Hospital Flow Case Study: Cincinnati Children’s Hospital

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Sr. Vice President – Medical Operations

Cincinnati Children’s Hospital
Cincinnati, Ohio

550 Bed Medical Center
Admissions/Year – 30,848  Opt Visits 1.02 M
Surgical Procedures – 32,000 cases
28 ORs, 2 IR suites, Hybrid Cath lab
8 OR Outpatient Surgery Center
1.4 M sq. ft. Research Space
15,000 Employees
What Do Patients “Hire” Us to Provide  
What do they call “Value”  

- Make the Right Diagnosis  
- Deliver the Correct Therapy / Treatment  

- Prevent Complications or Errors in Care  
- Deliver Safe Care regardless of the Inherent Risks  

- Get Me Home, Keep me at Home  
- Respect my needs  

- Give me my Money’s Worth  

Outcomes  
Safety  
Patient / Family Experience  
Value  

This is all FLOW management – it is essential for SAFETY, PATIENT / FAMILY EXPERIENCE and QUALITY DELIVERY.
"Flow" is a Safety Initiative

- Getting the “Rights” Right
  - Right Diagnosis and Treatment
  - Right Patient in Right Bed – Location
  - Right Nursing Staff and Staffing Expertise
  - Disease Specific Expertise
  - Equipment Expertise

- Prediction ➔ Framework for Safety
- Requires ability to “Predict” future needs, and manage present capacity ➔ control variability
- Operations Management techniques to understand and manage variability are the key to success

Value Equation for Healthcare

\[
\text{Value} = \frac{(\text{Outcomes } + \text{ Patient Experience}) \times \text{ Appropriateness}}{\text{Cost } + \text{ “Hassle Factor”}}
\]
For Critical Flow Failure Recognition

Weekly Critical Flow Failures
Over the last 52 weeks

# of New Failures

Type of Control Chart: P Chart

# of New Patient Failures

Type of Control Chart: P Chart

Total Failures (Bed Days)

Type of Control Chart: P Chart

Total # of Bed Days

Critical Flow Failure Recognition
Growth Requires Constant Efficiency Improvement

Critical Patient Flow Failures by Month

Key Drivers for Capacity Management

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<thead>
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### IHI Theory on Flow

**Outcomes**
- Decreaseunnecessary variability in care and managing LOS "failure".
- Reduce surgical schedules to improve through-put and to improve overall flow of patients to downstream ICU and inpatient units.
- Redesign surgical schedules to create a predictable flow of patients to downstream ICU and inpatient units.
- Redesign surgical schedules to expedite admissions from the ED and manage surgical schedules.

**Primary Drivers**
- Shape or Reduce Demand
- Match Capacity and Demand
- Redesign the System

**Secondary Drivers**
- Relocate care in ICUs in accordance with patient ICU setting.
- Decrease demand for hospital beds through delivering appropriate care.
- Decrease variation in surgical scheduling.
- Decrease demand for hospital beds by reducing hospital-acquired conditions.
- Decrease variation in surgical scheduling.
- Real time demand and capacity management processes.
- Early recognition for high census and surge management.
- Promote advanced illness planning.
- Increase efficiencies and throughput in the ER, ICU, eICU and Med/Surg units.
- Enhance care coordination (e.g. care, HH, residents, stroke, patients, etc.)

**Specific Change Ideas**
1. Proactive advanced illness planning.
3. Reduce readmissions for high risk populations.
5. Urgent Care and Retail Clinics.
6. Direct-patients in community-based mental health services.
7. Parameters & Demographics & treating patients at home.
8. Gender role of clinical pathways and evidence-based medicine.
9. Care management for vulnerable/high risk patient populations.
10. Decrease complications/compromise (e.g., ER, ICU, Unit, ED) with focus on.
11. Redesign surgical schedules to create a predictable flow of patients to downstream ICUs and inpatient units.
12. Decrease capacity/harm (e.g., HAPU, CAUTI, SSI, falls with harm).
13. Decrease complications/compromise (e.g., ER, ICU, Unit, ED) with focus on.
14. High-level protocols to expedite admissions from the ED and manage surgical schedules.
15. Redesign surgical schedules to expedite admissions from the ED and manage surgical schedules.
16. Redesign surgical schedules to expedite admissions from the ED and manage surgical schedules.

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Evidence Based Care

- Evidence Based Care Guidelines serve as an interface between rapidly evolving scientific information and busy clinical practices
- Developed by Inter-disciplinary teams – experts
- Implementation
  - Awareness of recommendation to facilitate change
  - Easy access to the Evidence
  - Feedback on Outcomes
  - Feedback on further improvements
- Culture of Improvement / Evidence Based Care

Integration – Priority – Practice - Plan

Prioritization – Goal = Exceptional, Safe, Affordable Care Every Child
  Owner – Executive Leadership

Practice – “What we Do” – Essential Steps, Decisions and Actions
  Owner – Clinical Leadership Teams – Departments / Divisions

Processes – “How we Do It” – Processes to execute to the goal
  Owner – Operational Leaders – Sites of Care

Plan – “Implement the Processes - plan through application of process steps
  Owner – Sites of Care leaders and clinical staff (MD / RN)

Front Line Implementation – “Just Do It” – Every day for every child
Cytomegalovirus Prophylaxis

- 75% Decrease in CMV infection – liver/intestine transplants
- Decreased IV-IGG expense

![Graph showing percentage of CMV Syndrome, CMV Infection, and No CMV pre-guideline and post-guideline.]

![Graph showing a decrease in expenditures and number of split organ transplants over time.]

Yearly SSI Patients - CCHMC

- Total SSI Patients: 1032
- 12 Years: 540 SSI’s Prevented
- 492 SSI’s

![Bar chart showing yearly SSI patients from 2005 to 2016.]

James M. Anderson Center for Health Systems Excellence
Yearly SSI Patients - CCHMC

- **Case Average**
  - 10 days LOS
  - $27,000.00
- **Business Case**
  - 5400 days LOS
  - $14.58 million

- **1032 SSI’s**
- **12 Years**
- **540 SSI’s Prevented**
- **492 SSI’s**

Standardization for Outcomes Merging Evidence Based Care and Practice
SSI Accomplishments

- Baseline rate: 4.4 SSIs/100 procedures, Current Rate: 1.7 SSIs/100 procedures – 60% reduction, 32% reduction in past 3 years - $17.4 Million from SSI alone
- Overall SPS - Estimated 6,686 fewer children harmed
- Since October 2009 - $121.4 Million saved in SPS Network

http://www.solutionsforpatientsafety.org/our-results/

Getting to “Better”

- “Clinical Practice Guidelines” – systematically developed statements that guide decision making…
  - Widely developed, limited effectiveness
  - There are times when it is advisable and appropriate to deviate from standard guidelines

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<th>Condition</th>
<th>Hospital Performance Rate, %</th>
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<td>Mean (1 SD)</td>
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<td>Asthma</td>
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<td>45.8 (13.7)</td>
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Recommended = 0

Parikh K, Agrawal S. JAMA Ped 2015;169;301-302
Getting to “Better”

- "Achievable Benchmarks of Care" (ABC’s)
- Actual performance at health care sites performing in the top 10%

### Table: Achievable Excellence Based on ABCs Compared With Median Performance for Pediatric Inpatient Care

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<th>Mean (1 SD)</th>
<th>Median (IQR)</th>
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<td>Antibiotic use</td>
<td>15.9 (6.8)</td>
<td>15.7 (11.6-19.1)</td>
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<tr>
<td>Bronchiolitis</td>
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<td>52.6 (15.5)</td>
<td>52.9 (39.6-64.1)</td>
<td>32.4</td>
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<tr>
<td>Steroid use</td>
<td>20.0 (9.4)</td>
<td>18.1 (13.9-24.1)</td>
<td>6.4</td>
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<tr>
<td>Antibiotic use</td>
<td>35.5 (8.3)</td>
<td>37.0 (32.1-40.5)</td>
<td>18.5</td>
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<td>Pneumonia</td>
<td></td>
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<tr>
<td>Initial narrow antibiotic use</td>
<td>27.9 (18.6)</td>
<td>27.3 (13.0-36.5)</td>
<td>60.7</td>
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Parikh K, Agrawal S. JAMAPed 2015;169;301-302

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### Getting to “Better” – ABC’s

- Hospital Site Performance
- Individual Performance

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### Pre-Smoothing ICU Elective Census

**ICU Daily Elective Census**

Prior to ICU Model for Smoothing

![Graph of Pre-Smoothing ICU Elective Census](image)
ICU Bed Availability – ICU Scheduling

Case Statistics by Category

<table>
<thead>
<tr>
<th>Category</th>
<th>Total PICU Days</th>
<th>Case Count</th>
<th>ALOS</th>
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<tbody>
<tr>
<td>Short</td>
<td>224.47</td>
<td>177 (61%)</td>
<td>1.27 (27%)</td>
</tr>
<tr>
<td>Medium</td>
<td>304.74</td>
<td>82 (28%)</td>
<td>3.72 (37%)</td>
</tr>
<tr>
<td>Long</td>
<td>302.86</td>
<td>31 (11%)</td>
<td>9.76 (36%)</td>
</tr>
<tr>
<td>Grand Total</td>
<td>831.78</td>
<td>290</td>
<td>2.87</td>
</tr>
</tbody>
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Short: 61% cases, 77 days

ICU Admission Model – Elective Cases

Short Stay Cases – Access Cap

Long Stay Cases

Fixed # Beds

Short: 61% cases, 27 days

Long: 11% cases, 36 days
Predicting ICU Discharge

Patients Waiting More than 2 hours* for a Transfer from the ICU to a Unit
Population: All inpatients transferred from BCC or BHII** to another unit

12/03/2010: PICU opened from BHII to

3/2/2011: PICU opened from 39 to

10/28/2010: Automatic Eye test page with

9/8/2011: PICU transfer order

*Wait time is determined from the time the transfer order is written until the patient arrives in their step-down inpatient unit.
**There are approximately 150 PICU transfers in a month. The sampling plan consists of ~25% of the transfers.

Critical Flow Failures

Delayed or Canceled Surgery Due to Bed Capacity

PICU Bed Not Available for Urgent Use

Patients who Utilize an ICU bed b/c an Appropriate Bed is Not Available

Psychiatry Patients Placed Outside of their Primary Unit
Mental Health Impact on Flow

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Discharge Prediction

- Various approaches to Discharge Management
- 1980’s – Keep it a Secret
- 1990’s – 2000’s Discharge goals
  - AM before 11 > 30-40%
  - “Shift” goals
  - 4 hour time block goals with prediction of “window”
- Reactive
- “Not Patient Centered”
- 2008 - Prediction
- 2013-14 – Discharge when Medically Ready
Discharge Prediction

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Timeline for DC when Medically Ready

- Criteria established at admission
- Nurse at bedside notifies service when Medical discharge criteria are met
- Discharge from floor in < 2 hours
- Review Length of Stay and Re-Admissions as balancing measures

Not about Speed – Now about Efficiency

KEY DRIVER DIAGRAM – Program Inception 2012

Project Name: Discharge When Medically Ready
Project Leaders: Karen Tucker, Angela Stastile, Diane Herzog, and Christy White

SMART AIM

- Increase percentage of all HM patients who have met Medical ready criteria who will be discharged within two hours of reaching that goal on A6S, A6N, AASW from 75% to 80% by June 30, 2014

GLOBAL AIM

- Productivity: Optimize use of facilities and staff and improve patient flow to achieve 20% greater utilization of existing assets by June 30, 2015

KEY DRIVERS

- Criteria for Medically Ready Defined at Admission
- Shared Ownership/Accountability and Buy-In Among Physicians and Nurses
- Communication regarding prediction of discharge and defined goals is ongoing through the hospital stay
- Potential Barriers to Discharge are Clearly Articulated and Mitigation Plans Established
- Performance by team is transparent
- Evidence of Preoccupation with Failure
- Clear expectations for Parents/Families

INTERVENTIONS (LOR)

- Agreement among HM attending and nursing staff of discharge criteria for order set diagnosis and general admissions (LOR 2)
- 16 PM Huddle discussion re: early discharges (LOR 2)
- 2:00 AM notification of patients ready for discharge (LOR 1)
- Performance Management (LOR 1)
- Standardized and modifiable order sets (LOR 2)
- Identify and Mitigate Plans:
  1. Transportation census-based (LOR 1)
  2. Pharmacy, priority lists (LOR 2), Outpt delivery to patient room (LOR 1)
  3. Consults, proactive evaluation (LOR 2)
  4. RT, process in PCU (LOR 1)
  5. Home Health Care
- Daily feedback reports to RNs and MD’s with ID and mitigation of process and outcome measure failures (LOR 2)
- Feedback of data by HM team in conference room and by email (LOR 1)
- Auto notification to resident team that patient has met all criteria (LOR 2)
EMR Discharge Criteria: Physician View

Physiologic Discharge Criteria for Pneumonia

Questions:

1. Fever trending downward
   - Accepted for at least 24 hours

2. Antibiotic regimen continued
   - Yes

3. Oxygen saturations greater than or equal to 91%
   - Yes on room air for 12 hours

4. No evidence of respiratory distress
   - Yes

5. Additional discharge criteria
   - Multiple response

Comments (F8): Click to add text

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Poster in Resident Conference Room

Resident Team Weekly Performance

<table>
<thead>
<tr>
<th>Week Start</th>
<th>HM Team #1</th>
<th>HM Team #2</th>
<th>HM Team #3</th>
<th>HM Team #4</th>
<th>HM Team #5</th>
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<td>1/6/2013</td>
<td>100% 79%</td>
<td>100% 92%</td>
<td>100% 100%</td>
<td>52% 72%</td>
<td>100% 87%</td>
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<tr>
<td>1/13/2013</td>
<td>100% 79%</td>
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<tr>
<td>2/3/2013</td>
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<td>4/14/2013</td>
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Green: 70-100%
Yellow: 50-69% of patients
Red: 0-49% of patients
Discharge when Medically Ready

Managing Discharge when Medically Ready
% Discharged within 2 hours of Medically Ready

All Units

Week Start Date (Patients Discharged)
- Goal
- Median
- UCL
- LCL
- % Discharged 2 hrs

Last Updated: 11/27/2016 by S. Heese, James M. Anderson Center for Health Systems Excellence

Service Level DC when Medically Ready

Managing Discharge when Medically Ready
% Discharged within 2 hours of Medically Ready - Surgery
Includes Surgery Service Patients

Managing Discharge when Medically Ready
% Discharged within 2 hours of Medically Ready - Medical
Includes Hospital Medicine, Community Pediatrics, Adolescent Medicine and Complex Home care patients
Discharge Failure Reasons Comparison

Balancing Measures – Length of Stay

Hospital Medicine Average Length of Stay
For patients with selected diagnosis
Balancing Measures – Readmission Rate

Hospital Medicine 30-day Readmission Rate
For patients with selected diagnosis

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<tr>
<td></td>
<td>Flow Safety Matching</td>
<td>Flow Failure Analysis, Predictive Risk Analysis</td>
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</table>
Prediction – Model for the Future

- **Static Analytics**
  - Performing a **ONE TIME** analysis of processes with historical data in order to **PREDICT** what’s going to happen under certain circumstances.
  - **Critical care Bed Modeling for Growth**

- **Real-Time Prediction**
  - Performing **ONGOING** analysis of processes with latest available data in order to continuously **PREDICT** what’s going to happen under certain circumstances.
  - **RN Bedside Nurse Staffing Model**

---

**Critical Care Bed Predictions**

- [Graph and chart showing bed utilization and patient waiting time]

Amy H. Arnedt, Division of Health Policy & Clinical Effectiveness
### Critical Care Bed Growth Analysis

#### YEAR 2-7 Forecasted PICU Bed Needs - Mid-Range/Most Likely

**Bed Needs for PICU - Probability of a Full Unit**

20 Simulations (34-43 Period Std Dev Max/Min) - Noin Probability

**POPULATION:** Unscheduled Medical/Surgical, BMT, ENT Airway ICU Elective Cases+ OR CAP=3

<table>
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<tr>
<th>Forecast Time Frame</th>
<th>Probability of Full Unit</th>
<th>PICU Beds</th>
<th>CICU Beds</th>
<th>ICU Bed Needs</th>
<th>Combined ICUs</th>
<th>Estimated Savings</th>
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<td>39</td>
<td>81</td>
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</table>

**Estimated number of beds required for given probability of the unit being full.**

**POPULATION:** Unscheduled Medical/Surgical, BMT, ENT Airway ICU Elective Cases, Heart Institute Patients
## Predicting Future Programmatic Needs

### ICU Bed Needs

Number of beds needed based on probability of having a full unit (5%, 2%, 1%, 0%) and the growth estimate.

<table>
<thead>
<tr>
<th></th>
<th>Low/Conservative</th>
<th>Mid-Range/Most Likely</th>
<th>High/Aggressive Growth</th>
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<tr>
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<td>1 Yr</td>
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<tr>
<td>2%</td>
<td>2</td>
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<tr>
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</table>

![Graph](image-url)
Predicted to Actual Pre-Op Bed Demand

Pulmonary demand appears to be in line with original projections

<table>
<thead>
<tr>
<th>Year</th>
<th>Predicted</th>
<th>Actual</th>
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<tbody>
<tr>
<td>Year 1</td>
<td>72.7</td>
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<tr>
<td>Year 3</td>
<td>88.0</td>
<td>176.6</td>
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<td>Year 5</td>
<td>230.7</td>
<td>473.5</td>
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<tr>
<td>Year 7</td>
<td>475.0</td>
<td>867.8</td>
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<td>Year 10</td>
<td>874.8</td>
<td>1505.4</td>
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</table>

Predicted to Actual ICU Bed Demand

ICU demand appears to be dependent on pre-transplant severity and much higher than originally anticipated

<table>
<thead>
<tr>
<th>Year</th>
<th>Predicted</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>23.9</td>
<td>348.5</td>
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<tr>
<td>Year 2</td>
<td>39.4</td>
<td>275.7</td>
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<tr>
<td>Year 3</td>
<td>54.9</td>
<td>65.6</td>
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<tr>
<td>Year 5</td>
<td>73.4</td>
<td>108.3</td>
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<tr>
<td>Year 7</td>
<td>107.4</td>
<td>155.3</td>
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<tr>
<td>Year 10</td>
<td>166.9</td>
<td>183.1</td>
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</table>
Predicted to Actual Cardiology Bed Demand

<table>
<thead>
<tr>
<th>Year</th>
<th>Prediction</th>
<th>Actual</th>
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</thead>
<tbody>
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<td>Mid Level</td>
<td>48.2</td>
</tr>
<tr>
<td>Year 2</td>
<td>25.2</td>
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</tr>
<tr>
<td>Year 3</td>
<td>125.9</td>
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<td>Year 4</td>
<td>55.6</td>
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<tr>
<td>Year 5</td>
<td>41.1</td>
<td></td>
</tr>
<tr>
<td>Year 6</td>
<td>154.4</td>
<td></td>
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<tr>
<td>Year 7</td>
<td>78.1</td>
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<td>Year 8</td>
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<td>Year 9</td>
<td>155.1</td>
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</tr>
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<td>Year 10</td>
<td>353.5</td>
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<tr>
<td>Year 11</td>
<td>207.8</td>
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<tr>
<td>Year 12</td>
<td>356.6</td>
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</tbody>
</table>

Cardiology demand appears to be lower than original projections.

Predicted to Actual Post-Op Floor Demand

Outpatient / Procedural Demand

LUNG TRANSPLANT OUTPATIENT DEMAND PROJECTIONS

James M. Anderson Center
For
Health Systems Excellence
Outcomes and Observations

- Environmental Impact Assessment provided valuable information allowing for assessment and agreement across the hospital before program was initiated
  - Answer questions about patient flow and placement
  - Assess potential stress on existing resources
  - Quantify demand and capacity needs (staffing, beds, outpatient clinic rooms, PFT demand, OR demand)

- Requires assumptions and research for new programs

- As always – your results are only accurate if your assumptions are correct

Staffing and Environment - Mortality

Nurse Staffing and Hospital Mortality

- Tertiary Medical Center – 197,691 patients, 176,696 RN shifts, 43 hospital units
- Relationship between nurse staffing and patient turnover
  - Risk of Death ↑ 2-3 % for each below target shift
  - Risk of Death ↑ 4-7 % for every high turnover shift
    - Admissions, discharges, and transfers
  - Risk of Death ↑ 12 % for each below target shift
  - Risk of Death ↑ 15 % for every high turnover shift

- Independent Variables when considering risks
Census Calculation

Tomorrow’s census =

Today’s census + Today’s admissions – Today’s discharges

Easy enough, right?

Developed more than 200 models:

17 units, 7 days a week, admissions, and discharges, multiple input and output streams

---

Model Outputs

<table>
<thead>
<tr>
<th>Wednesday</th>
<th>PCCU</th>
<th>NICU</th>
<th>NICU</th>
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<tr>
<td>7/21/15</td>
<td>14</td>
<td>24</td>
<td>18</td>
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<td>Total Capacity (of Beds on Unit)</td>
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<td>29</td>
<td>18</td>
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<tr>
<td>Scheduled Admits</td>
<td>24</td>
<td>21</td>
<td>17</td>
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<tr>
<td>Predicted Admits</td>
<td>36</td>
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<td>Predicted Discharges</td>
<td>74</td>
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<td>Predicted (demand)</td>
<td>57</td>
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<td>Predicted Overflow</td>
<td>17 (MRT)</td>
<td>1 (ABG)</td>
<td>7 (MRT)</td>
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<tr>
<td>Predicted Unit Census</td>
<td>58</td>
<td>65</td>
<td>47</td>
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</table>

←Available bed capacity
←Midnight census
←Scheduled admissions
←Predicted admissions
←Predicted discharges
←Predicted demand (census + adm – disch)
←Predicted overflow placement
Staffing Prediction – Proactive Planning

Today's Predictions

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<th>HI</th>
<th>NKU</th>
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<th>CBOH</th>
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<td>ANH</td>
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</table>

Actual vs. Predicted Results

BSCC (PICU) (Actual vs Pred)
**Impact of Analytics**

- Bed demand predictions facilitate staffing and overflow planning – right patient – right team
- ED admit predictions improved from 40% to 70% accuracy – resource allocation
- Encourages staff to more consistently predict and document estimated discharge date, which helps guide care – system efficiency
- Uncovers scheduling issues – efficiency and access
- One-stop source to determine where there is capacity (or lack thereof) to add services (infusions, etc.) – efficiency and utilization

---

**Key Drivers for Capacity Management**

<table>
<thead>
<tr>
<th>IHI Drivers</th>
<th>CCHMC Initiative</th>
<th>Operations Possibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shape / Reduce Demand</td>
<td>Predictable Care Delivery</td>
<td>Evidence Based Best Practices, Analysis of ALOS and outliers, Standardize then Customize, Eliminate unnecessary care</td>
</tr>
<tr>
<td></td>
<td>Management of Variability</td>
<td>Identify Patient Streams – Inpatient/Outpatient/OR Manage System Variation</td>
</tr>
<tr>
<td>D/C Match</td>
<td>Optimization of Flow Delivery</td>
<td>Placement initiatives – D/C Matching plans Discharge prediction and planning, Home Care, Parent Initiatives</td>
</tr>
<tr>
<td></td>
<td>Capacity Prediction</td>
<td>Integration of simulation modeling and planning “Environmental Impact” Reports for growth programs</td>
</tr>
<tr>
<td>System Re-Design</td>
<td>Capacity Management</td>
<td>Simulation for design and patient placement “Environments Impact” Planning</td>
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<tr>
<td></td>
<td>Flow/Safety Matching</td>
<td>Flow Failure Analysis, Predictive Risk Analysis</td>
</tr>
</tbody>
</table>
GARDiANS

Hospital Wide System for Safety

3 Times - Every Day

Individual Room / Floor / System Predictions – Capacity and Safety

Floor Huddles  PeriOp Huddle  Outpt, Home, Psych  ED Huddle  ICU Huddles

Institutional Wide Bed Huddle – Capacity Management

Institutional Daily Operations Brief

System Prediction – Mitigation Strategy
Flow Dashboard – Sites of Care

Patient Satisfaction

- Only 3-4% of 1 Million outpatient visitors rank our care in the lower half (0-6 of 10 pts)
  - 35,000 patient per year

Great American Ballpark 42,319
Paul Brown Stadium 65,535
Understanding Outliers

I thought:

If I can get 80-85% of this under good control, that will solve at least 85% of the problem.
Observations on Outliers

- In these predictive models, it is important to be right. What is really important is the cumulative magnitude of your errors.

- The “errors” are often the result of “big surprises”, not multiple small issues.

- Failure to meet the predictive model leads to progressive and increasing cumulative error, things rarely get better fast (the more you are off, the more you are off.)

- It is hard to offset the “surprise” errors with great prediction of the expected.
Lessons Learned

- Building “Will” to work on Flow is a challenge
  - When it works, it is not on anyone’s radar
  - If it works for me, your problem is not my problem….
  - When it does not work, somebody else should solve it
- Linkage Safety and Flow
- Speed vs Efficiency
- Work Backwards not just Forward
- Embrace Mathematics and Analytics
- Standardize processes and work flows

Make it Personal

- Don’t let the Data Drown out the Dream
- Stories not Statistics
- Names and Faces
- Accountability is Personal & Group Responsibility
- Collective Mission/Vision
Thanks!