Basic Knowledge of Clinical Microsystems

Success Characteristics of Great Clinical Microsystems
Developing Microsystems

Marjorie M. Godfrey, PhD(c) RN
Doctoral Student, Jönköping University
Co-Director, The Dartmouth Institute
Microsystem Academy

Steve Harrison
Service Improvement Manager, Sheffield Teaching Hospitals

13:15-14:30
10th International Clinical Microsystem Festival
Jönköping, Sweden
February 27, 2013

Topics

1. Health care systems & Microsystems (13.15)
2. Success characteristics of microsystems (13.25)
3. Developing Microsystems to sustain high performance: An example! (13.50)
4. Resources to improve your Microsystems (14.20)

Margie
1. Health Care Systems & Microsystems

- Every day, every where around the world, patients and families enter or activate health care systems.
- The results?

Variations in practice and spending
The Dartmouth Atlas: Medicare per-capita spending

The Quality of Medical Care in the United States:
A Report on the Medicare

The Dartmouth Atlas of Health Care

Medicare Spending per capita 2006
- $30,230 to $35,230 (43)
- $25,000 to $30,230 (37)
- $20,000 to $25,000 (35)
- $15,000 to $20,000 (30)
- $10,000 to $15,000 (20)
- $5,000 to $10,000 (15)
- $0 to $5,000 (10)
- Not Populated

Margie
Percent of Diabetic Medicare Enrollees Receiving Annual HbA1c Testing

The Wennberg INTERNATIONAL COLLABORATIVE
Report of the Second Annual Conference

Hospitalization rate for CVD
Geographic variation (2003-2007)

Session #2
“Every system is perfectly designed to get the results it gets.”

Paul B. Batalden, MD

Founding Director, Healthcare Improvement Leadership Development
The Dartmouth Institute for Health Policy and Clinical Practice
Co-Founder Institute for Healthcare Improvement

We all have health care experience stories

What if we deeply immersed ourselves in the clinical microsystems of care?
Complexity of Care Delivery

Within, Between and Across Clinical Microsystems
(Fragmented and Lack of Continuity a risk)

The “True” Structure Of The Delivery System?

• As experienced by the patient ….
  – People working together (or against each other)
  – In front line clinical teams (or tangles)
  – Often embedded in larger organizations (or Byzantine bureaucracies)
  – That are more or less loosely connected (or totally disjointed)
  – And provide more or less perfect (or deadly dreadful) care
Systems of practice, intervention, measurement, policy

Self-care system

Individual care-giver system

Microsystem

Mesosystem

Macrosystem

Market / Geopolitical system

Health Care System: The “Must Do’s”

1. Better patient outcomes … including costs & value of care
2. Better system performance … including professional development
3. Better professional development … including new learners and lifelong learning
Science-based Improvement

• certainty of cause & effect, shared importance
• loose-tight coupling
• simple-complicated-context

“Generalizable Scientific evidence” + “Particular Context” → “Measured Performance Improvement”

I
• control for context
• generalize across contexts
• sample design

II
• understand system “particularities”
• learn structures, processes, patterns

III
• balanced outcome measures

IV
• strategy
• operations
• people

V

The Clinical Microsystem!

Microsystem Assumptions

• Many have heard of the idea and have various notions of what it means
• We all have more experience living in, working in, and using them; than we have studying, changing, and leading them
• They exist now…
How can we see the “clinical microsystem?”

- A small population of patients
- Small group of doctors, nurses, other clinicians
- Interdependent for a common aim, purpose
- Some administrative support
- Some information and information technology
Building Block of Health Care

- The place where each patient is in direct contact with interdisciplinary health care professionals, is the fundamental building block that remains the foundation of all health care systems is the Clinical Microsystem.

Clinical Microsystem

- Clinical reflects the essential priorities of health and care giving
- Micro reflects the smallest replicable unit of health care delivery
- System reflects that this frontline unit has an aim and is composed of people, processes, technologies, and patterns of information that interact and dynamically transform one another
- The clinical microsystem is the place where patients, families, and caregivers meet
- It is the locus of value creation in health care
Microsystems Are The Building Blocks That Come Together To Form Macro-organizations

The health system can be no better than the small systems ...

30,000 Foot View: A Large Health System

System Levels
- Macrosystem
- Mesosystem
- Microsystem

Example
- Dept of Nursing
- Inpatient Divisions
- Frontline Patient Care Units
• Some of you have a card on your chair
• Read out in turn
• Hands up - Is this a Microsystem?

Steve

Basic Concepts

• The **Microsystem** is the place where patients and families & health care teams meet
• The **Mesosystem** is the “collection” of other systems that facilitate processes in the index microsystem.
• The ** Macrosystem** is the global system in which care is provided.
A Picture of a Clinical Microsystem

The Anatomy

Building a Team to Manage A Panel of Primary Care Patients

Mission: The Dartmouth-Hitchcock Clinic exists to serve the health care needs of our patients.

Very High Risk

Chronic

Healthy

Chronic

P A C E

P A C P P E

A C P P E

Processes

Purpose

Patients

Professionals

Patterns

Micro-System Approach 6/17/08 Revised: 12/17/08

Measurement Team Performance & Patient Outcomes and Costs:

Measure | Current | Target | Measure | Current | Target
--- | --- | --- | --- | --- | ---
Pieres 6-8y |  |  | Patient Satisfaction |  |  |  |
Direct P Care Access |  |  | Patient Satisfaction |  |  |  |
Total PMPM |  |  |  |  |  |  |

Eugene C. Nelson, DSc, MPH
Paul B. Batalden, MD
Dartmouth-Hitchcock Clinic, June 1998

TEAM MEMBERS:

Nashua Internal Medicine

Sherman, MD
Leslie, MD
Joe, MD
Diane, RN
Maggie, RN
Lynn, MA

Amy, Secretary
Buffy, Secretary
Mary Ellen, Secretary
Dawn, LPN
Linda, LPN

Measure Total PMPM vs.

Referrals
Pharmacy
Radiology
Laboratory
Medical Records
Scheduling
Department
Division and Community
Southern Region
Hitchcock Clinic System

Measuring Team Performance & Patient Outcomes and Costs

Measure | Current | Target | Measure | Current | Target
--- | --- | --- | --- | --- | ---
Pieres 6-8y |  |  | Patient Satisfaction |  |  |  |
Direct P Care Access |  |  | Patient Satisfaction |  |  |  |
Total PMPM |  |  |  |  |  |  |

25

13

Session #2

Continual Imp. of Health Care 3/5/2013
Microsystem

The Physiology

A “Generic” Clinical Microsystem Model

- Satisfaction of need, monitoring, assessment of outputs

- Beneficiary knowledge, including knowledge of life while not in direct contact with the health care system

- Acute care
- Chronic care
- Preventive care
- Palliative care

- Functional
- Biological
- Expectations
- Costs

- Functional
- Biological
- Satisfaction
- Costs
Supporting Microsystems

People with Healthcare Needs

Prevention
Acute
Chronic
Palliative

People with Healthcare Needs Met

Supporting Microsystems

Have Many Roles:
Within their own microsystem
and as members of other microsystems
At The End of the Day…

- Patient care is only as good as the care that is *delivered by frontline staff*.
- The “front line staff” are in places where patients, families and care teams meet which we call *Clinical Microsystems*.
Microsystem ≠ Team

1. Providers + beneficiaries
2. People + Information Technology
3. People, Work in a setting
4. Purpose
2. Success Characteristics of High Performing Microsystems

- Quinn & world’s best service organizations
- Dartmouth study of North America’s best microsystems

J Brian Quinn

- World’s best of the best service organizations culminated in publication of the seminal work, *Intelligent Enterprise*.
- Quinn discovered the world’s most successful service organizations placed a major focus on what he called the *smallest replicable units (SRUs)* or *minimum replicable units (MRUs) within their enterprise*.
- *These were* the places where true value transfer took place, where suppliers interacted directly with the customers, and where service was delivered.
At Same Time, Brian Quinn Was Asking:

“Why are some service organizations enjoying explosive growth and margins?”

He found that the “big” focus on the “smallest replicable units” AKA “microsystems”
- Front office fixated on front line perfection
- Quality, efficiency, timeliness, service excellence designed into front line
- Value and loyalty created at customer-provider interface

High Performing Clinical Microsystems

Leadership
- Leadership
- Organizational support

Staff
- Staff focus
- Education & Training
- Interdependence of care team

Performance
- Performance results
- Process improvement

Patients
- Patient Focus
- Community & Market Focus

A Special Blend
3. Developing Microsystems

“Microsystems are the vital component in any execution strategy”

Uma Kotagal, MD
Cincinnati Children’s Hospital Medical Center

Front Line Development

- To develop people
  - Head
  - Hand
  - Heart

- To improve care & respond to new pressures for quality

- To grow your microsystem from the inside out
Clinical Microsystems Create the Conditions for Reflection

- Organized, disciplined method for the reflection
- Patient and family focus
- Systems thinking
  - Move from only thinking about assignments and shifts
  - Subpopulation focus and study
  - Process evaluation
- Learning to work in interdisciplinary teams

Reflective Practitioner

- Move from task orientation only
- Reflect on processes and outcomes
  - Notice patterns
  - System perspective
  - Population perspective
- Learn to work with other professionals with a focus on the patient and family
Interdisciplinary Teams

• Find ways to do better at meeting each patient’s needs
• Make the work experience for every staff person meaningful & joyous
• Increase each staff person’s ability to improve his/her own work & contribute to betterment of system

A JOURNEY UP THE IMPROVEMENT RAMP

Cystic Fibrosis Outpatients
Northern General Hospital
Sheffield Teaching Hospitals NHS Foundation Trust

Steve
Context

• Cystic Fibrosis in Sheffield has 150 patients in their system
• Based at the Northern General Hospital
• Outpatients – 2 main clinics staffed by doctors, nurses, dieticians, physio, respiratory physiologists and other healthcare professionals

Cystic Fibrosis Outpatients

• Microsystems Improvement approach first tested in Falls clinic early 2011 (Project Evie)
• Consultant from CF contacted SI team, suggested by Service Manager
• Pressing Issue – Capacity & Demand
Pre Phase – The Work Before the Work

- March 2011
- Met clinical leaders – ‘challenging’ team dynamics
- Lots of time invested in discussing the approach with the Doctors, manager and senior nurses
- Sought support from Clinical Director
- Agreed expectations, set a regular weekly meeting, communication plan, who would be involved, Patient representation
- Coach – visited unit

Initial Meeting - April 2011

- Introduced what quality improvement is
- Introduced effective meeting skills and roles
- Set up the ground rules

There’s so much talk about the system. And so little understanding

Robert Pirsig
Zen and the Art of Motorcycle Maintenance
The Dartmouth Microsystem Improvement Ramp

5P Assessment

Effective Meeting Skills

Cause & Effect
Change Ideas
Specific Aim
Global Aim
Theme

Global Aim
1
2
3
SDS
A
P
DS
A
P
DS
A
P
DS
A
P

Patients - Hello to Brandon

Let’s introduce Brandon...

- He is 25 & from Lincolnshire
- Living with his girlfriend & dog
- Electrical sales assistant
- Relies on family for transport
- Lung function FEV1 62%
- BMI 19 has drink supplements
- Colourised with pseudomonas
- He has pancreatic insufficiently, osteopenia, Diabetes, fertility issues
- He has a portacath
- Physio—exercises occasionally, home neds when poorly
- He has regular antibiotics, 3 home nebulised IVs per year
- He has never been an inpatient

What does Brandon want (and need) from the CF service?

- He doesn't want to have CF
- He wants to feel in control of his life
- He wants a service to fit around his life, job, social and family
- He wants a time efficient service, no wasting or duplication or unnecessary appointments
- He wants printed or online letters, he doesn't want to come for multiple separate appointments
- He wants minimal repetition at the appointments he attends
- He wants phone, email, internet access for immediate advice
- He wants to feel informed of his adherence to treatment, even if it is poor
- He wants confidentiality and consistency with the team
- He wants to be well at a minimum effort
- He wants pharmacy to be quick so he can get back home at the end of an appointment
- He wants to feel empowered, in equal partnership with the team
- He wants local access or an outreach team for home visits
- He wants appointments to be flexible & available on weekends or evenings
- He wants familiarity, support and trust from the team
- He wants a nice environment when he visits clinic with some entertainment
- He wants reassurance of segregation and rigorous infection control
- He would like to be with other CF patients when he needs advice & support when ill
**5Ps Data Collection April May 2011**

- Took place over several weeks – pieced together
- Staff & patient survey
- High level process map
- Patients timed clinic
- National Benchmarking reviewed
- Data from hospital systems
- Capacity and demand forecasting

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The 5Ps develop.....
Purpose

• What is the purpose of the microsystem?
• Lots of debate!

‘To enable people with CF to live as normal a life as possible’

5Ps review – May 2011

• Meeting dedicated to reviewing the 5Ps
• Team stuck post its – where they saw something to improve for Brandon
• Grouped these to form ‘Themes’
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CF improvement Themes

Capacity & Demand

Adherence

Clinic Process & Flow
The Dartmouth Microsystem Improvement Ramp

CF Clinic Global Aim

- We aim to improve the efficiency and quality of the service of the CF outpatient clinic for staff and patients. The process begins with first contact with the patient and ends with them arriving back to their home after the visit. By working on the process we expect; the DNA rate to improve, for there to be less waiting for patients, improved efficiency for patients and staff and to achieve a greater standard of our quality markers. It is important to work on this to improve the clinic experience for patients, meet CF trust standards, and to provide an area of clinical excellence.
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CF Clinic Global Aim
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Flowchart
A detailed process map

• Took three sessions
• Everybody understood the process by the end!
• Generated lots of change ideas – Car Park
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Effective Meeting Skills

Specific Aim – June 2011

- After reviewing the 5Ps and the Flowchart the team chose to reduce Patient waiting as their first Specific Aim

“We aim to reduce average total patient waiting time within the 2 CF outpatient clinics by 50% from our baseline measure of 40 minutes by the end of October 2011’
The Dartmouth Microsystem Improvement Ramp

**Global Aim**

- We aim to improve the efficiency and quality of the service of the CF outpatient clinic for staff and patients. The process begins with the first contact with the patient and ends with them arriving back to their home after the visit. By working on the process we expect:
  - The DNA rate to improve,
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  - Improved efficiency for patients and staff,
  - And to achieve a greater standard of our quality markers.

It is important to work on this to improve the clinic experience for patients, meet CF trust standards, and to provide an area of clinical excellence.

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**Communication**

- Fax machine doesn’t work properly
- Dictation delays clinic, always get out of sync
- Lots of paperwork delays the clinic

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**Late & Early arrivals**

- Culture – it’s accepted
- See early patients early (sometimes)
- See patients even if late
- Patients don’t have own transport
- Hospital transport is late
- Reliant on others for lifts

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**Scheduling**

- Mismatch of arrivals and resources
- Don’t know how long things take – cycle times
- Non standardised – variation in content
- Waiting for other professionals to finish

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**CF Clinic**

Why are Patients waiting in the CF clinic?

- Trials
- PEG changes, not planned into timings
- Going to find nebuliser from the ward
- X ray
- Going to the Pharmacy if patient too unwell
- Pharmacy
- Taking patient off for a ward tour
- Answering the doorbell
- Telephone Calls
- Calls from the ward

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**Themes**

- Effective Meeting Skills

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**Change Ideas**

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**Specific Aim**

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**Measures**

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**Cause & Effect**

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Continual Imp. of Health Care

Why are Patients waiting in the CF clinic?

- Late & early arrivals
- Communication
- Treatments
- CF Clinic
- Finding Things
- Scheduling
- Interruptions
- Mismatch of arrivals and resources
- Don’t know how long things take – cycle times
- Non standardised – variation in content
- Waiting for other professionals to finish
- Culture – it’s accepted
- See early patients early (sometimes)
- See patients even if late
- Patients don’t have own transport
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- Calls from the ward
- Lots of paperwork - delays the clinic

The Dartmouth Microsystem Improvement Ramp

- Cause & Effect
- Measures
- Change Ideas
- Specific Aim
- Global Aim
- Themes

Effective Meeting Skills
Change Ideas

- Review of Fishbone and Process map
- Brainstormed ideas to reduce waiting – top 4

Interactive Group Exercise

- Watch video (5 mins)
- Groups of 4/5 (7 mins) to discuss
  - Your reactions to the video, your thoughts and feelings?
  - What relevance does this video have for microsystem quality improvement?
- Report back one or two key reflections to the whole group (1-2 mins each group)
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Global Aim

Change Ideas

Specific Aim

Measures

Themes

Effective Meeting Skills

Value Compass

We aim to reduce average total patient waiting time within the 2 CF outpatient clinics by 50% from our baseline measure of 40 minutes by the end of October 2011

Time Spent Waiting in Clinic per patient

Attendance to CF Clinic

DNA rate

Stakeholder perspective

Number of staff in CF clinic

Quality/Cost = Value
The Dartmouth Microsystem Improvement Ramp

**Global Aim**

**Change Ideas**

**Specific Aim**

**Measures**

**Cause & Effect**

Effective Meeting Skills

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**PDSA**

- Used PDSA worksheet to Plan changes
- Used timing data to reschedule clinic and devise an new Gantt
- New whiteboard introduced
- Standard Clinic Proforma devised
- Clinic rooms standardised – numbered, scales, BMI calculators
- Measures – Ongoing measurement
PDSA - Plan

<table>
<thead>
<tr>
<th>Task to be completed</th>
<th>Who</th>
<th>When</th>
<th>Tools/Training needed</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrange for installation of clinic whiteboard</td>
<td>Clinic W</td>
<td>Start Aug 2011</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Clearly number all Clinic rooms</td>
<td>Clinic W</td>
<td>Need week</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Set up excel sheet to capture patient timing data</td>
<td>Sally D</td>
<td>Need week</td>
<td>Email</td>
<td>None</td>
</tr>
<tr>
<td>Ensure all patients complete a cycle time form</td>
<td>Yvonne</td>
<td>Need next</td>
<td>Word - Cycle</td>
<td>None</td>
</tr>
<tr>
<td>Create new ideal clinic template based on cycle times</td>
<td>Yvonne with MS team</td>
<td>A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PDSA – Do & Study

[Graph showing changes over time with data points and trend lines]
The Dartmouth Microsystem Improvement Ramp

Service Improvement

Specific Aim

Global Aim

Effective Meeting Skills

Improvement – multiple ‘ramps’

5Ps

Themes

Capacity & Demand

Global Aim

Specific Aim 1 Increase nurse led activity

Specific Aim 2 Reduce Variation in follow up frequency

Clinic Process & Flow

Global Aim

Specific Aim 1 Reduce Waiting

Specific Aim 2 Reduce DNA

Specific Aim Shorten Annual Review

Adherence

Global Aim

Specific Aim 1 Increase use of iNeb

Specific Aim 2 Increase use of MI
Timeline – Pre & Action Phase

- Pre Phase: March 2011
- First Meeting: April 2011
- 5Ps Data: April – May 2011
- Themes & Aims: June 2011
- Ideas & Measures: July 2011
- First PDSA: Sept 2011

Timeline – Action & Transition

- Second PDSA - Clinic: Nov 2011
- Adherence MI: Jan - Feb 2012
- Capacity & Demand: March - April 2012
- Clinic PDSA - Nurse Express: June - August 2012
- I.neb roll out: Sept 2012
- Moved to new location - Redesign: Dec 2012
Finally – Some staff reflections

We now have better, smoother, unhurried clinics, shorter waiting times, happier patients, happier staff - more efficient

The team ethos has changed with the patient more firmly at the central point. The OP processes have been streamlined and are much better. Patient adherence has been accepted by all the team as important and a workstream is developing this. Previously some people gave this lip service.

Has been really inspiring. For the first time I have felt that I’ve been able to implement changes to help the service run more efficiently for patients and staff

I have enjoyed this experience immensely and have a passion for making things better for the patients. It has been satisfying for me personally to be able to do this with a system that I thought we were stuck with and that we all hated - staff and patients.

Lots has improved - clinic running much better, focusing on improving patients outcomes

We now have a re-energised team no longer daunted by increasing work load but motivated to find ways to work more effectively - and seeing them work
4. Resources for Improving Microsystems

• What resources can you use to improve and innovate?

Start with
www.clinicalmicrosystem.org

www.clinicalmicrosystem.org
Click Materials
Click Toolkits
“Getting Started”
http://www.clinicalmicrosystem.org/toolkits/getting_started/

Clinical Microsystem Improvement Workbooks
The Microsystem Academy

- Resides in The Dartmouth Institute for Health Policy and Clinical Practice (TDI)
- Actively researching, coaching, and leading clinical microsystem development since the early 1980s.
- Through the integration of professional experience, empirical and cutting-edge research methodologies and information, “Coach the Coach” offers an exciting, and rigorous curriculum of experiential learning in the art and science of interdisciplinary microsystems coaching. (Web based & Face-to-Face)
On Line Non-Degree Programs

http://www.tdiprofessionaleducation.org/

Coaching Health Care Improvement

”...Building relationships among people who are continuously learning about the changing environments in which they live and work, intervening in and moving to set aside ineffective and counter-productive habits, and building new skills, practices, habits, and platforms for collaborating in this ever changing world.”
### Team Coaching Model

<table>
<thead>
<tr>
<th>Pre-Phase</th>
<th>Action Phase</th>
<th>Transition Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting Ready</td>
<td>Art &amp; Science of Coaching</td>
<td>Reflection, Celebration &amp; Renew</td>
</tr>
</tbody>
</table>

#### Pre-Phase
- **Context**
  - Review of past improvement efforts and lessons learned
  - Preliminary system review: Micro/Meso/Macro
- **Site Visit**
- **Resources**
- **Logistics**
- **Expectations**
  - Clarity of aim
  - Leadership & team discussions about roles and logistics

#### Action Phase
- **Relationships**
  - Helping
  - Keep on track
- **Communication**
  - Virtual
  - Face-to-Face
  - Available & accessible
  - Timely
- **Encouragement**
- **Clarifying**
  - Improvement Knowledge
  - Expectations
- **Feedback**
- **Reframing**
  - Different perspectives
  - Possibility
  - Group dynamics-new skills

#### Transition Phase
- **Expectations**
- **Relationships**
- **Communication**
- **Encouragement**
- **Clarifying**
- **Feedback**
- **Reframing**
- **Improvement Technical Skills**
  - Teaching

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**Team Coaching Framework Over Time**

Pre-Phase, Action Phase, Transition Phase

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Continual Imp. of Health Care

Science of Improvement

Dartmouth Microsystem Improvement Curriculum

Fishbones

Measures

Change Ideas

Specific Aim

Global Aim

Theme

Assessment

Meeting Skills/Group Dynamics

February 2011

VALUE BY DESIGN

Developing Clinical Microsystems to Achieve Organizational Excellence

EUGENE C. NELSON • PAUL B. BATALDEN
MARJORIE M. GODFREY • JOEL S. LAZAR
EDITORS

2007

QUALITY BY DESIGN

A Clinical Microsystems Approach

Eugene C. Nelson
Paul B. Batalden
Marjorie M. Godfrey

91

92
The only realistic hope for substantially improving care delivery is for the old guard to launch a revolution from within.

Existing players must redesign themselves. What does “redesign” mean? Revamping core clinical processes.

It's time for a revolution — led from within.

Fixing Health Care on the Front Lines
by Richard M.J. Bohmer

April 2010
Moving beyond projects

“No single initiative or set of unaligned projects will likely be enough to produce system-level results. Even aligned projects alone will not be sufficient.

It will be necessary to have a pervasive understanding of work as a collection of processes.

The responsibility of managers and supervisors includes continual improvement of work processes under their control.”

Developing Microsystems: The Strategic Advantage

“Organizations that have intentionally developed pervasive improvement capability in their microsystems have a strategic advantage when it comes to accelerating and sustaining system-level improvement. These organizations have an efficient and effective means of getting everyone involved to accomplish their strategic campaign.”
