



University of Michigan  
Health System

# A3 Thinking in an Academic Medical Center

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## *Managing the Fire in the Fireworks Factory*

**Jack Billi, M.D.**  
Associate Dean for Clinical Affairs

**Dave Morlock**  
CFO, University Hospital and Health Centers  
University of Michigan

**jbilli@umich.edu**  
Michigan Quality System:  
**[med.umich.edu/mqs](http://med.umich.edu/mqs)**

### **Michigan Quality System:**

- **Quality**
- **Safety**
- **Efficiency**
- **Appropriateness**
- **Service**

# A3 Learnings

## From the Fireworks Factory - 1

- Creating the A3 encourages systematic problem solving
- Presenting the A3 fosters consensus, commitment to move forward
- Discussing the A3 fosters critical analytic skills, communication, respect
- The conversations fostered by the A3 are important, not the paper or the format
- The consensus on the A3 gives the authority to take action

## A3 Learnings

### From the Fireworks Factory - 2

- As a result, a group reaches consensus on:
  - What is the problem?
  - Who owns the problem?
  - Why is this problem important? The ugly picture.
  - What are our goals?
  - What are the root causes?
  - What strategies are likely to overcome the root causes?
  - What plan will we use to try the strategies?



# Background Materials

- UMHS and the Michigan Quality System
- Strategic goals
- MQS House
- Learning the A3 at UMHS
- A3 Analogies in Medicine and Science
- Evolving uses of A3 at UMHS
- Observations on A3 use from “gemba”
- Lessons learned
- Materials used in teaching A3 use at UMHS



# University of Michigan Health System in One Slide

Integrated Academic Health System,  
within major public research university:

- UM Hospitals and Health Centers
  - 817 beds, 44,000 admissions
  - 1.6 million outpatient visits, 100 clinics
  - 10,000 employees
- UM Medical School
  - 1600 faculty physicians
  - 1000 resident physicians
  - 700 medical students





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# Mission Synergy



**Patient  
Care**



**Education**



**Research**



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# Mission Synergy in Lean



**Patient Care:**  
*Work Adds Value*

**Education:**  
*Work As Learning*



**Research:** *Work As Discovery*<sup>7</sup>





# Michigan Quality System

- A health system-wide, *consistent* approach to quality and process improvement
- Goals – to improve:
  - ***Quality***
  - ***Safety***
  - ***Efficiency***
  - ***Appropriateness***
  - ***Service***
- To Deliver:
  - ***The Ideal Patient Care Experience***
  - ***The Ideal Faculty and Staff Experience***





**Michigan Quality System**

A uniform process improvement approach to transform waste into value from the customer’s perspective by enhancing:

<b>Quality</b>	<b>Safety</b>	<b>Efficiency</b>	<b>Appropriateness</b>	<b>Service</b>
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**Targets/Results**

- **SERVICE:** Patient satisfaction mean scores on “care experience” at or above 90
- **FINANCIAL:** Operating margin at 3% or better
- **QUALITY CARE:** Quality and safety measures at or above the 90<sup>th</sup> percentile of select benchmarks
- **ACADEMIC:** All Graduate Medical Education programs will have five-year accreditation; 10% annual increase in clinical research funding
- **PEOPLE:** Faculty/employee satisfaction scores will improve by 10%
- **COMMUNITY:** Partner with the community to improve the health of the population



**Major Areas of Focus**

1. Improve access and maximize capacity in all our patient care areas
2. Enhance clinical quality and safety performance
3. Enhance key workforce planning strategies
4. Increase parking and transportation options for employees
5. Improve ambulatory care experience in partnership with the Faculty Group Practice
6. Improve the customer experience



**Michigan Quality System**  
**Safe - Effective - Efficient - Patient-Centered - Timely - Equitable Health Care**

**Just-in-Time**

Using the fewest resources to consistently deliver appropriate care

*Right Care,  
Right Time,  
Right Setting*

**Leveled Workload**

**Ideal Patient Care Experience**

An illustration of a doctor in a white coat sitting at the side of a hospital bed, attending to a patient. A bedside table with a vase of flowers is next to the bed.

**Continuous Improvement (P-D-C-A) and Learning**

**Built-in-Quality**

**Error-Free**

A red octagonal sign with a white border, featuring a white hand with the index finger pointing up, similar to a 'no left turn' sign.

**Don't Make, Accept, or Send on an Error!**

**Standardized Work**

**Make Value Flow by Eliminating Errors and Waste**



## How UMHS leaders learn to use the A3 to foster structured problem solving

- Learning by doing – guided practice in 3 roles:
  - Create your A3 (owner) – to structure your thinking and problem solving – gemba, broad input
  - Present your A3 – to help others understand and reach consensus on problem’s importance, root causes, countermeasures and plans to improve
  - Question, probe, clarify – with respect
- Practice in our 4 day Lean Health course
  - “Students” in teams create an A3 on their real work problems, present it, and respond to questions from the group
  - Faculty mentor the creation, the presentation, and the Q&A
  - Demonstrate opportunities:
    - to “go and see”, “ask why”, “respect people”
    - to ask troubleshooting questions: What is the problem? Who owns the problem? What is the plan?...

## *“A3 Thinking” in Many Fields*

- Many professions use standard formats to present information
  - Physicians use a standard format for communicating a patient’s history and physical exam, their impression and plans
  - Scientists use a structured abstract, standard format for presentations and research reports
- These standard formats facilitate clear communication, dialogue, detailed debate and building consensus



# Medicine's "History and Physical"

## - *A form of A3 Thinking*

- Date, clinical service and site
- Chief complaint
- History:
  - History of present illness
  - Past medical and surgical history, medications and allergies, social and family history
  - Review of systems (with its own order)
- Physical exam
  - Vital signs, general appearance
  - HEENT, cardiovascular, pulmonary, abdomen, extremities, skin, neuro...
- Impression or assessment
- Plans (diagnostic, therapeutic, other)
- Author (clinician's name, number)



# Scientific Communications

## *- A form of A3 Thinking*

- Scientific papers:
  - Standard order to structured abstract, presentations, posters, and published research reports
  - Headings vary by journal – format usually includes
    - Title, Author (owner), Date, Citation
    - Background (why this problem is important)
    - Objective/Hypothesis
    - Design/Methods
    - Setting/Participants/Measurements
    - Results
    - Conclusions/Limitations
    - Implications, follow up, next steps...



# Evolving Uses of A3 at UMHS

## To Foster Dialogue and Build Consensus

- Problem Solving
  - Hospital annual operating budget discussions
  - 10 year Strategic Financial Plan discussions
  - Planning the Lean Transformation in Ambulatory Care
  - Advanced Medical Home taskforce
  - “Organized Systems of Care” for a Regional Quality Consortium
  - Fourth year medical students’ project analysis (1 month elective)



# Evolving Uses of A3 at UMHS

## To Foster Dialogue and Build Consensus

- Proposals
  - Major clinical expansion in a geographic region
  - Capital project review (\$61M in requests v. \$26M available)
  - Requests for central lean coaching resources
  - Creation of a claims data warehouse for Michigan physician organizations
  - Proposal to health system's senior leadership to use A3s to track progress on top 24 objectives
- Status Reports
  - Health system's senior leadership tracks progress on top 20 objectives (e.g., Discharge Appointments)





# A3 Observations from Gemba (UMHS)

- Most lean tools cascade responsibility (andon, kanban, standard work, visual controls, error proofing, VSM...). A3 does too.
- A3 fosters conversation:
  - consensus building
  - focuses discussion around facts
  - if not known, fosters "go and see, ask why, respect people"
- While creating an A3 and during the dialog it fosters, the owner often changes his/her mind, *about a lot of things*
  - This plan won't achieve the strategy...
  - This strategy won't address the root causes...
  - These are not the most important root causes of the problem...
  - This is not the right problem...
  - Who owns this problem? (email system)



# Observing Evolution at UMHS: Lessons Learned During A3 Spread

***“A plan is an experiment you run to see what you don’t understand about the work.” (paraphrase Steven Spear)***

*We are just starting to learn:*

- Beware A3s without the conversations
  - Fire in the fireworks factory
  - \*\*\*Structure A3 use around business tasks – conversations cascade responsibility, create clarity, build consensus & commitment
- Not enough gemba – debates on hear-say
  - “I suspect... In my opinion... In 2003 we had... I’ve always said...”
  - Too much conjecture, anecdotal, dated, biased information v. fact
  - \*\*\*Opportunities to “go and see, ask why, respect people” (Fujio Cho)
  - \*\*\*Discuss A3 in gemba
    - the real place where the real people do the real work



# Observing Evolution at UMHS: Lessons Learned During A3 Spread

- Too many words, not enough graphs, charts, maps, facts
  - Folks think they need to be self-contained, self administered
  - \*\*\*We need to model more charts, fishbone, Pareto...
- Not presenting the whole A3
  - Owner: “Let me just talk about the problem”
  - Interruptions to debate the content
  - \*\*\*Ground-rules, model respect
- The waste of overprocessing
  - “It took me more time to format than to create the content”
  - \*\*\*Keep the focus on the thinking and discussion, not the format
- For some A3 is “required”, not driven by owner need
  - “I was told it had to be on an A3, so I fit it into the format”
  - \*\*\*Owners describe their experience, success, changed thinking, consensus



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# A3s in Handouts

1. Service Excellence Proposal
2. Duplicate Registration Number Project
3. UH Operating Room Smoothing Project
4. Ambulatory Care Services Lean Transformation Plan
5. Cardiovascular Center Information System Proposal
6. UM Home Care Services Proposal
7. Failure to Obtain Appropriate Consent as a Cause of OR Delay
8. Fostering SMT Use of PDCA Cycles for Strategic Plan Deployment
9. Improving Patient Flow By Reducing Hospital Readmissions Through Patient Involvement (Discharge Appointments)
10. FY 08 Hospital Annual Operating Budget
11. Support Strategy with Capital Spending that Fits in Reasonable Earnings and Prudent Cash and Debt
  - 10 year strategic financial plan – initial
12.
  - 10 year strategic financial plan – revised



# Materials used in teaching A3 use at UMHS

- Elements of A3 Learning Model at UMHS
  - Definitions
  - Benefits
  - Instructions
  - Template

# A Format for Planning and Proposing: “A3 Thinking”

- “A3” is just a paper size (international 11 x 17)
- A3 planning began in the 60s as the Quality Circle problem-solving format.
- At Toyota, it evolved to become the standard format for problem-solving, proposals, plans, and status reviews.
- What is important is not the format, but the process and thinking behind it, and the conversations it facilitates.
- An A3 lays out an entire plan, large or small, on one sheet of paper.
- It should be visual and extremely concise.
- It should tell a story, laid out from upper left-hand side to lower right, which anyone can understand.

## A3 Benefits

- As a standard process, it becomes easier for you
  - to persuade others and to understand others.
- It fosters dialogue within the organization.
- It develops thinking problem-solvers.
- It encourages front-line initiative, cascades responsibility and clarifies who is responsible for problems or steps.
- It exposes lack of agreement that can undermine plans.
- It encourages PDCA (Plan, Do, Check, Act).
- It forces “5S for information.”
- It clarifies the link between problems, root causes, and countermeasures.
- It serves as an organizational learning tool.
- It leads to effective countermeasures and solutions based on facts and data.

# A3 Thinking

The purpose of the A3 process is to:

- structure effective and efficient dialogue to
- foster understanding followed by agreement.

## Creating an A3

Imagine clearly the *story* of the proposal you want to make, the improvement you want to initiate or the problem you want to solve.

The A3 need not have every word or fact. It is almost always presented live, without interruption, in 10 minutes or less. If in a group, have copies to write on.





# A3 Outline (Boxes)

1. Title, theme, owner, draft date
2. Background
3. Current situation, Current State Map
4. Goal or target
5. Investigation of facts, analysis, root cause analysis
6. Recommendations, countermeasures, strategies, alternatives
7. Action Plan – what, who, when
8. Verification of countermeasures
9. Review/Critique
10. Possible next steps, further action, follow up

Create about five to seven boxes, combining the appropriate above items to make your story as simple and clear as possible.

Adapted from John Shook

# Which Tool Could Be Used ...

- Each item (box) should contain a *graph, chart, or sketch*.
- Use words only when a *graph, chart, or sketch* cannot show the details of the contents, or it is impossible to explain the contents with them.

BACKGROUND	Graph	Sketch
INVESTIGATION	Tally-sheet	Histogram
CURRENT STATE	Pareto Diagram	Graph
	Scatter Diagram	Sketch
	Control Chart	CS Map
TARGET, OUTCOMES	Chart	Sketch
ACTION PLAN	Gantt Chart	
ANALYSIS	Cause-and-Effect Fishbone	Control Chart
	Relation Diagram	Histogram
	Tree Diagram	Graph
	Pareto Diagram	Sketch
	Scatter Diagram	
COUNTERMEASURES	Graph	Chart
	Sketch	FS Map
VERIFICATION OF COUNTERMEASURES	Pareto Diagram	Graph
	Histogram	Sketch
	Scatter Diagram	Chart
PREVENTIONS	Sketch	Chart
REVIEW/CRITIQUE		

Title: **What we are taking about.**

### Background

***Of all our problems, why are we talking about this one?***

Historical/organizational/business context...

### Current Situation

***Where do we stand?***

Current state value stream map, current gap...

### Goal

***What is the specific change you want to accomplish now?***

### Analysis

***-What are the root causes of the problem?*** Fishbone, 5 Whys, Pareto

***-What requirements, constraints and alternatives need to be considered?***

Date:

Owner:

### Recommendations

***What are your proposed countermeasures, strategies, alternatives?***

### Plan

***What activities will be required for implementation and who will be responsible for what and when?***

### Follow - up

***How we will know if the actions have the impact needed? What remaining issues can be anticipated?***

# A3 UMHS DOES NOT MEET TARGETS IN OVERALL SATISFACTION RATINGS

Owners: Childs, Ellis 2/14/2008

## BACKGROUND:

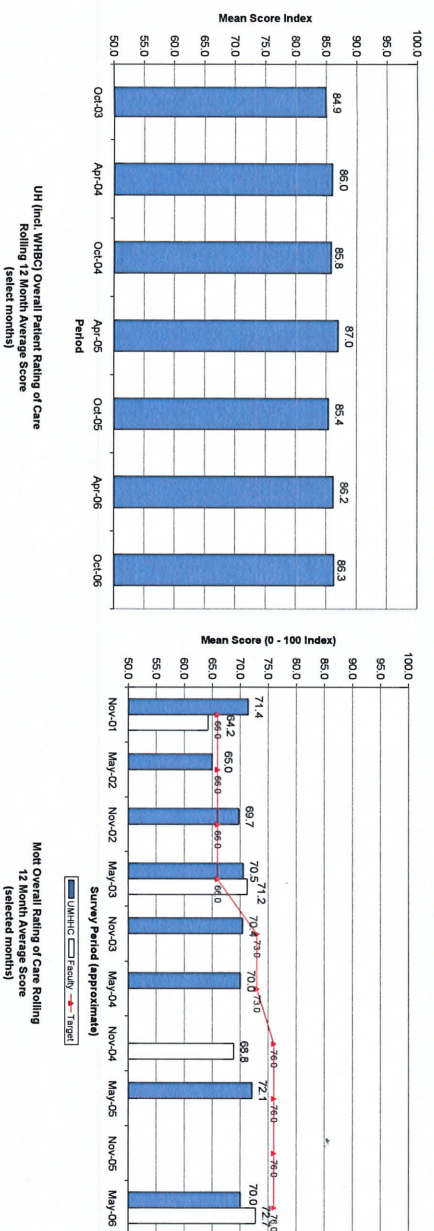
- Weak service leads to dissatisfaction among patients and staff
  - Patients go elsewhere
  - Revenue is lost, advertising expenses increase
  - Staff turnover/recruitment expenses soar
  - Waste (muda) of retraining
- Strong competition in healthcare market
  - St. Joe expanding; Providence, HFH, Beaumont encroach
  - Michigan economy poor, people leaving, reduces demand
  - “Captured” M-Care market ending
  - Employers, patients seeking economy, quality, service
- Patient choice increasing factor
  - Care Choices sold, may be opportunity
  - Patients pay out-of-pocket (includes HSA, etc.), therefore choosy, price-sensitive
  - Patients better informed, increasing expectations; generation Y will want high service

- High demand for our services
  - Increases stress
  - Shows up service problems
  - Good time to work on service when busy, not when desperate for work
- Svc programs have increased pt & staff satisfaction
- Service Excellence is the *right thing to do*

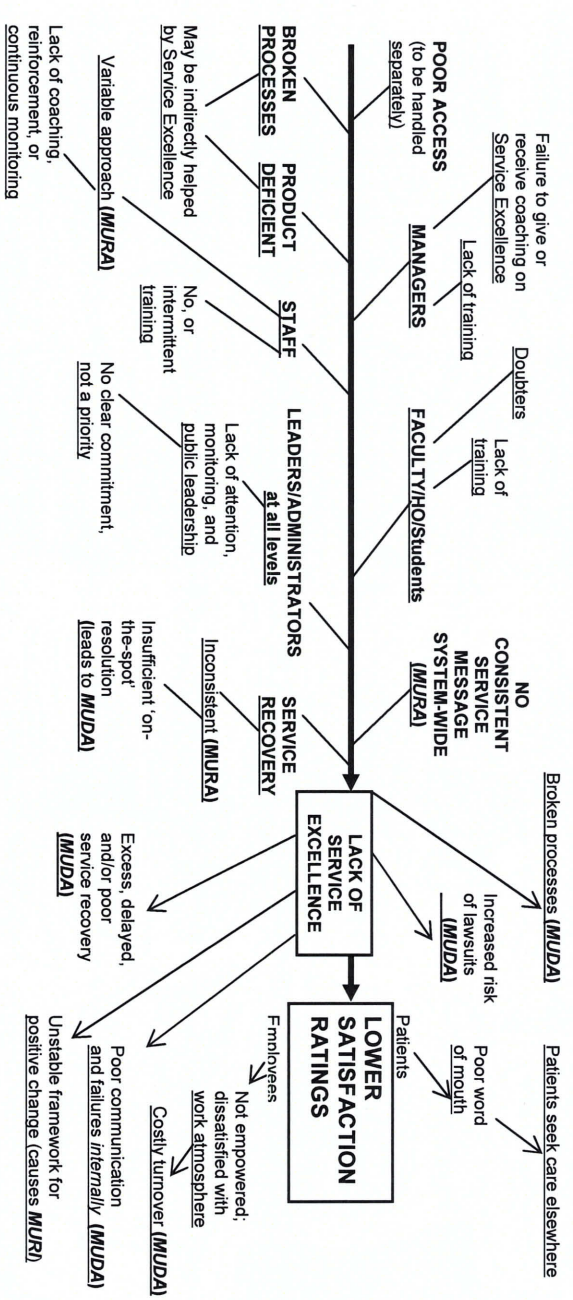
## CURRENT SITUATION:

- UMHS working toward Ideal Pt Care Experience
- Variability in patients' customer experiences
  - May relate in part to point of access
- Variability in employees' customer experiences
- Variable training in Service Excellence
- Variable Service factors (P/F centered care, etc.)
- Failure to capture what our patients/staff want
- Employee/patient satisfaction scores, all under target
- Overall patient ratings: adult hospital: ~50<sup>th</sup> UHC percentile; Mot: 25<sup>th</sup> percentile

Initial Overall Metrics Selected  
Note: Axis scales vary across graphs



## ANALYSIS:



## GOALS:

- To create the ultimate patient/customer experience
- To ensure that staff-patient interactions, processes, facilities, amenities and aesthetics promote health and well-being
- To design a Michigan difference strategy to be implemented health system wide
- UHC #1 in patient satisfaction
- 90% *excellent* patient satisfaction in care experience
- Patients willing to recommend > 90%
- Referring physician satisfaction > 90%
- Employees willing to recommend > 90%
- Faculty satisfaction with service > 90%
- Join employer of choice national list
- > 5 requests/mo from other hospitals to visit

## RECOMMENDATIONS:

- All top leaders commit to Service Excellence
  - Svc Ex always on agenda & constantly paying attention to it; dashboard of old and new service monitors made a priority
  - Top leaders break down silos for standard Svc Ex approach
- Part of performance evaluation (including all leaders)
- Form Service Leadership Team (Director, advisory group); align with MQS (Lean) approaches; reports to senior leader
- Middle managers instructed, then charged with implementing, coaching, and continuously monitoring for service excellence
- MQS projects incorporate Service Excellence Standard
  - Develop system-wide Service Excellence Standard
  - Adjustments when required by work product
  - Roll-out method and materials to initial learning units
  - Eventually to all units; train and maintain
- Service strengths used in employment decisions across all venues
- Set up efficient, uniform training for new hires
- Set up reinforcement programs
- Allocate funding for programs

## PLAN:

- |   |                        |  |
|---|------------------------|--|
| Obtain HS leadership agreement (HSEG)                   | May 07                 | Ellis, Childs                          |
| Propose overall and 'drill-down' metrics (see App. 1)   | May 07                 | Ellis, Childs, MQS Prioritization Cmte |
| Recruit Director (Champion) of Svc Excellence (DSE)     | Fall 07                | Denton, Billi                          |
| Evaluate regional, national Service exemplars           | Fall 2007              | DSE, OED                               |
| Initiate Change Strategy, Nemawashi (see Appendix 1)    | 3 <sup>rd</sup> Q 08   | Org. Effectiveness & Diversity (OED)   |
| Initiate change in initial units, ask 5 Whys of service | 3 <sup>rd</sup> Q 08   | Director of Svc Excellence (DSE), OED  |
| Units: Value stream map, coaching; roll-out             | 1 <sup>st</sup> Q 2009 | DSE, OED                               |
| Assess service on trained Units, adjust plan            | 2008                   | DSE, OED                               |
| Continue Roll-out                                       | Now & forever          | DSE, OED                               |
| Monitor satisfaction scores                             | 2008 & forever         | DSE, OED                               |
| Assess Service on empl. performance evaluations         | 2008 & forever         | Supervisors                            |

## FOLLOW-UP:

MQS meeting December 2007

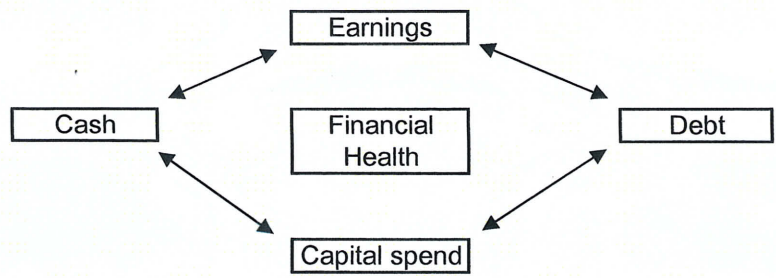
# A3 Strategic Financial Plan

Owner: Morlock

Date: 10/31/07

**Problem: Support strategy with capital spending that fits in reasonable earnings estimates and prudent cash & debt**

All of these elements are inter-related.



Changes in one element impact the others.

## CURRENT SITUATION

	Days Cash	Debt/Cap	Oper Mgn
UMHHC FY07	370	22.6%	3.9%
Aa Moody's	246	32.7%	4.3%
Our USNWR Rank	1	4	5

We have strong financial condition and adequate financial performance

## ANALYSIS - Stress on earnings

Shift to govt payers where profits are eroding

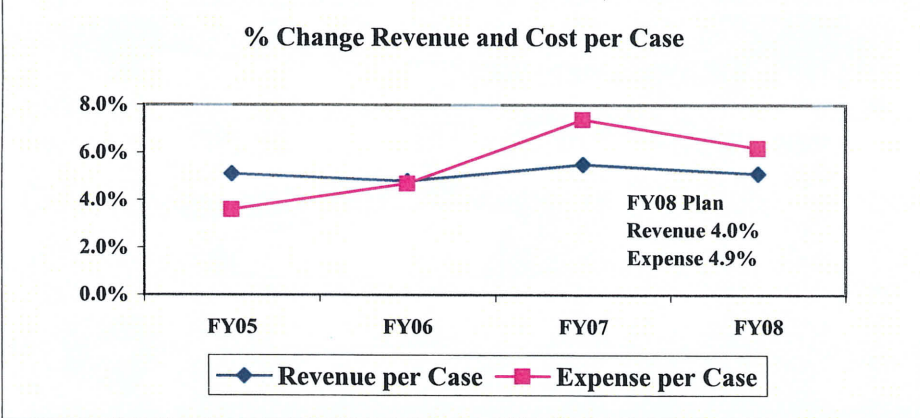
Payer mix shift	FY03	FY07
Private payers	60.9%	55.8%
Govt payers	39.1%	44.2%

Margin shift	FY03	FY07
Private payers	11.7%	21.2%
Govt payers	-8.7%	-18.8%

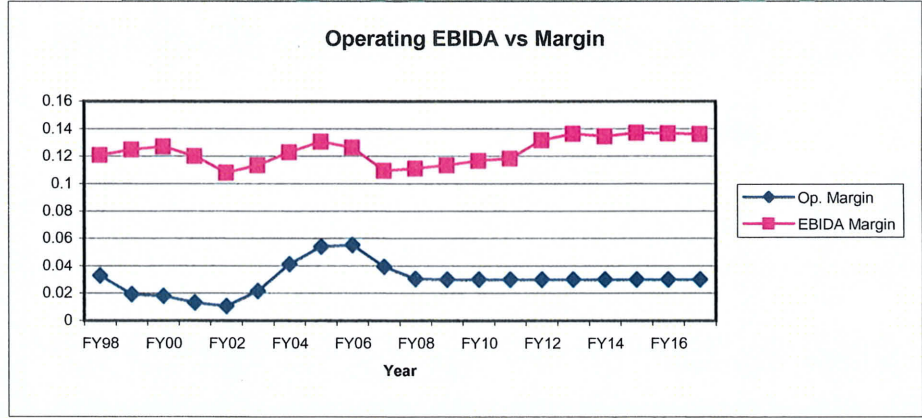
Examples of vulnerable \$ in govt hands	
GME / IME	\$76M
MACI/QAAP	\$24M
DSH	\$16M

The government represents over a half billion of our revenue. A 1% drop in a half billion = \$5M.

This graph shows an unsustainable situation.



This graph projects sustained record cash profitability.



A 3% operating margin assumption requires sustained record cash flow earnings, in the face of negative long term payer mix trend, constrained government spending, and bad state economy. Additional capital investment puts further strain on margins. Expense growth can not be allowed to exceed revenue growth.

## ANALYSIS - How much debt?

	HHC FY07	Moody's Aa
Debt / Cap	22.55%	32.70%
Cushion Ratio	66.2	25.6
Debt Svc Cover	19.32	6.8

We can borrow another \$500M and stay well within ratios.

## Philanthropy

C&W	\$75
Other	\$100
<b>Total</b>	<b>\$175</b>

This is \$50M higher than last year. We have \$56 for C&W already. Is \$175 conservative? Aggressive?

## Medical School Investment

Partnership Funds	\$243
Faculty Salaries (\$17M x 3 yrs)	\$51
Corporate Overhead	\$100
Recruiting Packages	\$88
Cancer Center Tier III	\$124
Other	\$121
<b>Total</b>	<b>\$727</b>

We should do a UMHS-wide model with all sources and uses of capital.

## Key modeling assumptions

IP growth rate	2%
OP growth rate	9%
Occupancy range	81% - 89%
Rev per case CAGR	2%
Exp per case CAGR	2%
Ending bed need:	1000 < X > 1100
Days Cash	mostly at or above AA
Debt to capital	at or below AA
Capital spending ratio	134%
Average size of budget challenge	\$52M

Assumptions are reasonable, but size of the annual budget challenge is worrisome. We'll also need capital investment beyond currently approved projects to hit these targets.

## Strategy should inform capital investment

	% of IP local & SE MI	% of IP out state & out of state
Scenario X	75%	25%
Scenario Y	81%	19%
Scenario Z	83%	17%
Current	81%	19%

## Capital spending options

Brighton	\$80
Chelsea	\$50
C&W Clinics and equipment	\$80
EPCE / ACIS	\$211
C&W Shelled Space Build-out	\$100
Bed Tower	\$200
East Mechanical Bldg Replace	\$20
addtl Amb Care Expansion	\$237
ED Expansion	\$20
ED Peds to C&W Backfill	\$10
Faculty Office Building	\$75
OR Reconfiguration	\$35
Wall Street Enhancement	\$64
Wall Street Campus People Mover	\$10
UH Kitchen Remodel	\$15
<b>Total</b>	<b>\$1,207</b>

## Capital Plan

	FY 08 - 10	FY 11 - 13	FY 14 - 17	Total
Routine capital	\$341	\$382	\$606	\$1,329
Beds 8D, 4D, 7A	\$10	\$0	\$0	\$10
C&W	\$385	\$108	\$0	\$493
Mott backfill	\$0	\$20	\$0	\$20
Eye & Diabetes	\$45	\$0	\$0	\$45
Imaging expansion	\$38	\$0	\$0	\$38
Lab building	\$0	\$100	\$0	\$100
Lab backfill	\$0	\$0	\$20	\$20
CareLink	\$12	\$0	\$0	\$12
EPCE	\$14	\$0	\$0	\$14
Data Center	\$51	\$0	\$0	\$51
Data Ctr backfill	\$0	\$10	\$0	\$10
CIF	\$16	\$18	\$28	\$62
<b>Addtl investment</b>	<b>\$20</b>	<b>\$140</b>	<b>\$536</b>	<b>\$696</b>
<b>Total</b>	<b>\$932</b>	<b>\$778</b>	<b>\$1,190</b>	<b>\$2,900</b>

Last year total = \$2,676

## Conclusions

We need to decide on investments for next 3-5 years. Plans in out years will change based on circumstances. Some investments for next few years will happen regardless of longer term strategy.

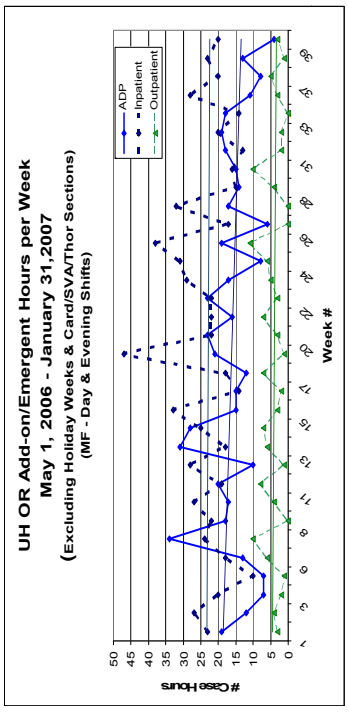
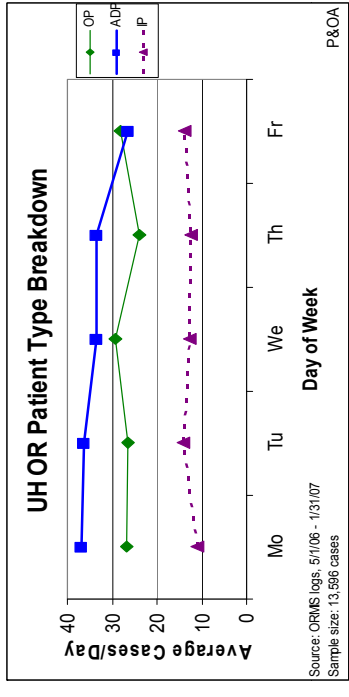
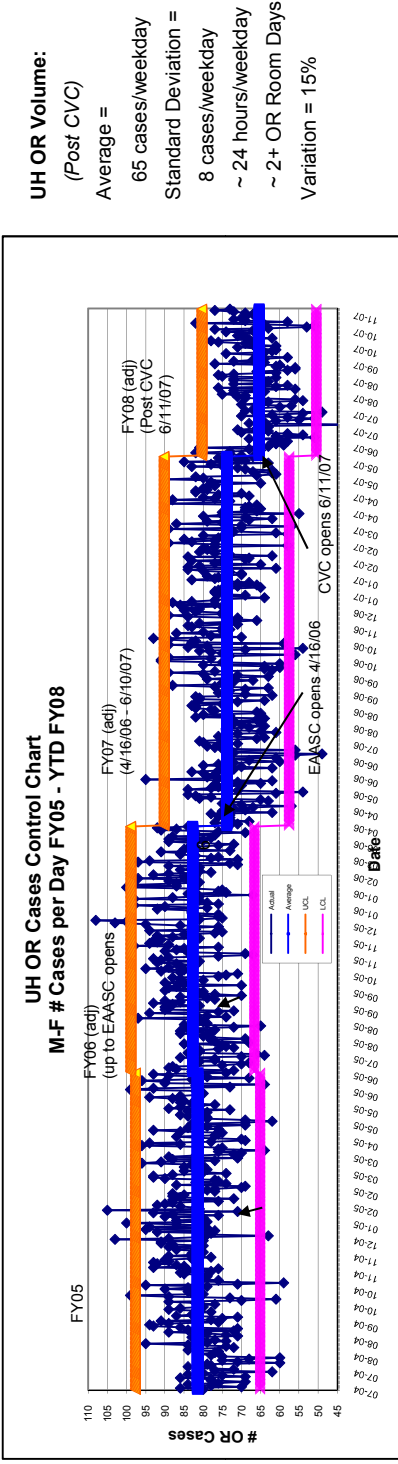
Operating costs constrain capital spending more so than cash or debt. Recent history with big projects (CVC, EAA, OMP) indicate large expense increases greater than just volume and inflation. Cost control is our limiting factor. Expense can't grow faster than revenue. If it does at the same time we make these big capital investments, then we're headed for financial trouble.

The lines of the SFP should not be used as a funding pools. This is not a budget. It's a directional financial map.

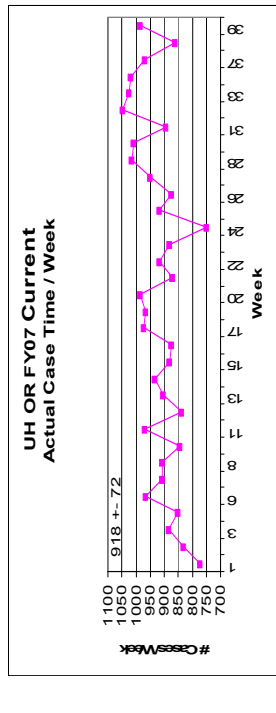
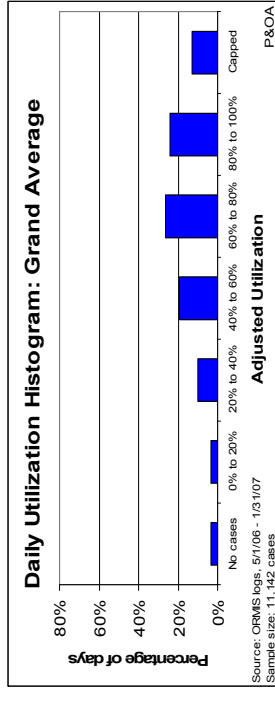


**Our Goal:** Reduce variation in OR schedule and costs by over \$500K.

**Challenge:** Surgeons want predictable block time, but need flexibility for a variety of factors that effect supply and demand.

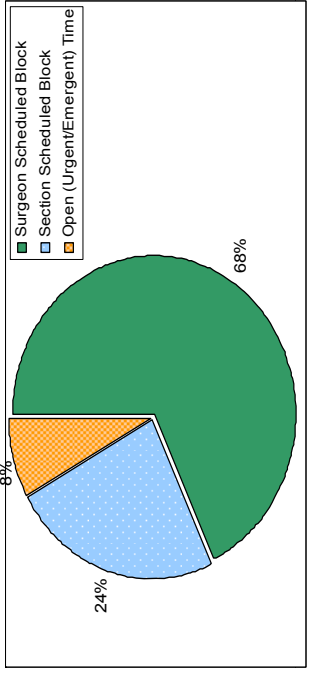
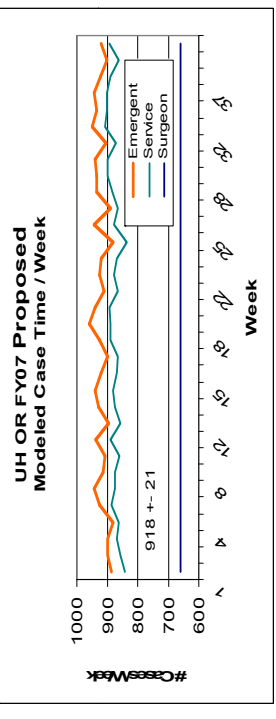
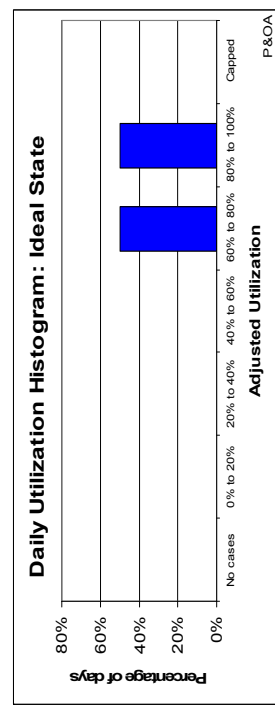


**General Issue:** Experience holes on some days and unplanned evening hours on others.



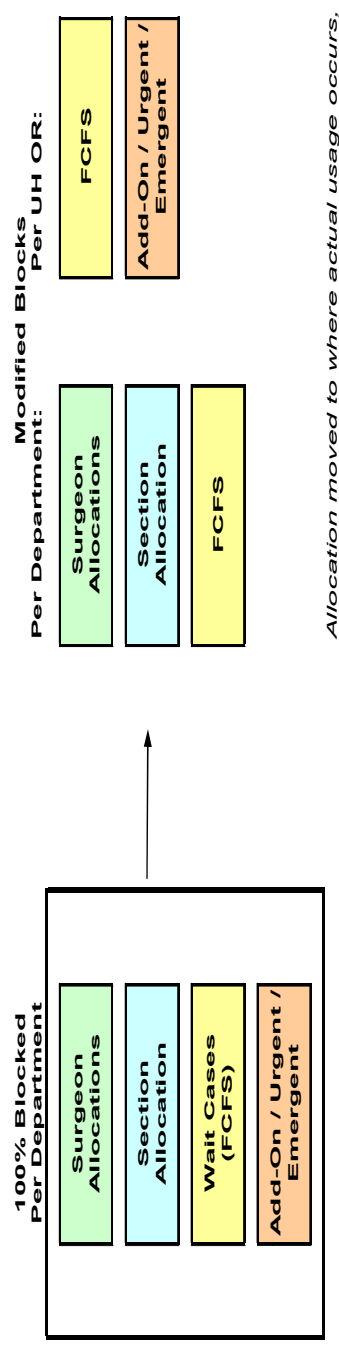
Current: 100% Blocked to Service & Surgeon (meaning if Surgeon has Monday's that's their day regardless)

move to



**Plan:** Create modified block schedule using simple deterministic mathematical modeling.

## 100 % Block to Modified Block Schematic



*All allocation per department. Allocation moved to where actual usage occurs, for blend of predictability & flexibility.*

**Check:** Develop standardized block schedule and tracking of performance.

Implementing new **standardized** Block Policy across all sites.

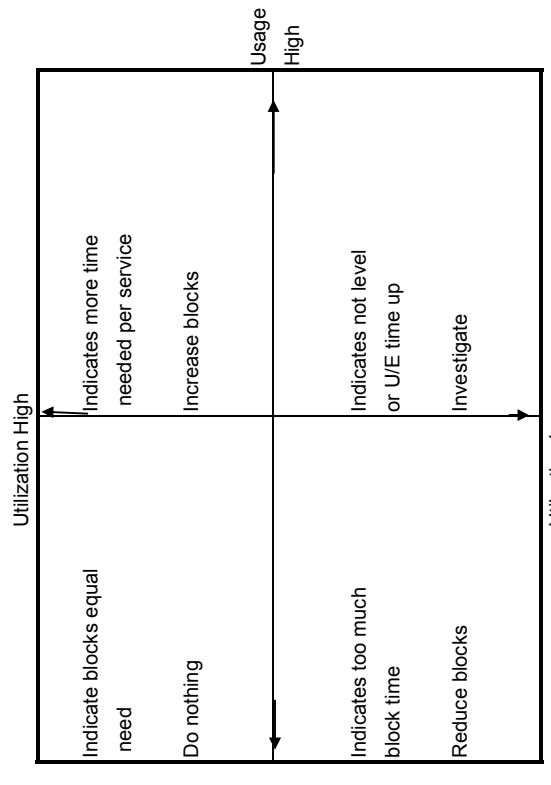
% Utilization = OR Hours within Blocks / Allocated Block Time

% Usage = All OR Hours Used / Allocated Block Time

Block Length: UH, Mott, EAASC & CVC

10 Hours = KEC, CGC & Livonia

8 Hours = Quarterly calculated service specific turnover will be added to the OR hours in the % Utilization.



**Implementation Plan:** Presented model to every service surgeon for approval & then began implementation.

## UH OR Modified Block Implementation Timeline

Phase	01FY08	02FY08	03FY08	04FY08	01FY09	02FY09
<b>Phase 1:</b>						
Develop Model Prototype	C					
Present to Every Department	C					
Obtain Approval for Modified Block Concept	C					
Update to Annual Data & Work with Depts to Develop their Modified Block Schedule	I	I	I			
Implement Monthly Schedules	I	I	I			
Revise Block Policy		C				
Develop Trend & Tracking Reports						
Determine & Implement ORMIS Revisions						
Implement Standard Scheduling Practices						
Develop Standard Vacation Policy						
Modify UH OR Staffing			F			
Determine Actual Savings			F			
Review Block Utilization & Adjust Section Allocations Accordingly			F	F	F	F
<b>Phase 2:</b>						
Develop Policy for OR FCFS & U/E						
<b>Phase 3:</b>						
Coordinate Policies across all Adult OR's						
<b>Phase 4:</b>						
Integrate Strategies with Hospital Occupancy						
<b>Phase 5:</b>						
Project Future Growth Impact						
<b>6-Complete, 1-In Progress, F-Future</b>						

**Title: Ambulatory Care Services Lean Transformation Plan**

**Owners: Jeanne Rizzo, David Spahlinger, MD**

**DRAFT**

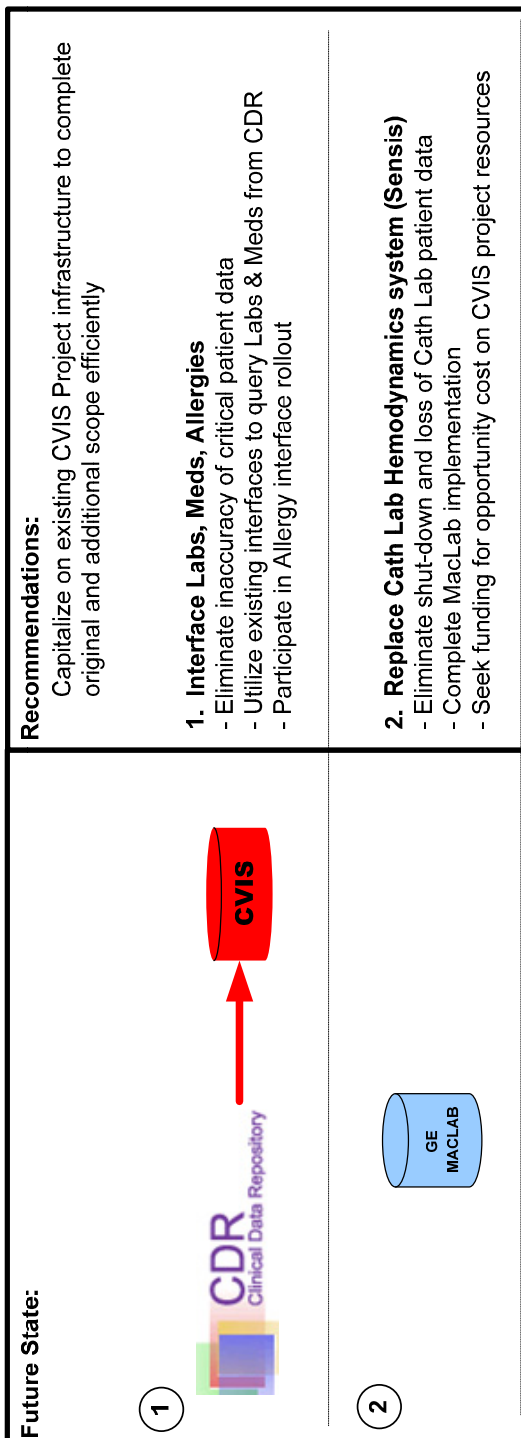
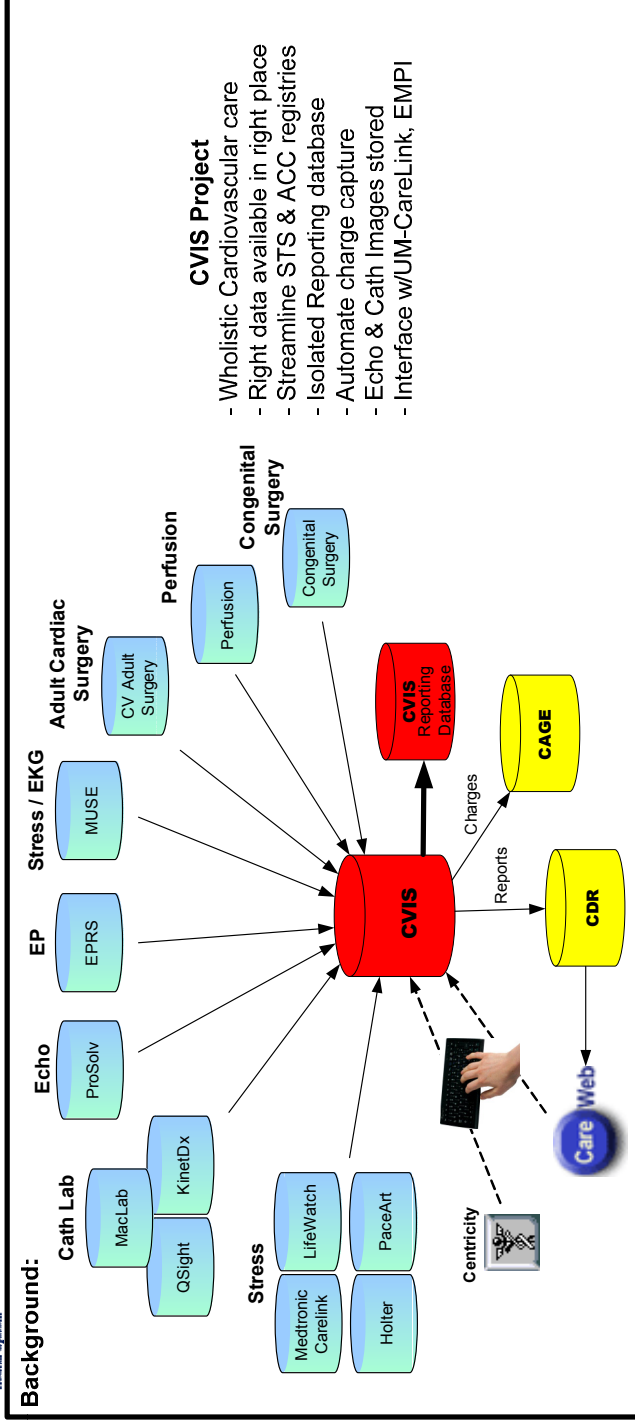


**Draft Date: December 19, 2007**

BACKGROUND	RECOMMENDATIONS																													
<ul style="list-style-type: none"> <li>● Mission Statement: We in Ambulatory Care are committed to creating and sustaining an environment that inspires and supports excellence in healthcare, medical education, and clinical research.</li> <li>● Ambulatory care recognizes the importance of implementing Lean by adopting the Michigan Quality System to:                             <ul style="list-style-type: none"> <li>- Build on the tradition of quality and operational improvement that exists in ACS.</li> <li>- Allow for the adoption of a consistent methodology to solve problems and make improvements.</li> <li>- Implement Lean by leveraging its experience in rolling out other products/services across its enterprise.</li> <li>- Implement a methodical process which will improve sustainability.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Provide training across ambulatory care network</li> <li>● Complete certification process for ACS embedded coaches</li> <li>● Develop processes to request ACS Lean coaches and to prioritize ACS projects</li> <li>● Information sharing and professional development need to be consistent across ACS embedded and central Lean coaches.</li> <li>● Influence and follow Medical School compensation committee principles regarding physician participation</li> </ul>																													
CURRENT SITUATION	PLAN																													
<ul style="list-style-type: none"> <li>● Ambulatory care is growing and is geographically dispersed.                             <ul style="list-style-type: none"> <li>- 40 sites</li> <li>- 104 Ambulatory Care Units (ACU)</li> <li>- 25 Sub-ACUs</li> <li>- 15 Ambulatory Care Coordinating Groups</li> <li>- 1.6 Million Visits per year</li> </ul> </li> <li>● Quality improvement and problem solving methods across ambulatory care have been inconsistent.</li> <li>● Variability in Lean experience and knowledge is evident.</li> <li>● Opportunities exist to eliminate waste in ambulatory care operations.</li> <li>● Opportunities for greater collaboration across ambulatory care is desired.</li> <li>● Opportunities for improvement in physician, employee and patient satisfaction exists.</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">                     Data to Be Added:                      Patient Satisfaction                      Employee Satisfaction                      Faculty Satisfaction                 </div>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">What</th> <th style="text-align: left;">Who</th> <th style="text-align: left;">When</th> </tr> </thead> <tbody> <tr> <td>1) Review A3 with MQS Chief Engineer</td> <td>J Rizzo</td> <td>12/13/2007</td> </tr> <tr> <td>2) Develop communication strategy                             <ul style="list-style-type: none"> <li>a) Cascade ACS Lean Transformation Plan to ACS leadership</li> <li>b) Incorporate Lean education requirement into individual performance plans</li> <li>c) Communicate processes to solicit ACS Lean Coach project support, and to prioritize and assign ACS Lean Coach support</li> </ul> </td> <td></td> <td></td> </tr> <tr> <td>3) Training                             <ul style="list-style-type: none"> <li>a) Schedule leadership to attend MQS 4 day or 5 day training                                     <ul style="list-style-type: none"> <li>- ACU Leadership Teams (Medical Director, Clinic Manager, Nurse Manager)</li> <li>- CDAs</li> <li>- Ambulatory Care Directors</li> <li>- ACS Project Managers</li> <li>- Others</li> </ul> </li> <li>b) Cascade Lean philosophy to ACS faculty and staff through "mini-teach" presentations (1-2 hours)</li> <li>c) Create a teaching plan for a "Lean Series" starting with the philosophy at                                     <ul style="list-style-type: none"> <li>- Health Center Leadership meetings</li> <li>- Ambulatory Care Coordinating Group meetings</li> </ul> </li> <li>d) Ambulatory Care Educational Services (ACES) to add lean content to Ambulatory Care Orientation</li> <li>e) Lean coaches to teach Lean tools in both formal and informal training sessions</li> </ul> </td> <td></td> <td></td> </tr> <tr> <td>4) Expand network of "Local Lean Leaders" in ACUs                             <ul style="list-style-type: none"> <li>a) Kathy Lash - Radiation/Oncology</li> <li>b) Annemarie Lucas - Psychiatry</li> <li>c) Tammy Ellies - Internal Medicine</li> <li>d) Others</li> </ul> </td> <td></td> <td></td> </tr> <tr> <td>5) Create database to track Lean activities                             <ul style="list-style-type: none"> <li>a) ACS projects</li> <li>b) Employee training/Lean experience</li> </ul> </td> <td></td> <td></td> </tr> <tr> <td>6) Work with MQS to complete embedded coach training</td> <td></td> <td></td> </tr> <tr> <td>7) Present ACS Lean Transformation Plan to other leadership committees including:                             <ul style="list-style-type: none"> <li>a) MQS Prioritization Committee</li> <li>b) Others</li> </ul> </td> <td></td> <td></td> </tr> <tr> <td>8) Track accomplishments toward goals</td> <td></td> <td></td> </tr> </tbody> </table>	What	Who	When	1) Review A3 with MQS Chief Engineer	J Rizzo	12/13/2007	2) Develop communication strategy <ul style="list-style-type: none"> <li>a) Cascade ACS Lean Transformation Plan to ACS leadership</li> <li>b) Incorporate Lean education requirement into individual performance plans</li> <li>c) Communicate processes to solicit ACS Lean Coach project support, and to prioritize and assign ACS Lean Coach support</li> </ul>			3) Training <ul style="list-style-type: none"> <li>a) Schedule leadership to attend MQS 4 day or 5 day training                                     <ul style="list-style-type: none"> <li>- ACU Leadership Teams (Medical Director, Clinic Manager, Nurse Manager)</li> <li>- CDAs</li> <li>- Ambulatory Care Directors</li> <li>- ACS Project Managers</li> <li>- Others</li> </ul> </li> <li>b) Cascade Lean philosophy to ACS faculty and staff through "mini-teach" presentations (1-2 hours)</li> <li>c) Create a teaching plan for a "Lean Series" starting with the philosophy at                                     <ul style="list-style-type: none"> <li>- Health Center Leadership meetings</li> <li>- Ambulatory Care Coordinating Group meetings</li> </ul> </li> <li>d) Ambulatory Care Educational Services (ACES) to add lean content to Ambulatory Care Orientation</li> <li>e) Lean coaches to teach Lean tools in both formal and informal training sessions</li> </ul>			4) Expand network of "Local Lean Leaders" in ACUs <ul style="list-style-type: none"> <li>a) Kathy Lash - Radiation/Oncology</li> <li>b) Annemarie Lucas - Psychiatry</li> <li>c) Tammy Ellies - Internal Medicine</li> <li>d) Others</li> </ul>			5) Create database to track Lean activities <ul style="list-style-type: none"> <li>a) ACS projects</li> <li>b) Employee training/Lean experience</li> </ul>			6) Work with MQS to complete embedded coach training			7) Present ACS Lean Transformation Plan to other leadership committees including: <ul style="list-style-type: none"> <li>a) MQS Prioritization Committee</li> <li>b) Others</li> </ul>			8) Track accomplishments toward goals				
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GOALS	<ul style="list-style-type: none"> <li>● Ensure ACS is delivering the Ideal Patient Care Experience through MQS implementaton.</li> <li>● Every ACS leader understands and fosters MQS elements.</li> <li>● Every worker understands his/her role in using MQS techniques for problem resolution.</li> <li>● ACS is recognized as a MQS exemplar across the Health System, locally, regionally and nationally.</li> </ul>																													
ANALYSIS	<ul style="list-style-type: none"> <li>● Inadequate resources to support Lean initiatives occur across ambulatory care.</li> <li>● Implementing Lean is challenging because it is based on "learning by doing".</li> <li>● Skepticism regarding Lean effectiveness exists.</li> <li>● Projects are developed, but not always shared across the enterprise.</li> <li>● Challenges to physician participation in workshops due to:                             <ul style="list-style-type: none"> <li>- Limited time</li> <li>- Compensation model does not reward participation</li> </ul> </li> <li>● ACS embedded coaches are not yet fully trained.</li> <li>● Variable Quality and problem solving methods in use</li> </ul>																													
Signatures	WORK IN PROGRESS																													
	<b>4</b>																													



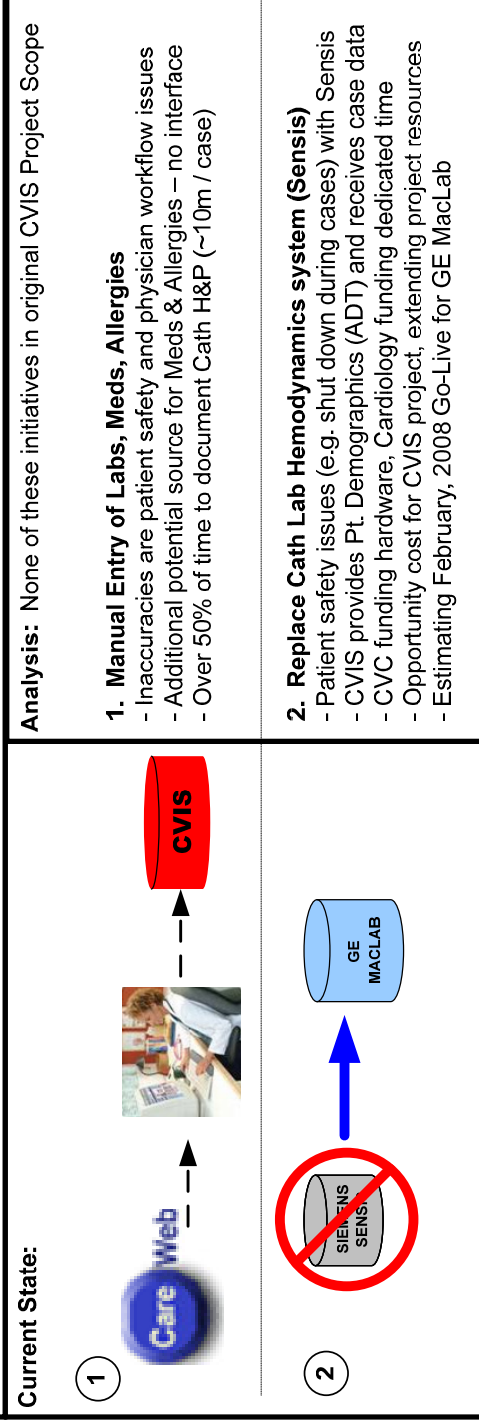
# CVIS Expansion FY09 A3 Proposal for ITSAC Consideration



**Recommendations:**

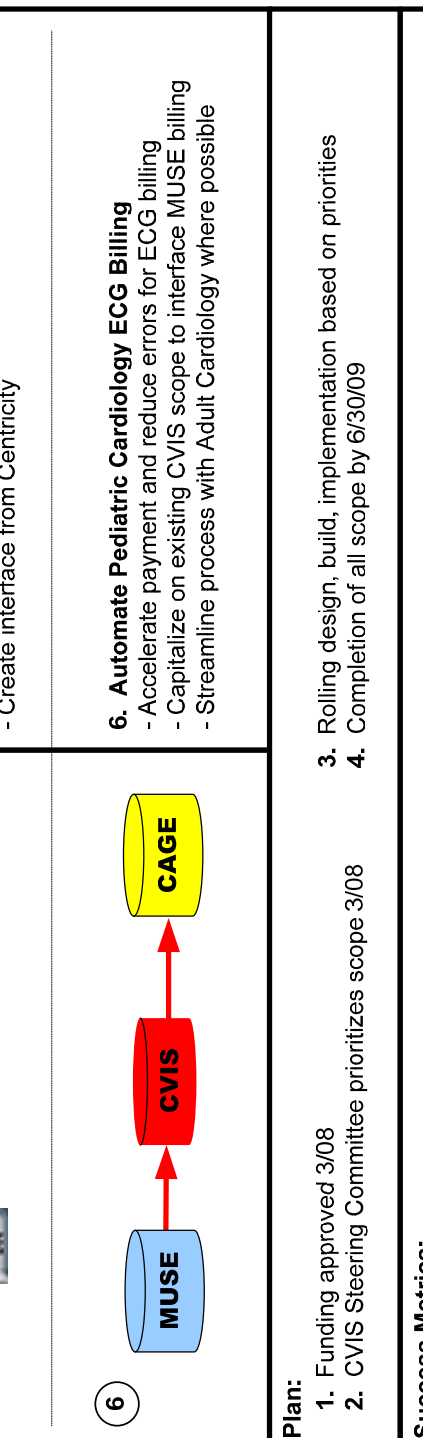
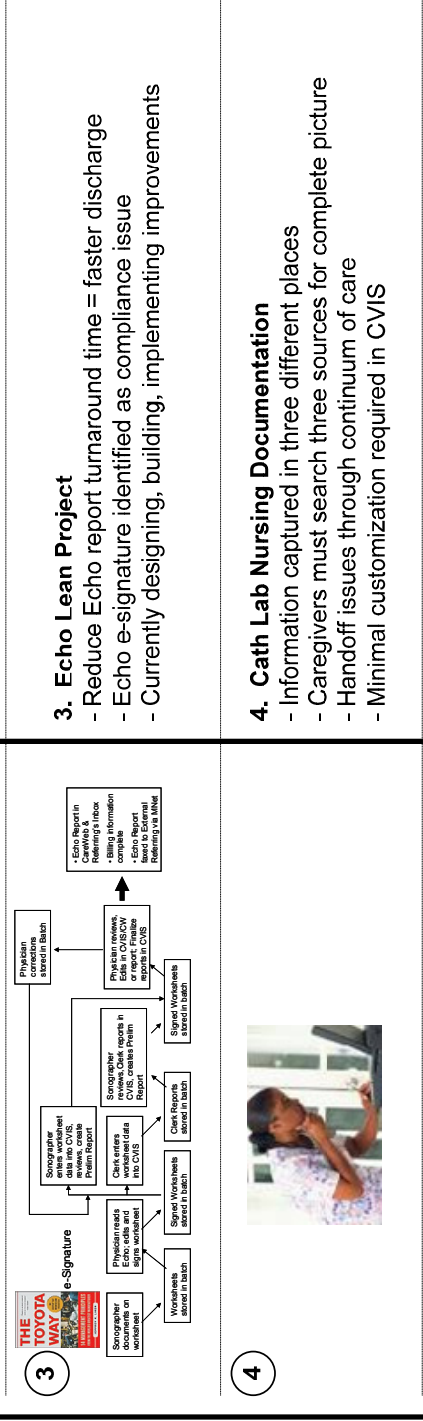
- Capitalize on existing CVIS Project infrastructure to complete original and additional scope efficiently

- 1. Interface Labs, Meds, Allergies**
  - Eliminate inaccuracy of critical patient data
  - Utilize existing interfaces to query Labs & Meds from CDR
  - Participate in Allergy interface rollout
- 2. Replace Cath Lab Hemodynamics system (Sensis)**
  - Eliminate shut-down and loss of Cath Lab patient data
  - Complete MacLab implementation
  - Seek funding for opportunity cost on CVIS project resources
- 3. Echo Lean Project**
  - Eliminate delays in patient discharge with same day reports
  - Revise report processes to expedite results in CareWeb
  - Build interface to enable CareWeb edit/sign feature for Echo
- 4. Cath Lab Nursing Documentation in CVIS**
  - Resolve hand-off issue by documenting in CVIS
  - Ensures complete picture of Cath Lab case in one system
  - Implement minor customizations to CVIS to capture data
- 5. Interface Operative & Perfusion case data**
  - Provide immediate access to OR data critical for CV patient care
  - Eliminate errors with critical patient data
  - Create interface from Centricity
- 6. Automate Pediatric Cardiology ECG Billing**
  - Accelerate payment and reduce errors for ECG billing
  - Capitalize on existing CVIS scope to interface MUSE billing
  - Streamline process with Adult Cardiology where possible



**Analysis:** None of these initiatives in original CVIS Project Scope

- 1. Manual Entry of Labs, Meds, Allergies**
  - Inaccuracies are patient safety and physician workflow issues
  - Additional potential source for Meds & Allergies – no interface
  - Over 50% of time to document Cath H&P (~10m / case)
- 2. Replace Cath Lab Hemodynamics system (Sensis)**
  - Patient safety issues (e.g. shut down during cases) with Sensis
  - CVIS provides Pt Demographics (ADT) and receives case data
  - CVC funding hardware, Cardiology funding dedicated time
  - Opportunity cost for CVIS project, extending project resources
  - Estimating February, 2008 Go-Live for GE MacLab
- 3. Echo Lean Project**
  - Reduce Echo report turnaround time = faster discharge
  - Echo e-signature identified as compliance issue
  - Currently designing, building, implementing improvements
- 4. Cath Lab Nursing Documentation**
  - Information captured in three different places
  - Caregivers must search three sources for complete picture
  - Handoff issues through continuum of care
  - Minimal customization required in CVIS
- 5. Manual Entry of Operative & Perfusion case data**
  - Incomplete picture of what happened during case
  - Time delay in case data, affecting continuum of care
  - Inaccuracies are patient safety and registry/natl ranking issue
- 6. Pediatric Cardiology ECG Billing**
  - Capturing ECG data in MUSE system, same as Adult Card
  - Multiple days to process ECG bills using manual process
  - Annual volume of 11,061



**Plan:**

1. Funding approved 3/08
2. CVIS Steering Committee prioritizes scope 3/08
3. Rolling design, build, implementation based on priorities
4. Completion of all scope by 6/30/09

**Success Metrics:**

- 1. Interface Labs, Meds, Allergies**
  - Eliminate patient safety issues with data inaccuracy
  - Eliminate critical data inaccuracy, physician rework
  - Decreased time to document Cath H&P
- 2. Replace Cath Lab Hemodynamics system (Sensis)**
  - MacLab system implemented, shut downs eliminated
  - Integrated with CVIS to expedite reports to CareWeb
- 3. Echo Lean Project**
  - Avg report turnaround from 3 days to same day for IP
  - 100% compliance of physician e-sig for Echo Reports
- 4. Cath Lab Nursing Documentation in CVIS**
  - One source for entire Cath Lab case information
  - Data in right place at right time to care for patient for CV disease
- 5. Data Entry of Operative & Perfusion case data**
  - Data immediately available at all points of CV care
  - Improved handoffs of care for CV patients
  - Eliminate critical data inaccuracy
  - Eliminate STS data inaccuracy – rankings, benchmark
- 6. Pediatric Cardiology ECG Billing**
  - Reduce number of days, hours, and errors associated with ECG bills



Background Information

On July 1, 2007, Visiting Nurses (MVN) & Michigan Visiting Care (MVC) ended its corporate status under the Michigan Health Corporation and moved to UM Hospitals and Health Centers as a department within Home Care Service operations. The departments that make up HCS are MVN, MVC, HomeMed, MedEQUIP and Wheelchair Seating Services.

This integration embodied the health system's strategic principles of "Integration, Collaboration, Teamwork and Innovation, Adaptation and Prioritization." It reinforced our commitment to quality and efficiency as it is an effort to better use the talents of the individuals providing home care services to Health System patients, and create a more integrated and collaborative environment to improve the quality and efficiency of the home care services we offer.

Recent challenges facing UMHS Home Care Services include shrinking payer reimbursement for services and increased costs associated with supplies, labor and equipment.

In the next few years these trends are expected to continue along with volume growth that exceeds available labor market. Labor shortages within health care professions such as Nursing, Pharmacy and Respiratory Care will present significant challenges to Home Care Service operations industry wide.

At UMHS it is critical that Home Care operations form lean strategies to address the industry impacting conditions described above in both infrastructure and physical layout to remain a viable and increasingly profitable, industry leading home care operation.

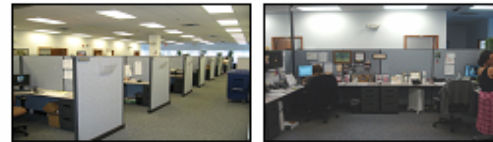
Lean Integration Into Home Care Services

In early 2007, Home Care Services leadership attended lean training and in July employed a QI project manager (Chris Calderone) specializing in Home Care lean implementation. The first lean teams were formed beginning in August 2007, & have completed/begun work in the areas described below

1.) MedEQUIP Intake Process – Referral Processing through Authorization and order generation

- 20 individual workstations converted to 4 "u" shaped work cells defined by payer type
- Avg. customer phone wait time reduced from 7 mins to less than 2 mins. (Avg: 270 calls per day)

**In total, 22.5 hours (per day) of customer wait time has been removed from the process**



2.) MedEQUIP Equipment Management & Warehouse/Supply Storage

- Implemented a Home Care Services 5-S Program
- Compliance with sched. preventative maintenance on equipment improved from 81% to 97%
- Productivity improved by 41% (160 packages per day vs. 95 – UPS, FedEx, USPS)



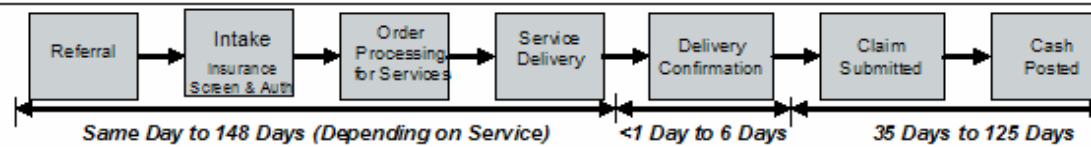
3.) Wheelchair Seating Services – Referral through Delivery Confirmation (Began 1/14)

- Current State Value Stream Map completed

HomeMed is also taking a lean approach to its Operations System Replacement Initiative and is participating with a interdisciplinary lean project team through the Cancer Center led by Lean Coach Whitney Walters. Lean education is also beginning with front line associates within MVN and MVC.

Through these early successes across each area of Home Care Services, front line employee commitment to and support for lean continuous improvement activities has grown. This incredible energy and desire for lean improvement across the business unit has led to the need for a Business Level Strategic Value Stream Analysis to assure resource commitment to improving the right areas, in the right sequence at the right time.

Current Situation Analysis



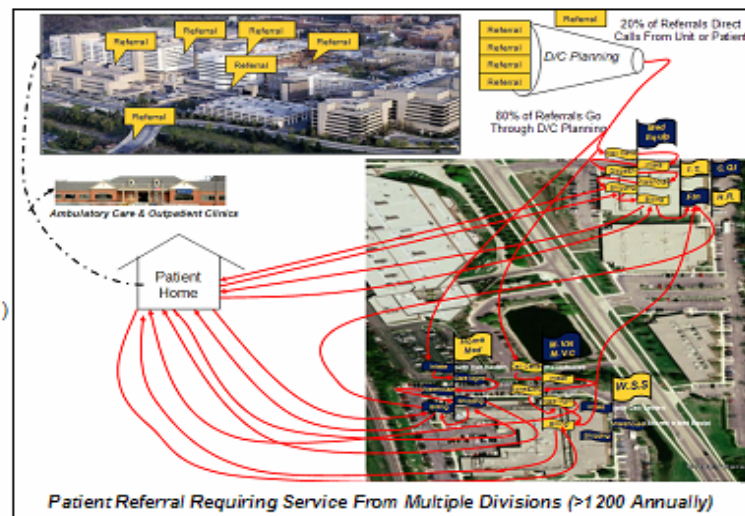
Key observations

- \* Referral timing in relation to pending d/c (variable)
- \* Little to no coordination across departments within HCS
- \* Existence of standardized processes vary within system
- \* Great deal of wasted motion within and across divisions
- \* Multiple input/information errors & rework points across HCS
- \* Duplicate depts/areas, each with (silo) functions across HCS (Leading to consolidation & optimization opportunities)
- \* Duplicate insurance verification tasks between D/C planning & intake at HCS

Results (Impact): (FY 07 Measures)

- \* Long total lead times (Ranging from 77 Days-HomeMed to 245 Days W.S.S.)
- \* Additional time & resources to maintain high Patient Satisfaction Scores (4.9 out of 5 & 100 out of 100) Exception: MedEquip - 4.3 out of 5)
- \* Low employee engagement scores: (?36 – Ranging from 58 to 63)
- \* High Turnover Rates Within MVN: (18.8% Annually)
- \* High % of "Same Day" Referrals: (Ranging from 20% – 26% Annually)
- \* **Lost opportunity to decrease Inpatient L.O.S.**

"Satellite" Spaghetti Diagram – UMHCS



Proposed Actions

1) Recommending a 3-day Business Level Strategic Value Stream Analysis Workshop led by an MQS Lean Coach and attended by the Home Care Services Senior Leadership team & Home Care lean project management staff (embedded coaches).

- Workshop Deliverables Include:
- 1) A Completed Future State Value Stream Vision for Home Care Services
  - 2) A Value Stream Roadmap consisting of Workshops, Do-Its & Required Data Analysis that are:
    - Strategically chosen
    - Prioritized against key metrics
    - Appropriately sequenced
  - 3) Within each lean improvement effort identified on the Roadmap it will contain:
    - Assigned Process Owner leads
    - The timeline for initiation/engagement (based on #2)

2) With the support of an MQS Lean Coach, complete & implement a plan for establishing and monitoring the key Value Stream Metrics

3) Seeking MQS oversight & support in integrating *customized* "GM – Discovery Room" concepts throughout the different phases of roadmap initiation

4) Following the event, we are requesting ongoing MQS support as a resource to the existing Home Care embedded coach and Senior leadership in delivering on the future state roadmap.

Workshop Sponsor: Marge Calarco  
Business Level Value Stream Owner: Ken Bandy

Assigned MQS Central Coach Resource: Brendon Weil  
Embedded Lean Coach: Chris Calderone

Key Value Stream Metrics

Metric Classification:	Baseline:	Target:
<b>Quality: (1 per Division)</b>		
HomeMed: Blood Stream Infection Rate (FY-07)	1 BSI / 1000 days	.46 (Benchmark)
MedEQUIP: Pneumonia Rate (Home Vent Patients – Q4 – 07)	.54 / 1000 days	.4 (Benchmark)
MVN: % of 12 Quality Measures Top 20 Nationally (2 are new)	40% (4/10)	100%
MVN: Hospital Re-admission Rate (Medicare/Medicaid Rolling 12)	24%	28% (Benchmark)
W.S.S: Equipment Repair Rate (# Repairs/365)	T.B.D.	T.B.D
<b>Safety:</b>		
Occupational Injuries (Dart Report - FY-07)	9.50 HCS, 2.96 MVN/MVC	3.00
Adverse Events (Total In RM-Pro / Total Events)	10 / T.B.D	% Reduction
<b>Service:</b>		
Patient Satisfaction: "Willingness to recommend" (4Q-07)	HM=4.9, ME=4.36, WSS=4.95	4.75
"Willingness to recommend" (4Q-07)	MVN=100%, MVC=75%	95%
Employee Engagement: "Willingness to recommend" (2007)	MVN=58.6 HCS=63	75
"Employee Turnover Rate" (2007)	MVN=18.8%, HCS=5.2%	T.B.D.
Internal Survey Results: D.C. Planning & Physician	T.B.D.	T.B.D
<b>Efficiency:</b>		
Same Day Referrals - % of total (Excluding WSS & MVC)	HM=20%, ME=26%, WSS=<1%, MVN= T.B.D	T.B.D
Net Margin - Actual / Budget (2Q-08)	\$2,469,542	\$1,576,890

Lead Time: "Order Receipt to Delivery" & "Order Receipt to Cash Posted" – FY07

Measure	HomeMed			MedEquip			M.V.N		W.S.S		
	Avg:	High:	Low:	Avg:	High:	Low:	High:	Low:	Avg:	High:	Low:
"Order to Required D.O.S - Days"	2	4	<1	3	14	<1	90	<1	148	211	109
"Order to Cash Posted – Days"	77	90	75	129	180	100	125	35	283	320	215

Next Steps

- 1) Approval to proceed & formal assignment of MQS Coach resources in the capacity described above 2/1/2008
- 2) Schedule a tour for HCS Senior Leadership of the discovery room at the GM Design Center in Warren Schedule by 3/1/2008
- 3) Complete measurement plan for Value Stream Metrics 3/1/2008
- 4) Plan and schedule the Business Level Strategic Value Stream Analysis Workshop 3/1/2008
- 5) Complete the workshop and begin initiation of the Value Stream Road Map As Schedules Allow

# Failure to Obtain Appropriate Consent as a Cause of OR Delays

## Automating the Informed Consent Process to Improve OR Efficiency

Presenter: Eric Schneider, M4 Date: 2/8/08

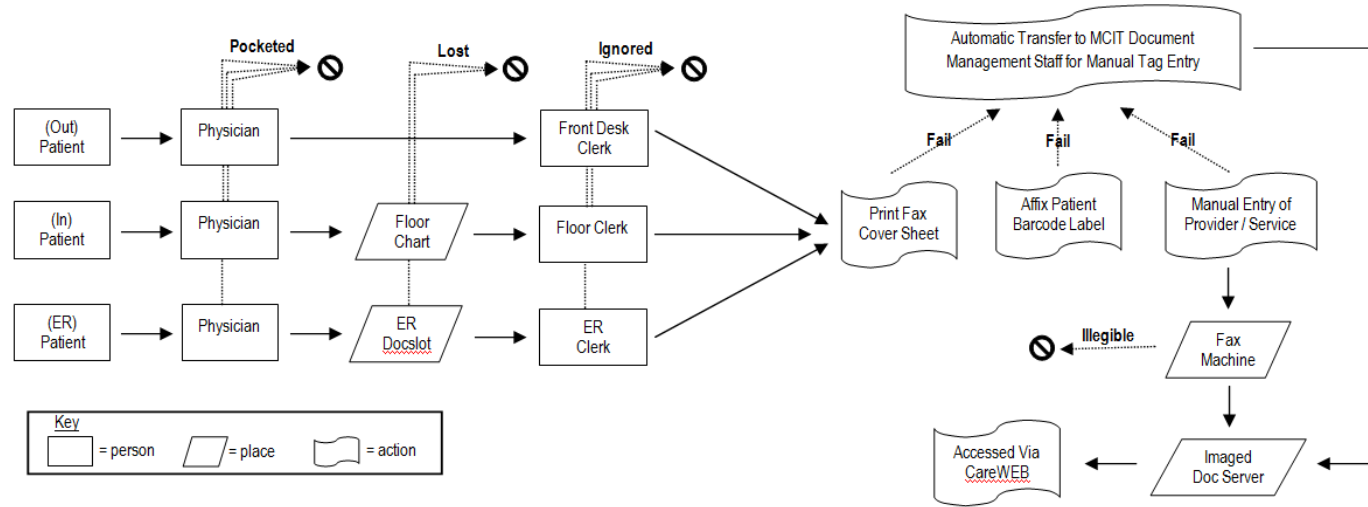


### Background

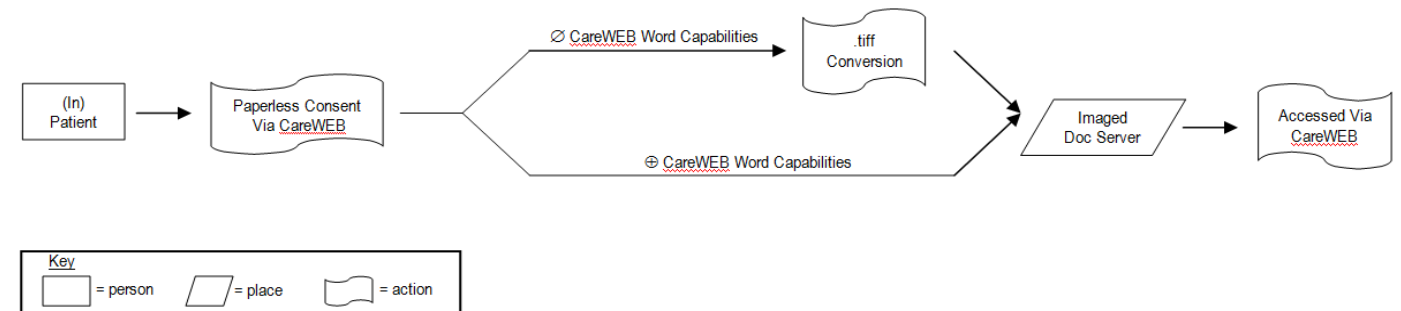
Operating room delays place a sizable financial burden on the health care system in addition to exacting significant personal costs to providers and their patients. The financial cost of such delays is related to unutilized OR time estimated at ~\$20/minute. These delays also exact personal costs in the form of unwarranted patient stress, extended staff hours, diminished job satisfaction.

While undoubtedly a multifactorial issue, failed documentation remains a major contributor to the problem. Anecdotally, lost or incomplete informed consent is cited repeatedly as a significant contributor to delays. This outcome is at least partially related to the informed consent process straddling the paper/digital divide, and thus amenable strictly digital solution.

### Current State



### Future State



### Recommendations

In an effort to eliminate potential mishandling related to the transportation, digitization, and storage of paper consent documents, a completely digital solution should be pursued in the form of an automated informed consent process. Automation will be achieved via implementation of the following:

- Application of paperless of signatures via digital stylus/pad system
- Digitization of all existing departmental, procedure-specific consent forms for use with paperless system
- Institution of electronic consent documentation software (e.g. iMedConsent)
- Integration of resulting Word document into CareWEB via conversion to .tiff format or direct Word interface

In addition to reducing delays related to lost consents, the introduction of electronic consent software will provide a platform for the addition of interactive modules intended to improve communication, patient education, and patient comprehension.

#### Options:

##### Full Electronic Consent

- Fully digitized documentation
- Eliminates handling, processing, and technology shortfalls
- Improved data entry via info entry prompts
- Automatic EMR documentation
- Enables platform for improved patient education & comprehension
- Large software/hardware cost

##### Paperless Signature Only

- Fully digitized documentation
- Eliminates handling, processing, and technology shortfalls
- Moderate software/hardware cost
- Moderate provider training investment
- Process improvement continues to be owned by health system

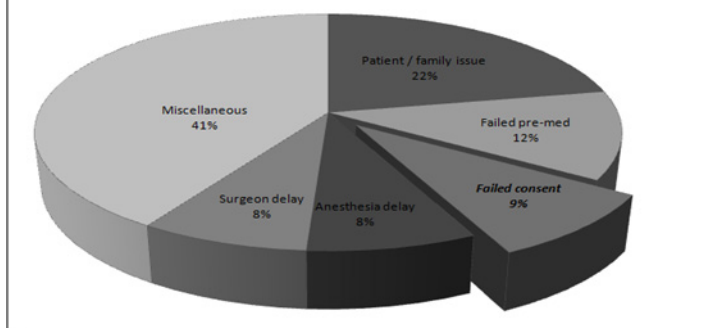
##### E-Signature Only

- Fully digitized documentation
- Eliminates handling, processing, and technology shortfalls
- Small software/hardware cost
- Shifts burden of process improvement to patient
- Large potential delays related to patient non-compliance
- Increased benefit for "frequent flyers"

### Analysis

Root cause analysis of OR delays has been underway in the Mott Hospital ORs over the course of the past 17 months. Process improvement staff have observed the timing of first cases and documented the cause of delayed starts—defined as patient on OR table >5 minutes past scheduled start—into several predefined categories. According to these results, failed (i.e. lost, incomplete, or inappropriately updated) consent is responsible for ~9% of delayed starts leading to an average delay of 19 minutes, making it the #3 cause of delays.

Origins of First Case OR Delay - Mott Hospital, 8/21/06-1/25/08



To place the cost of these failed consents into monetary terms:

$$\left( \frac{\text{avg procedures}}{\text{yr hospital}} \right) \times \left( \frac{\text{procedures w/ consent}}{\text{total procedures}} \right) \times \left( \frac{\text{minute}}{\text{reconsent}} \right) \times \left( \frac{\text{OR cost}}{\text{minute}} \right) = \frac{\text{cost}}{\text{hospital}}$$

### Plan

An advisory committee composed of members from FGP, OCA, Risk Management, Legal Affairs, and MCIT will be required to implement the automation process. This team will be charged with accomplishing the following tasks:

- Comparing workflow changes and patient burden associated with paperless signature vs. e-signature
- Seeking out sites currently employing chosen technology to assess for improvement in consent process fidelity
- Identifying the desired standardized, procedure-specific consents to be included in electronic consent database
- Evaluating potential electronic consent software and digital stylus/pad hardware options
- Piloting technology on limited basis and assessing workflow alterations in outpatient setting
- Identifying appropriate personnel to own consent failures related to patient comprehension, information retention, and provider-patient communication

Title: Fostering SMT use of PDCA cycles for strategic plan deployment: goals/objectives

Owners: Billi, Strong, Kin

Date: 11/5/2007 3p

**Background:**

\*UMHS: developed our strategic plan for 2007-8, with explicit goals and objectives

\*Each goal/objective needs a specific plan for achieving it

\*SMT needs to: -Track progress on plans, barriers, counter-measures to overcome them

-Foster ongoing *Plan-Do-Check-Act* (PDCA) cycles re goals

\*A3: -a structured problem-solving method

-standard work for communication

-fosters dialogue and consensus

**Current Status:**

\*Each UMHS clinical mission goal and objective has an SMT lead(s):

**MAJOR AREAS OF FOCUS**

<b>1</b>	<b>Improve access and maximize capacity in all our patient areas</b>	
<b>a</b>	Inpatient beds/transitions in care process	Denton/Valdes/Warner/Calarco
<b>b</b>	ED/unscheduled admissions process	Denton/Valdes/Calarco
<b>c</b>	ORs/ scheduled admissions process and smoothing	Denton/Warner/Spahlinger/Rizzo
<b>d</b>	Imaging capacity improvement	Denton/Valdes/Rizzo
<b>2</b>	<b>Enhance clinical quality and safety performance</b>	
<b>a</b>	CareLink	DeWitt
<b>b</b>	Surgical site infections	Bahl
<b>c</b>	ICU-acquired infections	Bahl
<b>d</b>	Medication reconciliation at discharge	Bahl
<b>e</b>	Pressure ulcer prevention and treatment	Bahl
<b>f</b>	Pediatric asthma	
<b>3</b>	<b>Enhance key workforce planning strategies</b>	
<b>a</b>	Recruitment	Childs
<b>b</b>	Retention	Childs
<b>c</b>	Supervisor training	Childs
<b>4</b>	<b>Increase parking and transportation options for employees</b>	
<b>a</b>	New parking structure on wall street	Peterson
<b>b</b>	Improve bus services	Peterson
<b>c</b>	Investigate support for a proposed rail system	Peterson
<b>d</b>	Promote teleconferencing capabilities between off site locations and Health System Campus	Peterson
<b>5</b>	<b>Improve ambulatory care experience in partnership with the Faculty Group Practice</b>	
<b>a</b>	FGP/Ambulatory Care Integration project	Spahlinger/Rizzo
<b>6</b>	<b>Improve the customer experience</b>	
<b>a</b>	Customer service excellence program	Guglielmo/Childs
<b>b</b>	Environmental cleanliness	Peterson
<b>c</b>	Ideal Patient Experience	Rizzo/Billi
<b>d</b>	Discharged patients will have medication in hand when leaving	Denton/Calarco
<b>e</b>	Schedule follow-up appointments prior to discharge	Rizzo/Calarco
<b>f</b>	Develop system across UMHS to schedule inpatient diagnostic and treatment services	Valdes/DeWitt

**Goals:**

1. Develop and implement an efficient system to manage deployment of UMHS strategic plan, especially SMT managing the Goals and Objectives.
2. Foster SMT's knowledge and use of lean thinking, especially structured problem solving, PDCA cycles, use of A3 to build consensus on problems, causes, and plans
3. Foster SMT's ability to mentor others in structured problem solving, PDCA, A3 use.

**Analysis:**

1. Barriers to achieving our strategic goals and objectives:
  - lack of resources
  - lack of time: overburden with other tasks, firefighting (*muri*)
  - lack of agreement on the plan – need cooperation to fix anything
  - lack of a plan
  - variable ways of presenting your problem solving methods (*mura*)
2. Uniform use of the A3 fosters:
  - a common, structured problem-solving method
  - standard work for communication of results, barriers
  - dialogue and building consensus
  - identifying lack of agreement & hidden misunderstandings
3. Barriers/pitfalls to using a standard system (like the A3) to track progress:
  - lack knowledge or experience
  - a flood of A3s without the mentoring, conversations, problem solving: “A3 as goal”
  - skepticism/cynicism
    - the “in thing”; flavor of the month
    - the waste of over-processing (A3 is more than what the problem requires)
    - oppose “standardization” as cookbook, inhibiting creativity...
  - formatting logistics (fitting 11x17, color, paper size, copying, headings...)
4. How is an A3 different from a Dashboard?
  - A3 shows your thinking
  - A3 shows connections between plans, goals, root causes, and countermeasures
  - fosters debate about specific plans or steps

**Recommendations:**

1. SMT members use A3s to track plans, problems, progress for their Goals/Objectives
2. SMT members hone their skills at structured problem solving through
  - a. practice creating, presenting and giving feedback on A3s at SMT meetings
  - b. “pulling” added training as needed from MQS staff
  - c. potential for an A3 “master class”
3. SMT members use A3s with peers and others in their projects, to mentor and model good problem solving (go and see, ask “why” 5 times, respect people), chief engineer

**Plans:**

1. Presentation/discussion at SMT, seek consensus on common model J Billi 11/6/2007
2. If consensus, SMT members create A3s on their own Objectives SMT 11/27/2007
3. SMT members present/discuss their A3s at SMT, retreats, HHCEB... SMT 12/2007
4. Offer SMT custom training, master classes in A3 thinking MQS 11/13/2007

**Follow-up:**

1. SMT meetings

# Improving Patient Flow by Reducing Hospital Readmissions through Patient Involvement

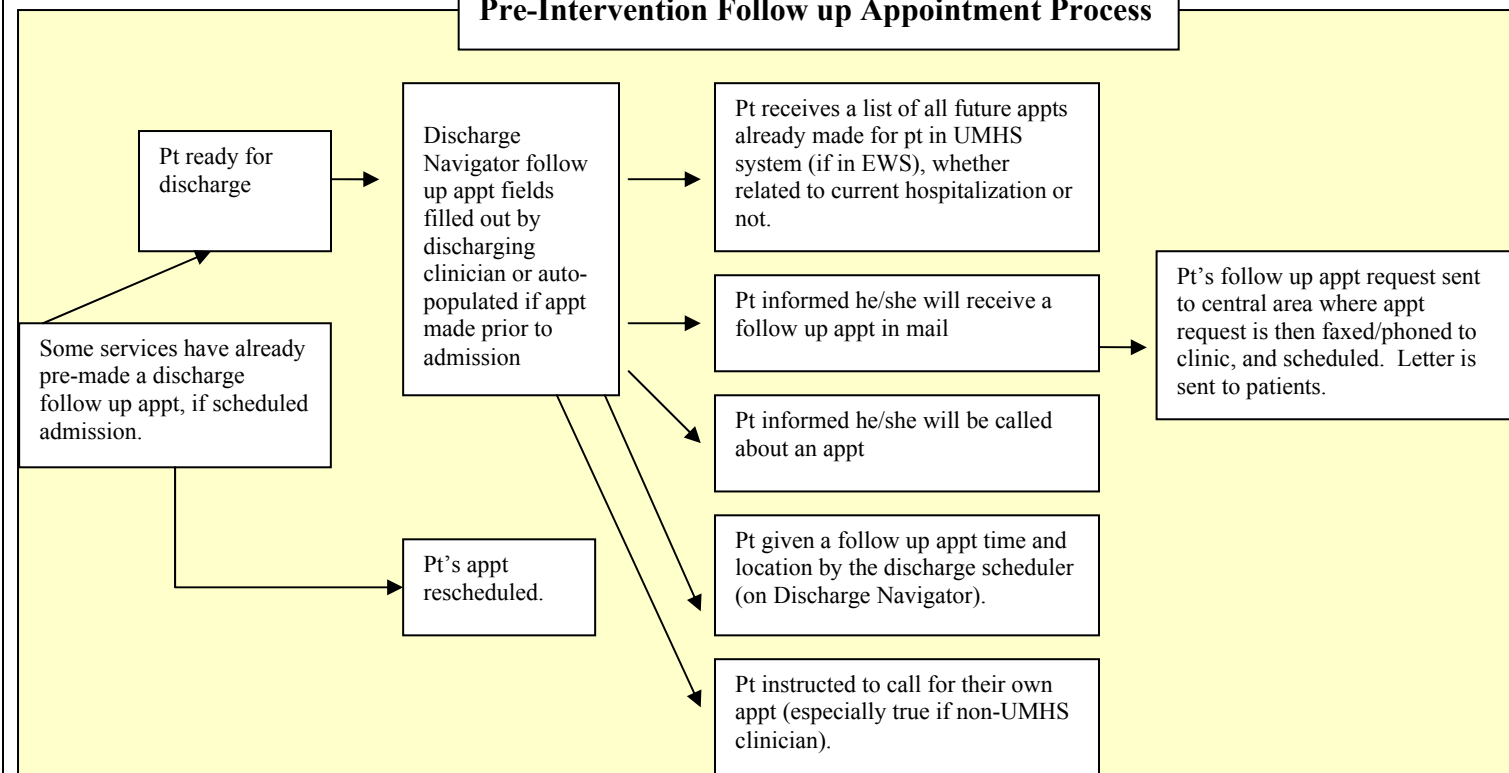
**Name of Project or Theme:** LEAN Discharge Follow up Appointment Process

**Where Are We in the Project Cycle?** Full rollout to MFH Service - October 2007

## Brief History

Each year, the University of Michigan Health System (UMHS) treats more than one million outpatients, provides at least 36,000 hospital visits, conducts hundreds of scientific research projects and educates the next generation of medical professionals. UMHS has experienced high occupancy for the past 12 months with an average occupancy of 93%. In an effort to improve patient flow and increase capacity a lean project was commissioned to study the inpatient discharge process on a pilot unit. The time after discharge is considered high risk for patient care, often marked in our patients by re-admissions and/or repeat ER visits. The follow-up appointment from discharge is hypothesized to be the cornerstone of continuity of care to prevent re-admits/ER visits. In 2006, prior to an intervention, 48,954 discharge follow-up appointments were scheduled primarily after the patient was discharged. Approximately 60% of patients arrived to their appointment, 15% were no-shows and 25% cancelled. A 1<sup>st</sup> intervention on the Medical Faculty Hospitalist Service (MFH) was piloted, scheduling appointments prior to discharge. Due to process issues, this change did not significantly affect the rate of no-shows and cancellations. A separate ER pilot had been implemented to improve follow-up appointments from ER discharges. For the 2<sup>nd</sup> intervention, this process was adapted to include the patient in scheduling discharge appointments and online appointment request tool was developed and piloted.

## Pre-Intervention Follow up Appointment Process



**Future State Goals:** Ensure that patients have a communicated follow up appointment(s) at the time of the discharge from the hospital, to promote a smooth transition of care to the outpatient setting. A specific goal for the discharging physician is to focus on determining which follow up appointments are important as related to this hospitalization. An anticipated outcome was that emergency room visits and/or readmissions would decrease.

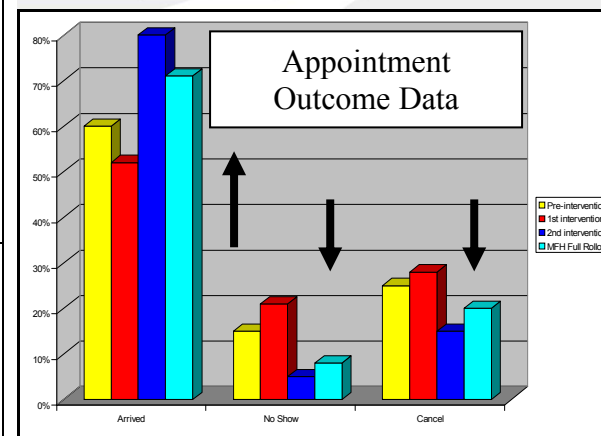
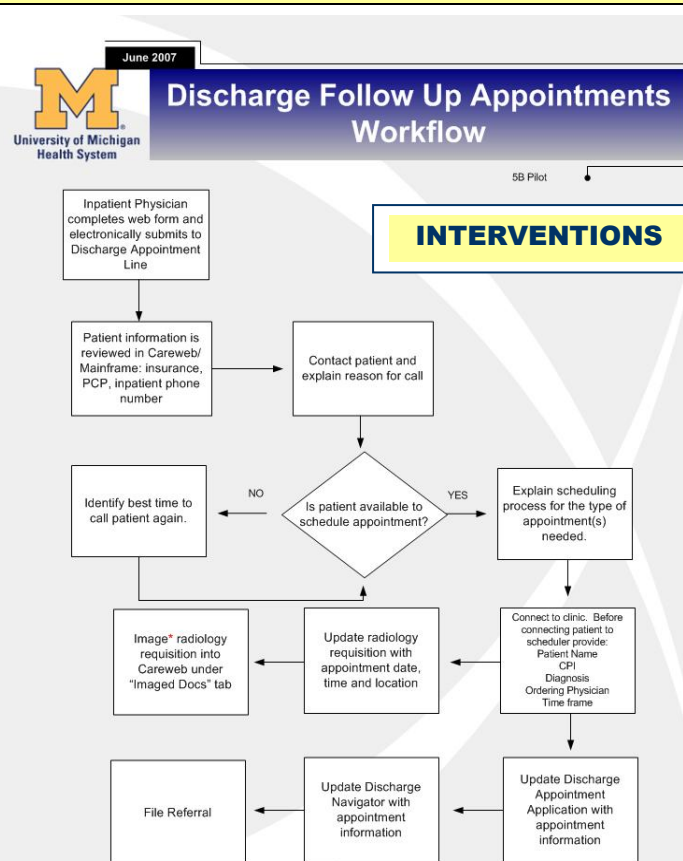
- Appointment made prior to patient leaving, at least 24 hrs prior to discharge
- Appointment made with patient/family involvement
- U of M Attending Physician is notified that appointment is made
- Nursing includes follow up appointment information during discharge instructions

## Who Is Involved? (Major stakeholders and players)

**Lean Process Owners:** Robert Chang, MD and Donna McClish, RN **Lean Coaches:** Kate Bombach and Christopher Kim, MD, **Public Relations and Marketing Communications:** Josie Aguirre and Laura Rowland **Outpatient clinics staff, Patients and Families**

## Countermeasure Implemented to Date:

- A web site was developed to allow physicians to place requests for discharge follow-up appointments for patients on the 5B inpatient unit. (See attachment 1)
- The workflow process for discharge follow-up appointments was standardized. (See attachment 2)
  - U-M physician completes Web form to request a discharge follow-up appointment with either the patient's PCP or a specialist.
  - A discharge appointment coordinator receives the request in a work queue. The coordinator contacts the patient directly, while still in the hospital, and reviews the discharge instructions for a recommended follow-up appointment. (See attachment 3)
  - The discharge appointment coordinator connects the patient to either the PCP's office or specialty clinic by telephone to schedule a follow-up appointment within the suggested time frame.
- The process allowed the nurse to review the online discharge appointments in Discharge Navigator.
  - As part of the discharge process, the unit nurse reviews any necessary patient education information and future scheduled appointments.
- An easy online process for tracking the appointment outcome was developed for the U-M physician
  - The discharge appointment coordinator documents the appointment outcome in the Discharge Follow-Up Appointment Web application, for the U-M physician to track.



## Appointment Outcome

**Pre-intervention**  
(12/1/2004-11/30/2005)  
Scheduled Apts. 398  
Arrived 237 (60%)  
No Show 61 (15%)  
Cancelled 100 (25%)

**MFH Full Rollout**  
(9/6/2007 - 11/9/2007)  
Scheduled Apts. 249  
Arrived 178 (72%)  
No Show 20 (8%)  
Cancelled 51 (20%)

## Readmission Rate < 14 days

Pre-intervention 11.81%  
MFH Full Rollout 7.90%

## Return to ED < 3 days

Pre-intervention 3.96%  
MFH Full Rollout 0.75%

## Lessons Learned:

- Multidisciplinary team consisting of physicians, nurses, discharge planning, information technology, public relations designed an application that was very user friendly.
- The Michigan Quality System and the lean Healthcare Method was an effective methodology. Small scale testing led to rapid improvements in the Web forms.
- Understanding physician workflow and tools can improve work flow.
- Take advantage of pre-existing technology and expand on it. The inclusion of individuals from Information Technology is essential.
- Frequent, focused and succinct communication was key. This included soliciting feedback from the faculty and staff.
- Involvement of patients and families was essential.
- Standardized training for the physicians is essential. In order to be effective, the training needs to be focused and hands on.
- Multiple rounds of testing helped to flush out problems and user interface design.

## Next Steps:

- Patient satisfaction data collection
- Firming up takt time: number of calls the scheduler can handle per day and how long each call takes
- Discussion of expansion after stress test is over and above steps completed
- Hospital-wide - will look at other services (i.e. surgery often schedules their f/u appointment in clinic prior to admission)

# A3 - FY08 Operating Budget

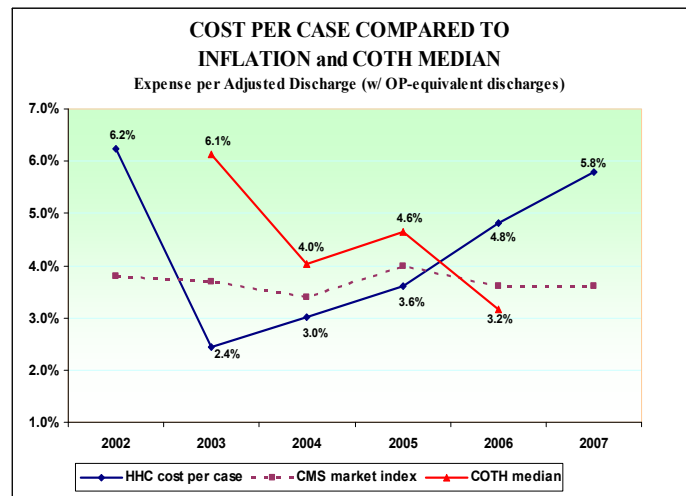
Owners: Morlock and Denton; 3/23/07 EDF

## Problem Statement

Develop a 3% operating margin budget in the face of large off-the-top expense increases related to new capacity, IT and accounting rules.

## Current Situation

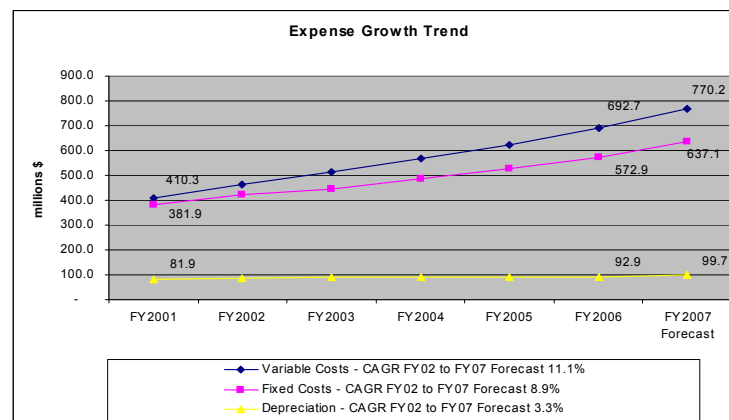
- We're on budget YTD FY07, but final 4 months of year budgeted to be most profitable, even though we plan to incur large CVC activation expenditures
- Aggressive FY08 activity projection of 7.6% increase, which is much higher than history
- Cost per case growing faster than inflation and peers
- FY08 projections show that we can increase expenses 11% over FY07, which is a 3.2% increase in cost per case. However, there are many off-the-top expenses, leaving \$45M for volume and commodity inflation funding.



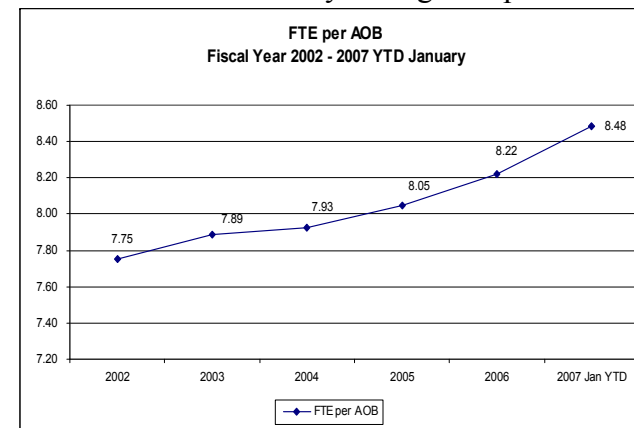
Available 11% expense increase over FY07	\$166
<b>Less: Off the top expense increases</b>	
GASB 45	(\$27)
Depreciation increases	(\$23)
Salary program & benefits	(\$27)
Interest, bad debt, rent, & utilities	(\$16)
CareLink operating	(\$8)
Clinical faculty, GME, HOs, phys extenders	(\$12)
SMT Priorities	(\$3)
Contingency & "pools"	(\$12)
Total off the top expense increases	(\$128)
Subtotal available increase less off the top	\$38
add back: one-time CVC expenses for FY07	\$7
<b>\$ available for volume and commodity inflation</b>	<b>\$45</b>

## Analysis

Fixed costs have not stayed fixed.



FTEs relative to activity have gone up.



- CAGR: people cost = 6.8%; physician cost = 4.9%; supply/pharmaceutical cost = 2.6%
- Projected increase for CVC alone was \$56M, which is higher than the \$45M available volume funding.
- None of these projections include expense shifts related to the new Ambulatory Care/FGP model.
- None of these projections include major changes in government reimbursement programs.

# FY08 Operating Budget

## Recommendation

The proposed plan includes the following features:

- Budget for a 3% salary program, which is already included in the off-the-top numbers
- Contingency pool intended to cover typical contingency, extraordinary mid-year inflationary issues, non-volume related operating expenses related to capital projects, informatics program, labor market funding, and Clinical Innovation Fund.
- Specific money set aside for SMT Areas of Focus.
- Process to spread \$45M for volume and inflation toward clinical areas critical to driving revenue.
- Some funding for "quasi-variable areas."
- No commodity inflation funding for indirect areas.
- Slightly more pressure on areas that do not benchmark well.
- Fixing systematically under-budgeted areas from FY07 (operations support services, nursing, and OR).

	FY07 PROJECTED	FY08 PROPOSED	INCREASE	% CHG
CARDIOLOGY	\$32,656,443	\$37,656,443	\$5,000,000	15%
OR/PACU	\$96,171,604	\$105,671,604	\$9,500,000	10%
RESPIRATORY CARE	\$16,521,969	\$17,921,969	\$1,400,000	8%
RADIOLOGY	\$52,261,500	\$56,161,500	\$3,900,000	7%
NURSING SERVICES	\$207,694,192	\$218,078,902	\$10,384,710	5%
EAST ANN ARBOR SURG CNTR	\$10,355,789	\$10,873,578	\$517,789	5%
ACS INTERNAL MEDICINE	\$2,846,309	\$2,988,624	\$142,315	5%
ACS CANCER CENTER	\$28,688,447	\$30,122,869	\$1,434,422	5%
ANESTHESIA	\$20,741,854	\$21,778,947	\$1,037,093	5%
PATHOLOGY	\$68,983,503	\$70,583,503	\$1,600,000	2%
ACS all other	\$66,743,963	\$68,078,842	\$1,334,879	2%
HEMOCARE SERVICES	\$31,532,616	\$32,163,268	\$630,652	2%
EMERGENCY DEPARTMENT	\$20,603,109	\$21,015,171	\$412,062	2%
PHARMACY	\$108,073,511	\$109,873,511	\$1,800,000	2%
ALL OTHER CLINICAL AREAS	\$122,071,836	\$126,954,709	\$4,882,873	4%
<b>SUBTOTAL CLINICAL AREAS</b>	<b>\$885,946,645</b>	<b>\$929,923,442</b>	<b>\$43,976,797</b>	<b>5%</b>
QUASI VARIABLE AREAS	\$73,798,349	\$75,274,316	\$1,475,967	2%
INDIRECT AREAS	\$320,679,198	\$320,679,198	\$0	0%
<b>SUBTOTAL VOL + COMMOD INFL</b>	<b>\$1,280,424,192</b>	<b>\$1,325,876,956</b>	<b>\$45,452,764</b>	<b>4%</b>

Overall cost per case increase = 3.2%  
 Cost per case increase not including accounting rule and depreciation changes = 2.3%

## Follow up

- Continued analysis of numbers, March – April, 2007
- Various group meetings and presentation, March – April, 2007
- HHCEB approval April 30, 2007
- Variance group-level charge and expense budgets, March – April, 2007
- Detailed budget worksheets distributed in late April
- Regental approval May 17, 2007
- Monthly monitoring throughout FY08 with actual to budget reports and cost per unit of service reports
- ASAP begin work on revamped operating budget approach for FY09 (MQS project?)

# A3 Strategic Financial Plan

Owner: Morlock

Date: 12/13/07

**Problem: Support strategy with capital spending that fits in reasonable earnings estimates and prudent cash & debt**

## Capital plan (changes from last COG highlighted)

	FY 08 - 10	FY 11 - 13	FY 14 - 17	Total
Routine capital	\$341	\$382	\$606	\$1,329
Beds 8D, 4D, 7A	\$10	\$0	\$0	\$10
C&W	\$385	\$108	\$0	\$493
Mott backfill	\$0	\$20	\$0	\$20
Eye & Diabetes	\$45	\$0	\$0	\$45
Imaging expansion	\$38	\$0	\$0	\$38
Lab building	\$3	\$97	\$0	\$100
Lab backfill	\$0	\$0	\$20	\$20
CareLink	\$12	\$0	\$0	\$12
EPCE	\$14	\$0	\$0	\$14
Data Center	\$51	\$0	\$0	\$51
Data Ctr backfill	\$2	\$8	\$0	\$10
CIF	\$16	\$18	\$28	\$62
Addtl investment	\$20	\$140	\$536	\$696
<b>Total</b>	<b>\$937</b>	<b>\$773</b>	<b>\$1,190</b>	<b>\$2,900</b>
Last year's SFP total				\$2,676

## Capital spending options (changes highlighted)

Brighton	\$80
Chelsea	\$50
C&W Clinics and equipment	\$80
EPCE / ACIS	\$211
C&W shelled beds	\$85
Bed Tower: convert to private rooms	\$225
Bed Tower: + 100 beds	\$150
East Mechanical Bldg Replace	\$20
Taubman	\$50
Musculoskeletal EAA	\$98
Briarwood replacement	\$40
other Amb Care Expansion	\$49
ED Expansion	\$20
ED Peds to C&W Backfill	\$10
Faculty Office Building	\$75
OR Reconfiguration	\$35
Wall Street Enhancement	\$64
Wall Street Campus People Mover	\$10
UH Kitchen Remodel	\$15
<b>Total</b>	<b>\$1,367</b>

## Assumptions Common To All Scenarios (changes highlighted)

Operating Margin Target	3%	
Investment Return	8%	
Borrowing	\$400M	↓ \$100M for UM capacity
Philanthropy	\$175M	
Med School Investment	\$750M	↑ \$23 for sharing agreements
Ending beds	1,100	

## Desired: IP & OP expand, ACIS, all in 5 years

Project	FY 08 -10	FY 11 - 13	FY 14 - 17	Total
ACIS	\$50	\$75	\$0	\$125
Bed Tower Convert	\$75	\$150	\$0	\$225
Bed Tower + 100	\$100	\$50	\$0	\$150
Brighton	\$120	\$0	\$0	\$120
Chelsea	\$50	\$0	\$0	\$50
C&W Clinics	\$30	\$50	\$0	\$80
C&W shell beds	\$10	\$75	\$0	\$85
Faculty Office Bldg	\$0	\$75	\$0	\$75
<b>Total</b>	<b>\$435</b>	<b>\$475</b>	<b>\$0</b>	<b>\$910</b>

IP growth CAGR	2%
OP growth CAGR	9%
Occupancy high point	89%
Days cash low point	120
Downside cash range	40 - 60 days
Approx avg budget challenge	\$85M

This is very risky for both margins and cash, due to accelerated timing and high amount.

Total spend higher than SFP calls for  
Daunting budget challenge  
High risk for cash levels  
Occupancy high point is FY09; out-years around 80%

## 1 IP investment before OP, reduced IT

Project	FY 08 -10	FY 11 - 13	FY 14 - 17	Total
EPCE / ACIS	\$0	\$0	\$30	\$30
Bed Tower Convert	\$0	\$0	\$225	\$225
Bed Tower +100	\$0	\$80	\$70	\$150
C&W shell beds	\$0	\$85	\$0	\$85
C&W Clinics	\$30	\$50	\$0	\$80
Brighton	\$0	\$0	\$80	\$80
Chelsea	\$0	\$50	\$0	\$50
<b>Total</b>	<b>\$30</b>	<b>\$265</b>	<b>\$405</b>	<b>\$700</b>

IP growth CAGR	2%
OP growth CAGR	7%
Occupancy high point	89%
Days cash low point	225
Downside cash range	145 - 165 days
Approx avg budget challenge	\$60M

Occupancy high for 3 years, then in low 80s  
Delays Amb care projects, slowing OP growth.  
Financially sound.

## 3 Blended portfolio, but less financially sound

Project	FY 08 -10	FY 11 - 13	FY 14 - 17	Total
EPCE / ACIS	\$0	\$0	\$35	\$35
Bed Tower Convert	\$25	\$200	\$0	\$225
Bed Tower +100	\$15	\$135	\$0	\$150
C&W shell beds	\$15	\$70	\$0	\$85
C&W Clinics	\$10	\$70	\$0	\$80
Brighton	\$57	\$63	\$0	\$120
Chelsea	\$0	\$30	\$30	\$60
Faculty Offices	\$0	\$0	\$75	\$75
<b>Total</b>	<b>\$122</b>	<b>\$568</b>	<b>\$140</b>	<b>\$830</b>

IP growth CAGR	2%
OP growth CAGR	9%
Occupancy high point	89%
Days cash low point	200
Downside cash range	120 - 140 days
Approx avg budget challenge	\$67M

Total spend is higher than base plan allows for.  
Occupancy high for 3 years, then around 80% thereafter.  
Occupancy could be mitigated by using old Mott temporarily.  
Pushes days cash 20% below medians; strains bond rating.  
Pretty large budget challenge.

## 2 OP investment before IP, reduced IT

Project	FY 08 -10	FY 11 - 13	FY 14 - 17	Total
EPCE / ACIS	\$0	\$0	\$25	\$25
Brighton	\$0	\$80	\$0	\$80
Chelsea	\$0	\$50	\$0	\$50
Taubman	\$0	\$0	\$50	\$50
Musculoskeletal	\$0	\$0	\$98	\$98
Briarwood Center	\$0	\$0	\$40	\$40
Amb Care - Other	\$0	\$0	\$42	\$42
C&W Clinics	\$30	\$50	\$0	\$80
C&W shell beds	\$0	\$0	\$85	\$85
Bed tower +100	\$0	\$0	\$150	\$150
<b>Total</b>	<b>\$30</b>	<b>\$180</b>	<b>\$490</b>	<b>\$700</b>

IP growth CAGR	1%
OP growth CAGR	10%
Occupancy high point	88%
Days cash low point	230
Downside cash range	150 - 170 days
Approx avg budget challenge	\$60M

Occupancy 84%-88% throughout decade  
IP and OP growth rates probably too divergent, causing great strain on beds  
Financially sound, if we can pull it off.

## Conclusions and discussion points

- 1 Doing everything we want as soon as we want it creates a very risky picture.
- 2 We need to decide on investments for next 3-5 years. Plans for out years will change based on circumstances.
- 3 An investment portfolio with the full EPCE/ACIS limits patient growth, strains capacity and creates a large operating budget challenge.
- 4 Two of the biggest risks in the plan are routine capital being way too low in the out years, and capital cost estimates being too low.
- 5 All of the scenarios laid out exclude a number of projects.
- 6 We need to do a UMHS SFP.