Web&ACTI ON Program: Improving Patient Flow - Getting Started

Session 3: Overview of the Key Components of an Administrative System
Concept Design: A System for Hospital Flow

(Current hypothesis 9/05)

Administrative System

* Bed management (Bed coordinator, Bed huddles, Real time electronic bed status/bed board, etc)
* Demand/capacity measurement and planning
* Early warning and response (contingency plans) system for large fluctuations in demand or capacity

Care System

Direct Admits

ED

OR

ICU 1

ICU 2

Telemetry

Unit 1

Unit 2

Unit 3

Unit 4

Unit 10

Home

SNF

Nursing Home

Rehab

* Preempt ED visits
* Smooth surgical flow
* Admission/discharge criteria
* Multidisciplinary rounds
* Synchronization of admissions/transfers/discharges
* Discharge appointments

Support System

* Discharge Planning
* Transport in and out hospital
* Case Management
* Housekeeping

*Planning w/extended care facilities
Objectives

1. Discuss some key components of an Administrative System for patient flow
2. Share some ideas on getting started to improve the Administrative System for patient flow in your hospital
1. Bed Management Process

2. Demand/Capacity Measures & Planning

3. Early Warning and Response System
1. Bed Management Process

Steps that repeatedly come together to transition patients through the hospital
# Bed Management Process - East Alabama MC

## Flowchart Description

**Begins:** Patient presents at point of entry  
**Ends:** Patient assigned to an Inpatient bed or leaves facility  

**Data Sources:** Transport tracking, Pre-Admit tracking, Bed tracking, Bed List, Orders

---

### Key Points

- **Surgery patient - PACU to Inpatient**
- **Cardiac Cath Lab (move to ACU)**
- **OP Surgery - Endoscopy (move to ADJ)**

---

**Orders**

- RN/Staff moves patient up in Bed Board system (Bed Board)

**Admit patient**

- **Y:** Orders
  - Patient arrives
  - Unit Clerk moves patient up in Bed Board system (based on test)

**Bed Available?**

- **Y:** Assign bed
  - Admit Unit (ADJ), criteria met?
  - Bed Available in ADJ?

**Patient leaves ED**

---

**Patient present at point of entry**

**Ends:** Patient assigned to an Inpatient bed or leaves facility

---

**Additional Points**

- **Direct Admit - Known from physician office**
- **Direct Admit - Suspect - Orders in ER**

---

**Orders**

- Patient wait in lobby
  - Y: Patient wait in lobby
  - N: Patient wait in ED

---

**Orders**

- Can patient wait in lobby for bed?

---

**Orders**

- Patient wait in lobby
  - Y: Patient wait in ED
  - N: Back to Test

---

**Orders**

- Back to Test

---

**Orders**

- Transfer patient to ED, bed not available and added to test

---

**Orders**

- Bed Available at unit?
Potential Components of a Bed Management Process

• Bed Coordinator
• Visual displays of bed status (bed boards or electronic)
• Bed Huddles
• Mobile patient placement nurse
• Text messaging to cell phones
Visual Patient, Bed & Equipment Tracking
awarix
Building the Case

Admissions
• Average LOS Reduction
• Hidden Bed Visibility

Observation Patient Management
• Written Discharge Management
• Scheduled Discharge Management
• AM Discharge Management
• Critical Care Transfer Management

Patient Safety

Patient Process Visibility
• EVS Workflow Management
• Bed Control Staffing
• Savings Nurse Recruitment
• Patient Hand-off Management

Clinical Pathways
Supporting Graphs

ED Volume vs ED Diversion

- **Visits**
  - Dec: 2500
  - Jan: 3000
  - Feb: 3500
  - Mar: 4000
  - Apr: 4500
  - May: 5000

- **Hours**
  - Dec: 0
  - Jan: 20
  - Feb: 40
  - Mar: 60
  - Apr: 80
  - May: 100

**Legend**
- **Volume**
- **ED Diversion**
Supporting Graphs

Diversion Hours

- Critical Care
- Med/Surg
- ED

Dec | Jan | Feb | Mar | Apr | May
--- | --- | --- | --- | --- | ---
0   | 0   | 0   | 0   | 0   | 0   
100  | 100  | 100  | 100  | 100  | 100  
200  | 200  | 200  | 200  | 200  | 200  
300  | 300  | 300  | 300  | 300  | 300  
400  | 400  | 400  | 400  | 400  | 400  
500  | 500  | 500  | 500  | 500  | 500  

Copyright © 2005 Institute for Healthcare Improvement
Supporting Graphs

Average OBS LOS

OBS ALOS (h)

Average OBS LOS
Bed Management Process - Getting Started

- Start where you are. Document (flowchart) and improve your current process
- Consider:
  - Central area
  - Bed board
  - Coordinator
  - Bed huddle
- Work with IT (Use existing computer architecture)
- An RFP for an automated system
2. Demand Capacity Measures and Planning
3. Early Warning Systems
• Planning ahead to match better capacity and demand
• Planning based on understanding variation due to:
  - Seasonality
  - Month
  - Day of the week
  - Time of the day
Wellspan-York Hospital Admissions by Month

- March
- June

Admissions

- March: Data points indicating lower admissions.
- June: Data points indicating higher admissions.

Copyright © 2005 Institute for Healthcare Improvement
Wellspan-York Hospital Admissions by Day of Week

Admissions

Sunday to Saturday

40 50 60 70 80 90 100 110 120
Wellspan-York Hospital Total Admissions from the ED by Shift
• Talk with IT about what data is available that might help in planning
• Gather the data and review it. Determine how accurate it is in predicting future demand
• Discuss with the bed coordinator what actions could be taken if occupancy could be predicted from historical data
• Test some of the suggestions over a short period of time
3. Early Warning and Response System
Hyper-Active Bob

- Roof-top cameras that monitor traffic
- Volume forecasting
- Waste has been cut in half
- Reduced waiting time
- Recognition software
Aim: Manage large fluctuations in demand or capacity

Components:
- Signals
- Actions (Contingency plans) based on Signals

Consider an Early Warning and Response System for predicted demand:
- a week ahead
- a day ahead
- the day of
Affinity Health System – Menasha, Wisconsin

Predicting Demand  
- Week ahead  
- Day ahead
Patient Flow Issues

Poor Predicting of Patient Flow

- Fluctuating census
- Cath Lab patients potential bed needs were not predicted
- Surgery schedule not reviewed to see stress points
- Predictability of ED/Direct admissions not considered
- ED frequently backed up and holding patients overnight
Staffing Issues:

- Holding surgeries due to lack of staff
- Paying premium dollars to fill open shifts
- Mandatory overtime
- Staff burnout
- Managers spending all their time looking for staff
Self Analysis

- We were reactive
- Intermittently called bed huddles only during crises
- Bed huddle meeting focused more on staffing than patient flow
Extended Friday Bed Huddle
Review scheduled activity for the next week:
- Planned surgeries
- Cath Lab schedule
- Staffing variances
- Predicated Emergency Room admissions
### Weekly Planned Admissions

**WEEK OF APRIL 3 – 9**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PCU 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Surgeries</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>- ED admissions</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>- Discharges</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>Ok</td>
<td>Even RN-1</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>- Cath Lab</td>
<td>1</td>
<td>Ok</td>
<td>RN +1 days</td>
<td>Ok</td>
<td></td>
<td>OK</td>
<td>Ok</td>
<td></td>
</tr>
<tr>
<td>- Staff Variance</td>
<td>RN -1 eve</td>
<td>Ok</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ICU</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Surgeries</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Cath Lab</td>
<td>1</td>
<td>1</td>
<td>RN eve/night 2</td>
<td>Ok</td>
<td>Ok</td>
<td>RN-1</td>
<td>Ok</td>
<td></td>
</tr>
<tr>
<td>- Discharge/Trans</td>
<td>Ok</td>
<td>Ok</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Staff Variance</td>
<td>Ok</td>
<td>Ok</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PCU 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Surgeries</td>
<td>9</td>
<td>3</td>
<td>10</td>
<td>4</td>
<td>8</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>- ED admissions</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>- Discharges</td>
<td>10</td>
<td>10</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>- Staff Variance</td>
<td>Ok</td>
<td>Ok</td>
<td>Eve-1 RN</td>
<td></td>
<td></td>
<td>Eve-1 Helper</td>
<td>Ok</td>
<td>Days-1 RN</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Every Weekday conduct 12:30 bed meeting and look at the next 24 hours

- Review surgeries and add-ons
- Current census
- Update staff variances
- Review accuracy of the planned discharges
- Ensure there are rooms and staff for the predicted ED admissions
- Develop plans as needed to keep flow going for next 24 hours
<table>
<thead>
<tr>
<th>Unit/ Phone</th>
<th>7 am</th>
<th>3 PM</th>
<th>Surgicals</th>
<th>Caths</th>
<th>Discharge/ Transfer</th>
<th>Staff Variances</th>
<th>Other Activity</th>
<th>Other Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICU (12) 31000</td>
<td>9</td>
<td></td>
<td>2</td>
<td></td>
<td>D PNOC</td>
<td>RN - 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCU 1 (26) 31543</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td>D PM NOC</td>
<td>OK</td>
<td>OK</td>
<td>Helper - 1</td>
</tr>
<tr>
<td>PCU 2 (39) 32188 Peds-32182</td>
<td>30</td>
<td></td>
<td>10</td>
<td>14</td>
<td>D PM NOC</td>
<td>RN + 1</td>
<td>OK</td>
<td>Helper - 1</td>
</tr>
<tr>
<td>OB/ NSY (14) 31280</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td>D PNOC</td>
<td>Ok</td>
<td>Ok</td>
<td>Ok</td>
</tr>
<tr>
<td>Rehab (10) 30400</td>
<td>8</td>
<td></td>
<td>1</td>
<td>1</td>
<td>D PM NOC</td>
<td>Ok</td>
<td>Ok</td>
<td>Ok</td>
</tr>
</tbody>
</table>
Lessons from the Experience

- Planned Discharges
  - Daily utilization
  - Weekly predictability
- Unscheduled Admission Trends from the ED and Direct
- Case Management to Bed Huddles
<table>
<thead>
<tr>
<th>Date</th>
<th>Total PT’s DC</th>
<th>Total Scheduled PT’s DC</th>
<th>On-Time Discharges</th>
<th>% Timely Discharges</th>
<th>% known DC’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week of 1/17/05</td>
<td>?</td>
<td>18</td>
<td>7</td>
<td>38%</td>
<td>?</td>
</tr>
<tr>
<td>May 2005</td>
<td>491</td>
<td>316</td>
<td>308</td>
<td>97%</td>
<td>64%</td>
</tr>
</tbody>
</table>
## Affinity Health System Improvements Since Last Fiscal Year

<table>
<thead>
<tr>
<th></th>
<th>FY04 Hrs Wk/Stat</th>
<th>FY05 YTD Hrs Wk/Stat</th>
<th>Approx FTE Savings</th>
<th>Approx Dollar Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCU1</td>
<td>12.45</td>
<td>10.05</td>
<td>10.59</td>
<td>522,222</td>
</tr>
<tr>
<td>ICU</td>
<td>21.28</td>
<td>16.57</td>
<td>7.23</td>
<td>474,081</td>
</tr>
<tr>
<td>NICU</td>
<td>15.04</td>
<td>14.24</td>
<td>1.70</td>
<td>105,077</td>
</tr>
<tr>
<td>Birthplace</td>
<td>13.93</td>
<td>12.85</td>
<td>2.18</td>
<td>126,088</td>
</tr>
<tr>
<td>PCU2</td>
<td>11.04</td>
<td>10.66</td>
<td>1.91</td>
<td>87,618</td>
</tr>
<tr>
<td>4 South</td>
<td>10.21</td>
<td>10.00</td>
<td>1.17</td>
<td>53,990</td>
</tr>
<tr>
<td>Respiratory Therapy</td>
<td>25.52</td>
<td>22.71</td>
<td>1.44</td>
<td>81,203</td>
</tr>
<tr>
<td>Cardiac Cath</td>
<td>488.61</td>
<td>425.79</td>
<td>1.13</td>
<td>78,868</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>27.35</td>
<td>$1,403,186</td>
</tr>
</tbody>
</table>
## Bed Turns

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td># of admissions</td>
<td>7161</td>
<td>5994</td>
</tr>
<tr>
<td># of Observations</td>
<td>2300</td>
<td>2265</td>
</tr>
<tr>
<td># of Functional Beds</td>
<td>140</td>
<td>100</td>
</tr>
<tr>
<td>Case Mix Index</td>
<td>1.2789</td>
<td>1.3042</td>
</tr>
<tr>
<td>Length of stay</td>
<td>4.56</td>
<td>3.79</td>
</tr>
<tr>
<td>Bed Turns</td>
<td>81.8</td>
<td>100.8</td>
</tr>
</tbody>
</table>
Some ED Statistics

2005 ED Volume

Median Time from ED Decision to Arrival on Floor

Some ED Statistics
Benefits

- Proactive staffing with decreased cost
- Able to plan opening of a closed medical unit as the need is predicted
- No ED diversions since this was developed and did not increase LOS
- Decreased ED bottlenecks
- Appropriately direct patient flow
Some Tips for Others

- Involve multiple disciplines in the process
  - Include case management early

- Gather Data
  - Discharges
  - Trend the emergency department and direct patient admissions and include them into staffing and planning

Make sure you don’t quit or go back to old habits.
### Green Zone

**Definition:**
Availability (Combination of the following):
- ICU, Telemetry: Med/Surg
- Patients in ED Waiting Room: <10
- Patients in ED Hallway: 0

**Notify:**
- Hall monitors reflect "green zone"

### Yellow Zone

**Definition:**
Availability (Combination of the following):
- ICU: 4 beds
- Telemetry: Patients waiting > 4 hours
- Med/Surg: Patients waiting > 4 hours
- Patients in ED Waiting Room: 10-15 or any patient with an ESI of 2
- Patients in ED Hallway: 1-5

**Notify:**
- Clinical director on call
- Administrator on Call
- OOP
- Department Chairmen/Service line Leader
- Directors of Imaging, Housekeeping, Lab and Transport
- YHLT via email
- Update hall monitors to reflect "yellow zone" status

### Red Zone

**Definition:**
Availability (Combination of the following):
- ICU: 0 beds with Gridlock
- Telemetry: EAU/ED patients on hold > 6 hours
- Med/Surg: EAU/ED patients on hold > 6 hours
- Patients in ED Waiting Room: >15 or more than 1 patient with an ESI of 2
- Patient in ED Hallway: >5
- Two or more patients who meet trauma team criteria in main ED or in shock

**Notify:**
- Clinical director on call
- President of the Medical Staff
- All staff - FYI screen
- Put notice of "Red Zone" status on power chart
- Update hall monitor to reflect "red zone" status
### Green Zone

**Actions:**
- Conduct Bed Huddle Meeting at least every morning
- Care Management to work with Nurse Managers and Physicians to expedite discharges
- Prioritize Imaging and Lab tests for patients being admitted and discharged
- Administrative Coordinator (AC) has ultimate authority related to bed placement including all transfers/Direct Admissions must be approved by the Administrative Coordinator
- "One hour rule" for physicians seeing patients in the ED is enforced
- Floor nurses must take call/fax report as soon as the bed is ready. Patient is sent immediately
- AC and Housekeeping Supervisor prioritize rooms to be cleaned

### Yellow Zone

**Actions:**
- Provide bed status update at least every two hours in the ED and huddle and needed
- Staffing expectations are increased to reflect 100% occupancy.
- Send additional RN/LPN staff to ED to care for admissions/holds
- Initiate Team Triage in ED
- Deploy additional transport staff to ED
- Deploy additional housekeeping to ED and/or inpatients units based on priority discharge beds
- Open overflow areas
- Relocate non-urgent ED patients back to the waiting room while awaiting results of diagnostic tests (to free up bed)
- Consider admit to LTAC
- Contact VNA to bring in additional resources to support early patient discharge/admission avoidance
- Care Managers initiate rapid discharge review process
- YH provide transportation for discharged patients who need it.

### Red Zone

**Actions:**
- Continue actions initiated during the Yellow Zone
- Consider the need to go on Divert
- Open additional overflow units/beds Urgent Care Center extends hours of operation.
- Set up and staff discharge holding area(s).
- Transfer ED patients who require admission to Gettysburg Hospital or Hanover Hospital if they are not on divert
- Physicians to conduct evening rounds as appropriate
- Notify NH/Rehab of need to discharge patients in the evening
- Evaluate the possibility of cancellation of scheduled elective procedures and transfers.
- Assess elective volume of cases for next three days.
Start with developing a “day of” early warning and response system and then include a “day ahead” and “week ahead”

For the day of, discuss with some units what signals them that problems with flow will occur that day
- Discuss the actions that could be taken on the same day that flow problems are signaled
- Develop preliminary “Signals and Actions Document” (See Wellspan example) and ask units to test them

For a week ahead and a day ahead predictions, see if the data on the Week Ahead and Day Ahead Templates are available
- Determine the accuracy of the predictions using the data
- Discuss with staff what actions could be taken if large fluctuations are predicted
1. **Bed Management Process**
Aim: Efficiently transition patients through the system
Some components of the process could be:
- Bed Coordinator
- Bed Huddles
- Bed status (electronic bed tracking systems, bed boards)

2. **Demand/Capacity Measures and Planning**
Aim: Planning ahead to better match capacity and demand
Use historical data to understand and plan for variation in demand
month to month, day to day, etc.

3. **Early Warning and Response System**
Aim: Respond to large fluctuations in demand or capacity
Consider predicting and acting on demand:
- a week ahead
- a day ahead
- the day of
Other Opportunities to Get Involved

**Web&ACTIONs**

- Preventing Adverse Drug Events through Medication Reconciliation (Begins November 8, 2005)
- Building a Safety Culture through Leadership WalkRounds (Begins March 23, 2006)
- Preventing Avoidable Deaths with Rapid Response Teams (Begins November 2005)
- Reducing Complications from Ventilators and Central Lines in the ICU (Begins October 26, 2005)
- Using the Global Trigger Tool for Improving Patient Safety (Begins February 14, 2006)

**17th National Forum on Quality Improvement in Healthcare**

December 11-13, 2005, Orlando, FL

For more information on the program listed above, keep an eye on the Programs page on [www.ihi.org](http://www.ihi.org).
Log in to IHI.org

The page you have requested is accessible to registered users only. Please take a moment to join the IHI.org community — it’s free and open to all — by following the Registration instructions below. If you are an existing user, please login with your email address and password.

Please login using the email address and password you provided when you registered for the site.

Email Address: 
Password: 

Remember my email and password on this computer

Login
Forgot Password
Login Help

Registration has many benefits:
- Use Improvement Tracker to document improvement projects, collect data on key measures, and keep track of changes over time.
- Download tools or use interactive tools.
- Participate in discussion groups with peers and expert hosts.
- Connect with peers and experts from around the world who are working on similar issues by using the Find a Colleague Directory.
- Receive newsletters and email updates about the launch of new Topics, features, and content posted to the site.
- Rate and comment on content.
- Share your improvement reports, tools, resources, and tips for improvement.
- Help IHI.org to better understand you and your interests so that we may tailor the site to better meet your needs.

Register with IHI.org
Enter “getstartflow” for the code.