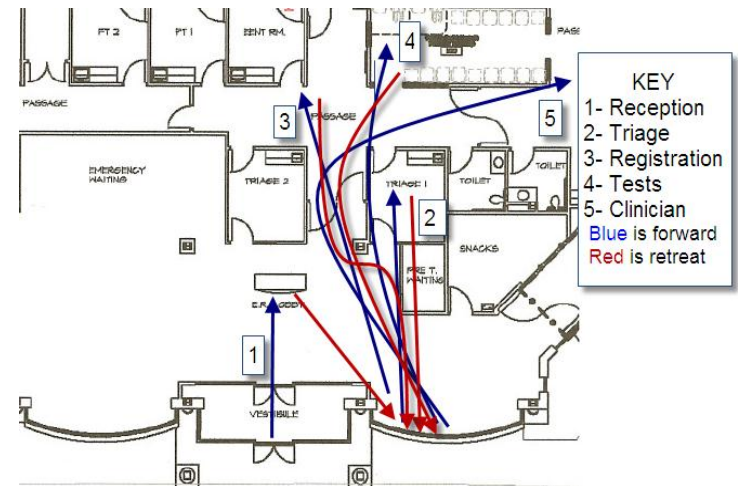
Percent of ESI 4s and 5s discharged in under 75 min



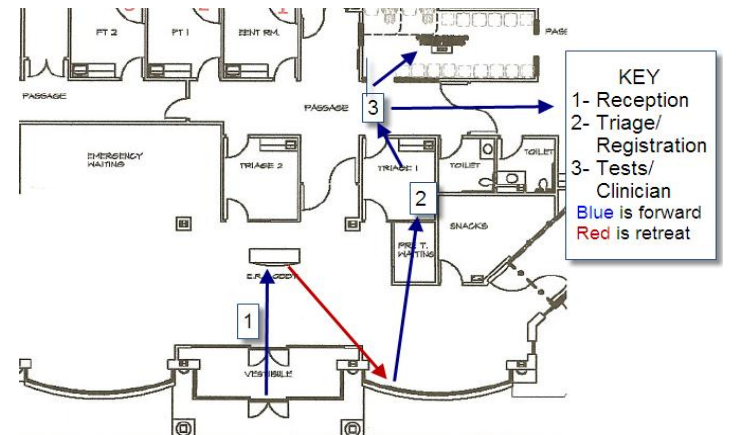
Average Discharged Length of Stay



### BEFORE



### AFTER



# Front End Patient Flow

## A Portfolio of Options in the Emergency Department

- Triage Orders/Treatment Protocols
- Super-Tracking
- Fast-Tracking
- Midlevel Provider in Triage
- MD in Triage
- Team Triage (*Multi-disciplinary assessment and treatment team*)

# Fast Track is a Process and Not a Place

- Code Blue
- Code STEMI
- Code Stroke
- Code Sepsis
- Code Vascular
- Code...

# ED Crowding and Boarders

A major consideration in ED patient flow is the number of admitted patients being held in the ED (boarders).

ED overcrowding correlates with the boarding of admitted patients more than on any other metric. (ACEP Task Force Report on boarding)

- The greater the percentage of ED beds occupied by boarders (admit-holds) the more likely flow will be impeded or obstructed
- Boarders occupy beds and consume resources that are staffed and allocated for in-coming ED patients.
- There is an extensive body of literature on the negative impact of boarders in the ED.  
(Bernstein SL. Et. Al. The effect of emergency department crowding on clinically oriented outcomes. AcadEmergMed. 16(1):1-10,2009 Jan.)
- There are a number of strategies can help decrease ED boarding and accelerate movement into and thru the hospital.



# EXPEDITING ADMISSIONS

# Expediting the Admission Experience

## Early Decision to Admit

- In most cases, an experienced emergency physician or nurse will know if a patient needs hospital admission within minutes of entering the patient's room and performing a brief assessment.
- Diagnostic testing is sometimes necessary to help select the type of bed needed (ICU, Progressive, Telemetry, Floor, or Observation).
- Delaying admission until every lab and diagnostic study is back is an unrealistic expectation on the part of the admitting team.
- In some hospitals, a culture change will be necessary to facilitate early admissions.
- Early consultation for admission is often resisted, despite the obvious improvement in patient flow
  - There are legitimate concerns about right patient, right bed, right service, right time...
  - It can be disruptive to the work flow of the admitting teams
  - Saying no (or not yet...) can smooth the workflow of the in-patient team at the expense of the ED team

## Early Notification of the Admitting Team

- Getting the admitting physician or team involved early is often helpful.
- The ED physician and the in-patient physician (hospitalist) should be able to work together in this situation for the benefit of patients and their families.
- A defined working relationship should be in place
  - Regular meetings, conversations, and/or case reviews can be used to refine, optimize and reinforce this strategy
- As a general guideline, the ED physician should be able to confidently answer the following questions:
  - *Does the patient need admission?*
  - *Why does the patient need admission?*
  - *What service should the patient need to be admitted to?*
  - *Does the patient need the ICU?*
  - *Does the patient require emergent care, interventions or procedures?*

# Teams and Teamwork: It's About Your People...

## The A-Team:

- Put your "A" Team on the floor at all times!
- Hire right or repent at leisure –it's your call...



# Teams and Teamwork: It's About Your Processes...and Your Handoffs...





# PARTNERING WITH YOUR HOSPITALIST SERVICE

EmCare® Door-to-Discharge™

# Your Current State: The Classic Admission Process

- ER Physician makes Disposition
- Page Hospitalist = 30 to 60 minutes to respond
- Hospitalist asks for additional tests = 30 to 60 minutes
- Time for Hospitalist to arrive in ER = 30 to 60 minutes
- Hospitalist evaluates patient = 30 to 60 minutes
- Orders placed into system = 30 to 60 minutes
- Patients can “**board**” in the ER for up to 3 to 5 hours after work-up is complete

# It is a Classic Fragmented Model

**Two Separate Groups Managing Two Crucial Departments  
With Two Different Approaches...**

## Emergency Medicine Group



- Goals Not Aligned with Hospitalist Group
- Compensation Based on Volume and Productivity
- ED Physicians want to Increase Visits, Fast Track Admissions
  - Believe Hospitalists Refuse Patients

## Hospital Medicine Group



- Goals Not Aligned with ED Goals
  - Compensation is Fixed
- Providers have Average Daily Census Limits
- Believe ED Physicians are Dumping Patients on Them
  - Hospitalist Centered Admission Process

# ED Physicians and Hospital Medicine Physicians:

*It's Like Mixing Oil and Water...and there isn't a right or wrong here...*

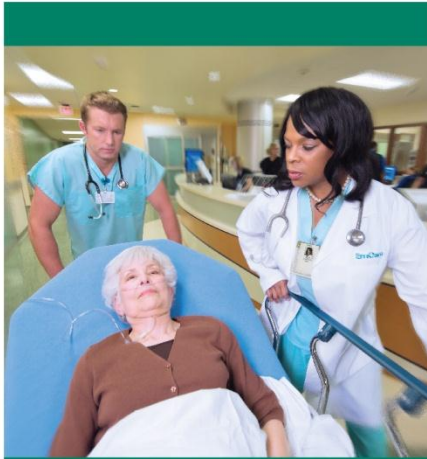
## ▪ Typical ED Physician

- Built for speed
- They thrive on intensity
- Stabilize and transport
- Diagnose, treat and discharge
- Move fast and make critical decisions quickly
- Focus on the big details
- LOS measured in **Minutes**

## ▪ Typical HM Physician

- Ponder
- Research
- Discuss more and more then come to a mutual decision and then discuss some more
- No speed, methodical decision making
- The opposite of an ED physician
- LOS measured in **Days**

# The Solution: EmCare® Door-to-Discharge™



## DOOR

*Patient seen in ED by a physician*



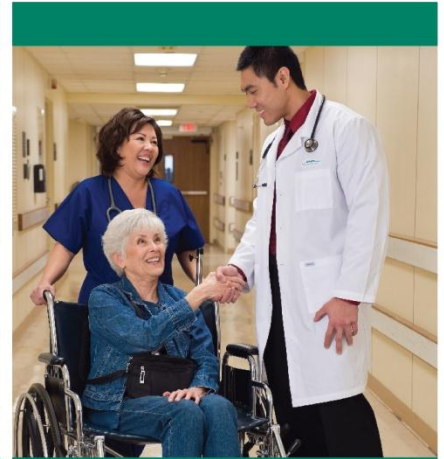
## COLLABORATE

*ED and Hospitalist physicians collaborate during the admission process*



## HOSPITALIST CARE

*Hospitalist physician oversees patient's care during inpatient stay.*



## DISCHARGE

*Patient discharged by Hospitalist*

# The Solution: EmCare® Door-to-Discharge™ Model

- Seamless patient care from the Emergency Department (Door) to Inpatient treatment and discharge (Discharge)
- Two groups working together as **ONE**
  - A coordinated admission process
  - Open communication
  - Less patient boarding
  - Shared goals
  - Better relationships



HOW IT WORKS

# Rapid Admission Process

- “RAP&GO” (Rapid Admission Protocols and Gap Orders) software, an internet-based set of orders with predefined protocols helps expedite patient admits from the emergency department.
- “RAP&GO” is a solution created by doctors to help hospitals achieve outstanding CMS time measures for patient admission from the ED.





My Home Log Out

### Pneumonia (CAP) Criteria

#### General

- 33 Age
- Female?
- Nursing home resident?

#### Comorbid illnesses

- Neoplastic disease history?
- Liver disease?
- CHF?
- Cerebrovascular disease?
- Chronic renal disease?

#### Physical examination findings

- Altered mental status?
- Respiratory rate > 29?
- Systolic blood pressure < 90?
- Temperature < 35C (95F) or > 39.9C (103.8F)?
- Pulse > 124?

#### Laboratory findings

- pH < 7.35?
- BUN > 29?
- Sodium < 130?
- Glucose > 249 (US) or > 13.8 (SI) ?
- Hematocrit < 30%?
- Partial pressure of Oxygen < 60?
- Pleural effusion on x-ray?

#### Additional Factors

#### Results:

High Risk. >>>2.8% mortality.

#### Disposition:

Hospitalization recommended.  
**STRONGLY** consider acute MI workup.  
Consider ICU Hospitalization.

Generate Gap Orders

PORT Score:138

#### Other Rapid Admission Protocol (RAP):

- [Chest Pain](#)
- [Congestive Heart Failure](#)
- [COPD](#)

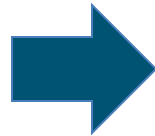
#### References:

- [Pneumonia: Prediction Model](#)

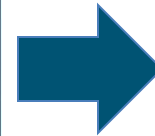
# Handing Over the Patient to Our Hospitalist Teammates



Gap Orders generated.

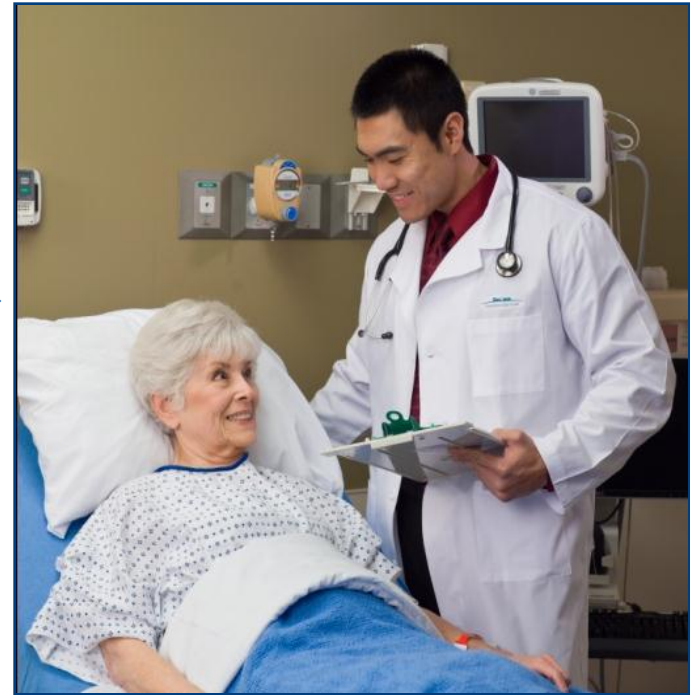
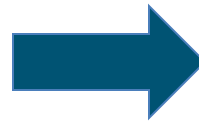
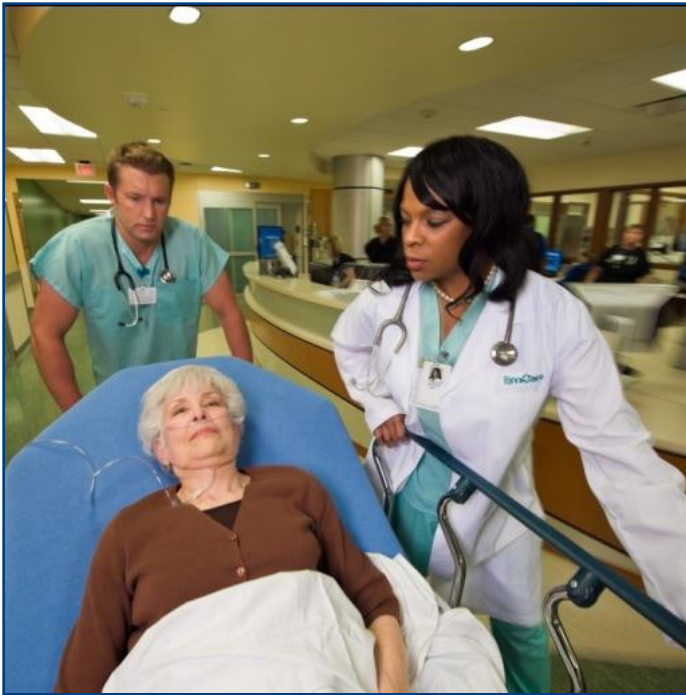


Print and sign Gap Orders.



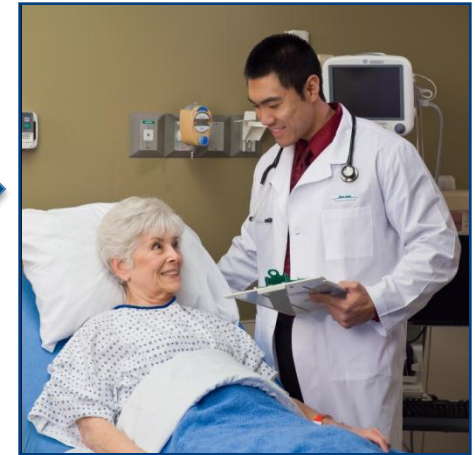
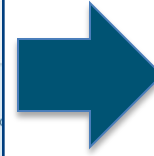
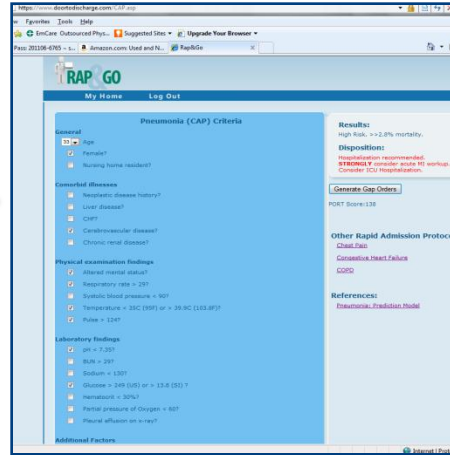
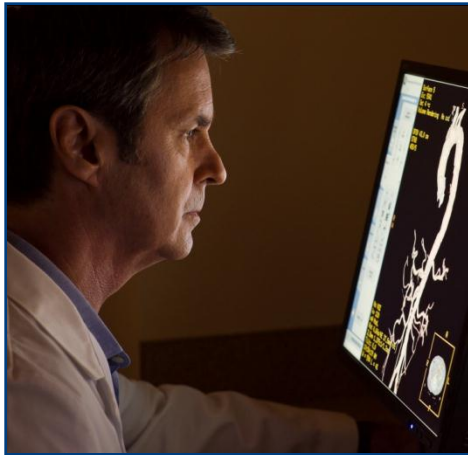
ED Physician handovers patient to Hospitalist Physician with defined orders and protocols.

# Patient Immediately Moved to Floor



# Direct Admit Patient From PCP to Hospitalist

- Increasing the PCP's use of Hospital by utilizing the RAP website in their office





# THE RESULTS

# Before and After with RAP & GO

**Decreased** “ER boarding time” by over **2 hours**

## Before Rapid Admission Process

ED  Floor  
>3.0 Hours (180 minutes)

## After Rapid Admission Process

ED  Floor  
<25 Minutes



# Regional Medical Center Success Story

## ED Improvements

- ED Admissions increased by 32%
  - *Response time from hospitalist group improved*
  - *The return visits to the ED are 50% below national benchmarks*
- Patients leaving without being treated dropped from 10% to less than 2%
- Total ED volume increased by 10%

## Hospital Medicine Improvements

- Adult inpatient LOS decreased from 6.5 days to just under 3.0 days while decreasing readmit rates
  - *Increased beds per year by over 100%*
- Daily patient encounters increased from 12 to an average of nearly 40 every day
- CMS Core Measure compliance approached 100%



# THE BENEFITS

# The Benefits of the Rapid Admission Process

- The patient can be moved to the floor in <25 minutes once disposition is made
- It can shave up to 2 to 3 hours off patient “boarding time” in the ER
- It frees up ER beds and increase ER bed capacity
- RAP & GO increases ER volume by freeing up beds
- RAP & GO decreases ER LPMSE/LWBS rates
- It improves the ER throughput metrics

# Your Pillars of Value

## ER / HM DOOR TO DISCHARGE MODEL



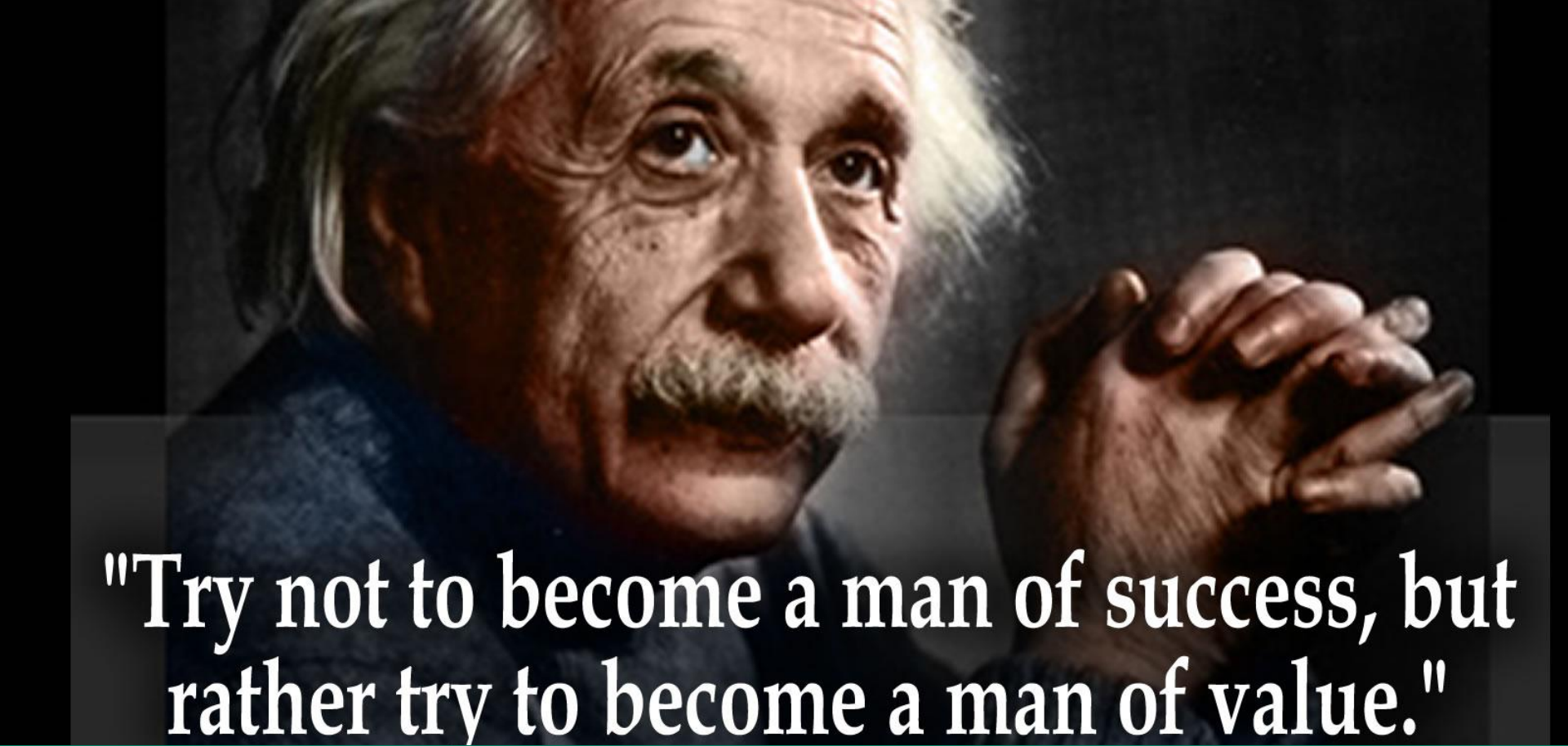
**Hospital Subsidy  
Reduction**



**ER Metrics  
Improved**



**Hospital  
ROI**



**"Try not to become a man of success, but rather try to become a man of value."**

**IN CONCLUSION**



# REFERENCES & RESOURCES

## EMERGENCY DEPARTMENT AND HOSPITAL MEDICINE OUTSOURCING

Partnerships address challenges head-on with a combination of proven strategies and creative tactics

**HealthLeaders Media**  
A Division of HCPro

SPONSORED SUPPLEMENT TO HEALTHLEADERS MAGAZINE

## EmCare's Door-to-Discharge™ Service Provides Seamless Coordination of Care

Healthcare providers today face a variety of challenges in their quest to improve quality, rein in costs, and provide exemplary customer service. Many are experiencing an increased number of visits—both inpatient and emergency department (ED)—yet they lack the infrastructure, financial resources, qualified staff, or leadership culture to manage the influx efficiently and at a high level.

These challenges often result in longer ED wait times, leading to more instances in which patients leave prior to treatment or a medical screening examination (LPT/LMSE). Not only does this negatively impact patient satisfaction scores, it also has the potential to greatly affect revenue.

One hospital in New Mexico was facing just those types of challenges. Its LPT/LMSE percentages were increasing and its ED volume was not increasing because of throughput issues. On the inpatient side, length of stay (LOS) and readmission rates were rising and the facility was experiencing a low case-mix index and lackluster core measure performance.

Looking for innovative, cost-effective solutions, the hospital turned to EmCare, its long-time physician services partner. EmCare, a leader in providing ED, hospital medicine, anesthesiology, and radiology/tele-radiology services, quickly went to work implementing its proprietary Door-to-Discharge™ integrated hospitalist/ED service.

Door-to-Discharge, which is proving successful in facilities throughout the country, aligns the goals of the hospitalists and the emergency physicians with those of the hospital. It is designed to expedite and improve patient care by moving patients more efficiently from the ED—often the hospital's "front door"—to successful treatment and a quicker discharge.

Without the tight integration provided by Door-to-Discharge, emergency physicians and hospitalists often operate under different compensation structures and value different benchmarks. For instance, while increasing throughput might be a high priority for an emergency physician, a hospitalist may be more inclined to find solutions that decrease LOS.

Door-to-Discharge assumes that, with the right incentives, the two specialties can align their goals and increase efficiencies, improve communication, and strengthen relationships in the name of higher patient volume with no compromise in the quality of care. An added benefit of the seamless handoff from the ED to the hospital is the positive effect on core measures, many of which begin with the emergency physician and continue with the hospitalist.

To increase efficiencies, Door-to-Discharge utilizes a rapid admission process. Developed with input from both emergency and hospital medicine physicians, the process is designed to increase capacity by quickly moving patients from entry to treatment. When a patient arrives in the ED with certain common medical conditions such as chest pain or pneumonia, and is subsequently admitted to the hospital, this rapid admission process eliminates the uncertainties that have led to delays or negotiations between ED staff and hospitalists in the past. The Door-to-Discharge model is based on trust and teamwork between emergency physicians and hospital medicine staff and has measurable benefits, including:

- Increased ED volume
- Reduced LOS
- Improved patient outcomes
- Greater ED throughput
- Improved bed utilization
- Decreased cost per case
- Reduced readmission rates

Even in its early stages, Door-to-Discharge has already paid benefits for the hospital, its physicians, and its patients.

### Results

**March 2010 to Date**

- ED volume: Increased 10%
- LPT/LMSE: Decreased from 10% to less than 2%
- Adult inpatient LOS: Decreased from 6.5 days to under 3 days
- Daily inpatient encounters: Increased from 12 to 40

The hospital has also experienced a decrease in readmission rates and improved efficiencies.

- Reduced LOS
- Increased hospital capacity
- Decreased cost per case
- Improved case-mix index: patients that were previously transferred can now be treated

With Door-to-Discharge, hospitalists and emergency physicians work together to improve quality and control costs, providing a win-win for hospitals and their patients.

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May 2011 ■ ED 11

# Hardwiring Flow

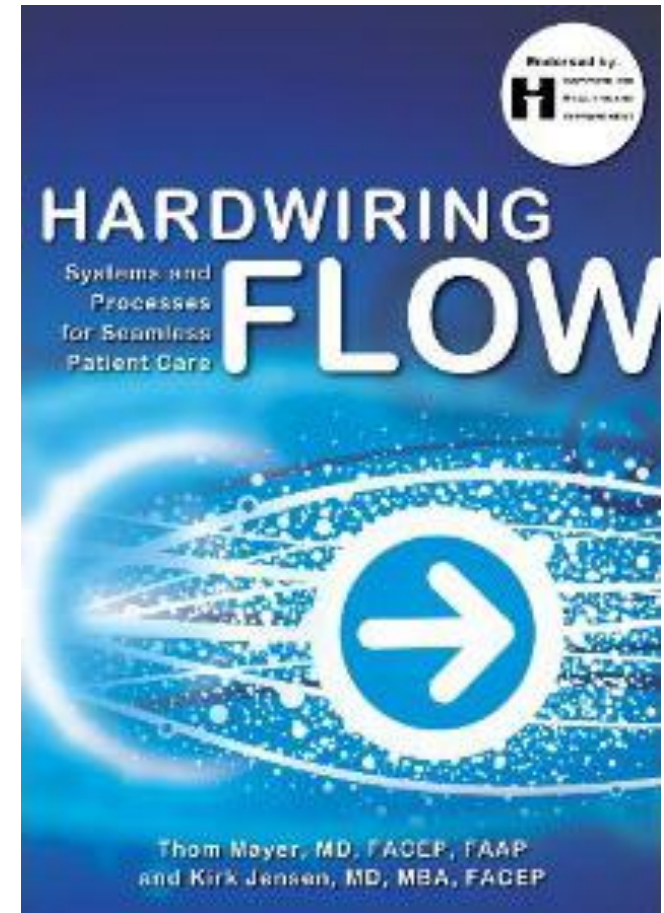
## *Systems and Processes for Seamless Patient Care*

Thom Mayer, MD, FACEP, FAAP

Kirk Jensen, MD, MBA, FACEP

- ▶ Why patient flow helps organizations maximize the “Three Es”: Efficiency, Effectiveness, and Execution
- ▶ How to implement a proven methodology for improving patient flow
- ▶ 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

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# Leadership for Smooth Patient Flow:

## *Improved Outcomes, Improved Service, Improved Bottom Line*

Kirk B. Jensen, MD, FACEP  
Thom A. Mayer, MD, FACEP, FAAP  
Shari J. Welch, MD, FACEP  
Carol Haraden, PhD, FACEP

The heart of the book focuses on the practical information and leadership techniques you can use to foster change and remove the barriers to smooth patient flow.

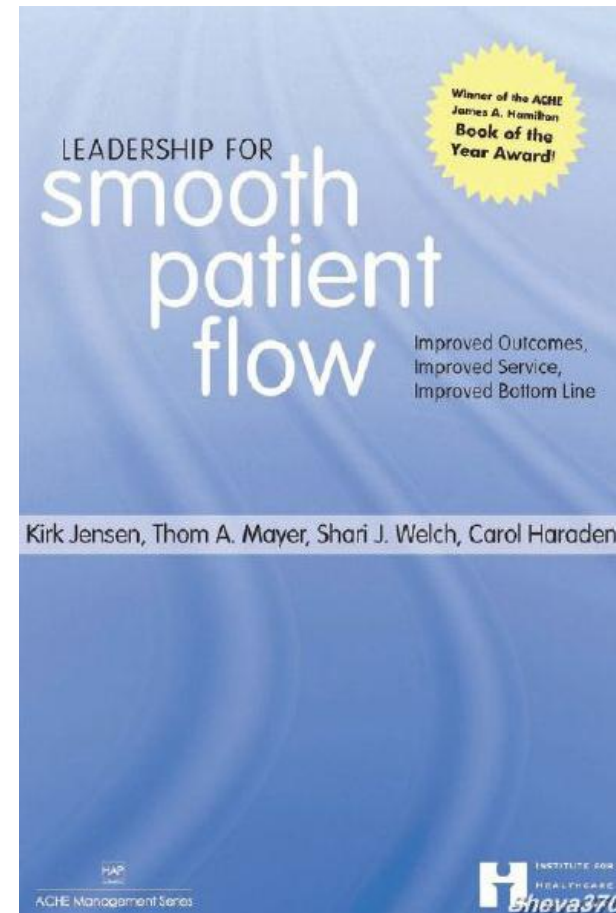
**You will learn how to:** Break down departmental silos and build a multidisciplinary patient flow team Use metrics and benchmarking data to evaluate your organization and set goals Create and implement a reward system to initiate and sustain good patient flow behaviors Improve patient flow through the emergency department—the main point of entry into your organization The book also explores what healthcare institutions can learn from other service organizations including Disney, Ritz-Carlton, and Starbucks. It discusses how to adapt their successful demand management and customer service techniques to the healthcare environment.

“This book marks a milestone in the ability to explain and explore flow as a central, improvable property of healthcare systems. The authors are masters of both theory and application, and they speak from real experiences bravely met.”

Donald M. Berwick, MD  
President and CEO

Institute for Healthcare Improvement (from the foreword)

ACHE + Institute for Healthcare Improvement



# The Hospital Executive's Guide to Emergency Department Management

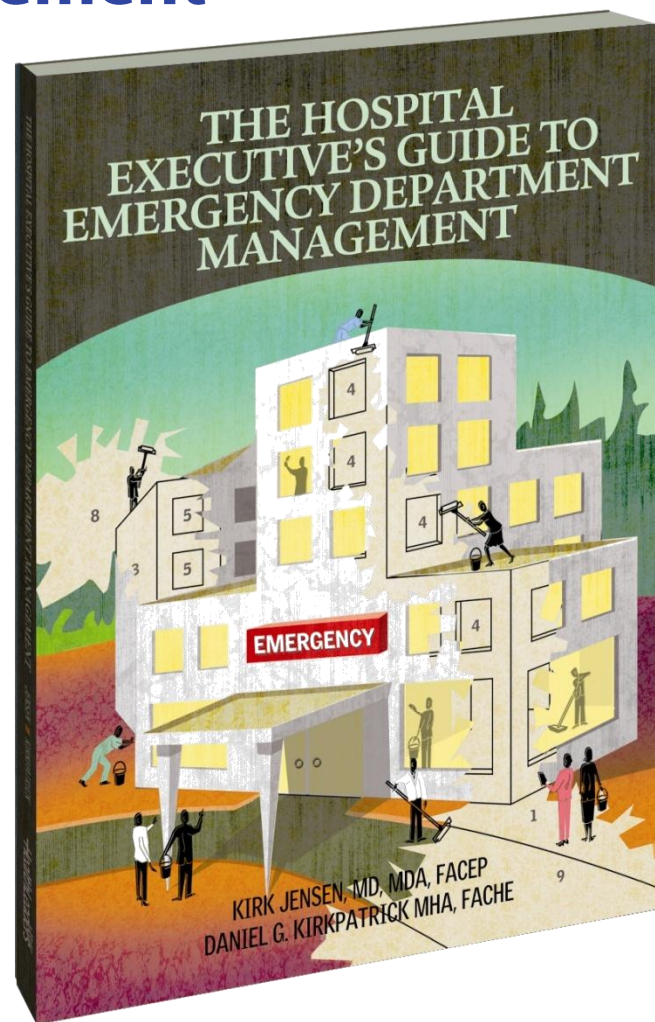
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Daniel G. Kirkpatrick, MHA, FACHE

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1. A Design for Operational Excellence
2. Leadership
3. Fielding Your Best Team
4. Improving Patient Flow in the Emergency Department
5. Customer Service: Ensuring Patient Satisfaction
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HcPro ISBN: 978-1-60146-742-3



# Improving Patient Flow In the Emergency Department



# Managing Patient Flow in Hospitals:

## Strategies and Solutions, Second Edition

# Managing Patient Flow in Hospitals

## Strategies and Solutions

Second Edition



Edited by Eugene Litvak, Ph.D.

Foreword by Susan Dentzer

Joint Commission  
Resources

Joint Commission  
International

## Chapter 8

### Improving Hospitalwide Patient Flow at Northwest Community Hospital

Barbara Weintraub, R.N., M.S.N., M.P.H., A.P.N., C.E.N., F.A.E.N.; Kirk Jensen, M.D., M.B.A., F.A.C.E.P.; Karen Colby, M.S., R.N.; C.N.A.A.-B.C.

From a systems standpoint, hospitals have inputs (patients coming to the hospital), throughputs (patients being treated or admitted), and outputs (patients being released). Flow is defined as the movement of these patients into, through, and out of the hospital. How efficiently this movement is accomplished determines the rate of flow through the hospital, if not throughout the entire health care system.

Many factors control the flow within the hospital. First, barriers to entry may slow or stop the flow. In the emergency department (ED), for example, the inability to get patients admitted contributes to a patient flow backlog that strains staff and creates long waits, sometimes compromising quality of care or necessitating diversions. In the ICU, transfers of patients to the floors can be delayed by the unavailability of beds, keeping patients waiting for needed ICU spaces. Patients often must be moved to less than ideal places because the system is not flowing smoothly, compromising the quality of patient care. Second, barriers to exit can slow or stop the flow, as well. If a patient is not discharged in an efficient and timely way, a needed and valuable space is rendered unavailable for longer than is necessary, creating backups throughout the system. Paradoxically, barriers to exit help create the barriers to entry. If inpatients cannot get out, new patients cannot get in.

As the venerable and ever-interesting Yogi Berra once said, "People don't go there anymore. It's too crowded." Although this oxymoron probably only made sense to Yogi, it is, in fact, the incentive for hospitals to work on improving patient flow and throughput. In the health care industry, patient service and patient safety are paramount. In the current economic and reimbursement climate, collecting every hard-earned dime can be tantamount to survival. The service and safety compromises, as well as the loss of income derived from hospitals going on bypass or diversion, or from patients leaving before being seen, or from prolonged inpatient stays, simply cannot be tolerated. Furthermore, although it may not be rocket science, optimizing patient flow is surprisingly analogous—to get from launch to landing quickly and safely. Throughput as a science has been around since queues, or waiting lines, were first analyzed by A.K. Erlang in 1913, in the context of telephone facilities.<sup>1</sup>

Industries as diverse as airlines, trucking, and fast-food drive-throughs have since made use of queuing theory, computer simulation, and smoothing demand to maximize throughput and optimize resource allocation. Despite its proven ability to better serve customers, reduce costs, and improve safety, health care has been late to jump into the science of operations management (OM)

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# Real Time Demand Capacity Management and Hospital-Wide Patient Flow

*The Joint Commission Journal on Quality and Patient Safety*

## Timeliness and Efficiency

### Using Real-Time Demand Capacity Management to Improve Hospitalwide Patient Flow

*Roger Resar, M.D.; Kevin Nolan, M.A.; Deborah Kaczynski, M.S.; Kirk Jensen, M.D., M.B.A., F.A.C.C.P.*

In 2004, The Joint Commission issued its first accreditation standards—effective January 1, 2005—for managing patient flow.<sup>71</sup>

The current Leadership Standard, LD.04.03.11, states, “The hospital manages the flow of patients throughout the hospital.”<sup>72</sup>

When first issued, the standard served as a call to action for hospitals to focus more formally on patient flow issues. Yet, many hospitals still lack the processes and structures to admit or transfer patients to an inpatient bed on a timely basis. This often results in emergency department (ED) overcrowding,<sup>3-5</sup> because the beds are being used by patients waiting to be admitted. Such overcrowding has been shown to have an adverse effect on patient outcomes and the well-being of health care workers.<sup>6-8</sup>

To address the Joint Commission standard, many hospitals established flow committees to identify the major barriers to patient flow and then embarked on improvement projects focused on these barriers. In our observations, three issues affecting the results from this approach have surfaced, as follows:

1. The improvement projects selected are often not connected to the true bottlenecks identified at the time that problems with patient flow occur.<sup>9</sup>
2. The changes that result from the projects may optimize only part of the system but may not optimize flow throughout the hospital.<sup>10</sup>
3. Few hospitals have the resources or the capability to work on the numerous proposed projects.<sup>11</sup>

Given those issues, in 2006 the Institute for Healthcare Improvement (IHI), in the context of its Improving Hospitalwide Patient Flow Community began developing a method to improve hospitalwide patient flow on the basis of a more

\* Standard LD.3.10.10, as it was then known, stated, “The leaders develop and implement plans to identify and mitigate impediments to efficient patient flow throughout the hospital.”<sup>73</sup>

## Article-at-a-Glance

**Background:** The Joint Commission’s accreditation standard on managing patient flow, effective January 2005, served as a call to action for hospitals, yet many hospitals still lack the processes and structures to admit or transfer patients to an inpatient bed on a timely basis. In 2007 the University of Pittsburgh Medical Center (UPMC) at Shadyside, a 526-bed tertiary care hospital, began testing and implementing real-time demand capacity management (RTDC) at an initial pilot site. The hospital had identified improved patient flow as a strategic goal in 2002, but a series of patient flow projects failed to result in improvement.

**Implementing RTDC:** Standard processes for the four RTDC steps—Predicting Capacity, Predicting Demand, Developing a Plan, and Evaluating a Plan—and standard structures for unit bed huddles and the hospital bed meetings were developed. The neurosurgery (NS) service line’s ICU and stepdown unit were designated as the first pilot sites, but work was quickly spread to other units.

**Results:** Improvements were achieved and have been sustained through early 2011 for all measures, including (1) the unit-based reliability of discharge predictions; (2) overnight holds in the postanesthesia care unit, a problem eliminated two months after RTDC work began; (3) the percentage of patients who left without being seen (LWBS), routinely < 0.5% by May 2008; (5) the emergency department median length of stay for admitted patients, routinely < 4 hours after March 2008; and (6) aggregate length of stay (ALOS), generally maintained at < 5.75 days.

**Conclusions:** RTDC represents a promising approach to improving hospitalwide patient flow. Its four steps, integrated into current bed management processes, are not an add-on to the work needing to be accomplished everyday.

# Benchmarking Resources

- Where to find data?
- Your neighbors
  - ACEP: [www.acep.org](http://www.acep.org)
  - Premier: [www.premier.com](http://www.premier.com)
  - VHA: [www.vha.com](http://www.vha.com)
  - ED Benchmarking Alliance: [www.edbenchmarking.org](http://www.edbenchmarking.org)
  - UHC: [www.uhc.org](http://www.uhc.org)