Clinical Microsystems

An Introduction

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International Clinical Microsystem Festival
March 3, 2011
1:00-2:15
Co-Director, The Dartmouth Institute
Microsystem Academy

Overview

1. Complexity of health care
2. What are clinical Microsystems?
3. Why do they matter?
4. Research and Education
5. Resources
   • The Dartmouth Institute Microsystem Academy
   • Resources and Opportunities
Health Care Systems

• Every day, everywhere 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*
Percent of Diabetic Medicare Enrollees Receiving Annual HbA1c Testing

“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?

Meet Amy!
Continual Imp. of Health 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-complex

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

• control for context
• generalize across contexts
• sample design

• strategy
• operations
• people

• balanced outcome measures

• understand system “particularities”
• learn structures, processes, patterns
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*…

Definition

A health care clinical microsystem can be defined as the combination of a *small group* of people who work together in a defined setting on a regular basis—or as needed—to provide care and the *individuals* who receive that care (who can also be recognized as members of a discrete *subpopulation of patients*.)

It has clinical and business *aims*, linked *processes*, a shared *information* environment and produces services and care which can be measured as performance *outcomes*. These systems evolve over time and are (often) *embedded* in larger systems/organizations.

As any living adaptive system, the microsystem must: (1) do the work, (2) meet staff needs, (3) maintain themselves as a clinical unit.
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 sharp end of the health care system—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
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.

The Big Picture: Inverted Pyramid

- Evidence Base
- Quality Metrics
- Patient & Family Voices
- Local Competition
- Pay for Performance
- JCAHO, CMS NCQA

IHI – Whole System Metrics

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IOM – Chasm
NQF – Metrics
IHI – 100K
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
Microsystems: Where members are in relationship for a purpose in a context...elements include

- A few members we may know as physicians and nurses
- A few other clinically prepared people
- Some clinical support people
- Some administrative support people
- Some members we may know as patients, family members
- "Willie Byte" ... information
- Some technology
- A purpose
- A setting

Evolution of "Clinical Microsystems"

World-wide research and study of best practice service organizations
- CECS course on Micro-units
- HFHS "panels" of patients
- Caring for Pts & Populations
- Clinical Value Compass

Purpose
Processes
Professionals
Patterns
Patients

www.clinicalmicrosystem.org
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
Quinn Research

The front office was fixated on the ongoing perfection of frontline services within SRUs because value and loyalty are created at the customer-provider interface.

Quality, efficiency, timeliness, service excellence, and innovation were designed into frontline work processes of SRUs.

Information flows were engineered into frontline work of SRUs to create supportive, real-time information environments that facilitated swift and correct delivery of services.

The smallest units of activity within frontline SRUs were measured and tracked over time for monitoring, managing, and improving performance.

Increasingly rich information environments were created for the frontline SRUs. Data systems were designed to feed information forward and to feed information back so the right information was at the right place at the right time at the right level of aggregation.

Based on systemic learning, ongoing improvements, and standardization of most effective practices, these best in the world service sector leaders could rapidly grow by replicating frontline SRUs through time and across space, reliably extending the delivery of high-value services.

Dartmouth Study 2002

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Julie J. Mohr, MSPH, PhD
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Linda A. Headrick, MD, MS
John H. Wasson, MD
High Performing Clinical Microsystems

- **Leadership**
  - Leadership
  - Organizational support

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

- **Information & Technology**

- **Performance**
  - Performance results
  - Process improvement

- **Patients**
  - Patient Focus
  - Community & Market Focus

A Special Blend

Theoretical Underpinnings

- **W Edward Deming** (Systems and Shewart)
- **Kerr White**
- **Avedis Donabedian** (Structure Process Outcomes)
- **Kurt Lewin** (Field theory-action research)
- **Bronfenbrenner** (Ecology of human development)
- **Kolb** (Experiential learning)
- **Plsek & Zimmerman** (Complexity Science)
- **Senge** (Learning organization, systems & mastery)
- **Wheatley** (Leadership, Chaos theory)
A Picture Of A Microsystem

The Physiology

A “Generic” Clinical Microsystem Model

- Entry, Assignment
- Orientation
- Initial Work-up, Plan for care
- Disenrollment

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

Satisfaction of need, monitoring, assessment of outputs

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

Biological, Functional, Expectations, Costs

Biological, Functional, Satisfaction, Costs
Supporting Microsystems

People with Healthcare Needs

Prevention

Acute

Chronic

Palliative

People with Healthcare Needs Met

Very High Risk

People with Healthcare Needs

Chronic Healthy

Other Care Locations

Hospital

Home Health

ED/Urgent Care

Nursing Home

Other Clinical Offices

Physical Space

Billing

Referrals

Pharmacy

Radiology

Laboratory

Medical Records

Scheduling

Phone

Nurse

First Info Systems & Data

Functional & Risks

Biological Costs

Satisfaction

Picture of Supporting Microsystem with many Clinical Microsystems
So, why focus on the “clinical microsystem?”

• Basic “building block” of health care as a system
• Unit of clinical policy-in-use
• Locus of most workplace “motivators” and many “hygiene” factors
• Most variables relevant to patient satisfaction controlled here
• Where “good value” and “safe” care is made
• Where most health professional “formation” occurs after initial preparation

It’s where everything happens with, for and to the patient and family.
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.”
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.

“Microsystems are the vital component in any execution strategy”

~ Uma Kotagal, MD
Cincinnati Children's Hospital Medical Center
So, how might you improve your own microsystem?

- It's just like patient care
  - To improve a patient’s health status ... You assess, diagnose, treat, and follow-up based on biomedical and care science
  - To improve a microsystem’s “health” status ... You assess, diagnose, treat, and follow-up based on improvement science and the science of clinical practice

To Develop a Change Culture
“Profound Knowledge”

Professional knowledge
- Professional knowledge
- Personal skills
- Values, ethics

Improvement knowledge
- System
- Variation
- Psychology
- Knowledge

Increased Value for the Patients
Better Outcomes
Improved Workplace
Better System Performance

Paul Batalden
After Deming
Microsystem Development

- Development of microsystems provides the “foundation” for common language, expectations, methodologies and habits.
- Interdisciplinary engagement-including *ALL Learners*
- Leadership, Discipline, Rhythm and Pace
- High performing clinical microsystems are adept at any process, model, method you can introduce them to
- *Buy In vs Ownership*

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
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
The Stages

1. Create awareness of flow of work and interdependencies
2. Test some changes to address some of the “embarrassing stuff”
3. See ourselves as a system of care
4. Respond to strategic challenges and invitations
5. Measure performance
6. Learn to integrate multiple improvement cycles while taking care of patients
7. Unending curiosity about and pursuit of “best known” world class processes and outcomes

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
Quality By Design: A Clinical Microsystems Approach

- Part One
  - Updated original Joint Commission Quality and Safety 9 part series
- Part Two
  - Dartmouth Microsystems Improvement Curriculum

To do things differently, we must see things differently. When we see things we haven’t noticed before, we can ask questions we didn’t know to ask before.

John Kelsch, Xerox
• What do we really know about our patients and families? (or patients/customers if a supporting microsystem)
• What do we know about our work?
  – How do we get things done?
• What do we know about our context?
• What are the patterns we may talk about but we do not study to learn more deeply?

How do we know what the results of...
Continual Imp. of Health Care

Session #2

Dashboards

TDI Microsystem Academy

• Background
  – The Center for Leadership and Improvement (CLI) has devoted a great deal of its energy and resources to the creation of many activities related to Clinical Microsystem Theory.
  – These efforts have been very successful and attracted much interest from colleagues around the world to participate further in the development, implementation and study of the theory and adaptation to local contexts.
  – As we move forward, CLI needs to better organize its resources in conjunction with TDI to make these efforts sustainable and capable of growth and support over time.
  – To accomplish this, we have created the Microsystem Academy within CLI/TDI.
Relationship with TDI

- The Microsystem Academy is housed in the Center for Leadership and Improvement
- The Academy works in close collaboration with other TDI Initiatives and Centers
  - Office of Professional Education and Outreach (OPEO)
  - TDI Centers
- This close partnership allows the Academy to share in many TDI resources
  - Data center, financial planning, e-learning, evaluation, learners, alumni network

Academy Structure

Leadership Team and Governance

Development of New Knowledge
(Measurement, Research & Evaluation)

- Strategic Partners
- Education
- Resources
- Consults
- Patients & Families

TDI Data Center
OPEO & TDI Centers
Learners/Alums
There are several existing venues for education related to Clinical Microsystems:
- TDI course
- Coach the Coach Series
- LPM Residency
- VA Quality Scholars
- Meetings
  - National (Lake Morey)
  - International (Sweden)

There is a significant opportunity for online learning modules to be developed.

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, “Coaching the Coaching” offers an exciting, but rigorous curriculum of experiential learning in the art and science of interdisciplinary microsystems coaching.
The Discipline of Coaching

”...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.”

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Coaching Model

<table>
<thead>
<tr>
<th>Pre-Phase</th>
<th>Action Period</th>
<th>Transition</th>
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<tbody>
<tr>
<td>Clarity of aim</td>
<td>Active coaching</td>
<td>Review and reflect on journey</td>
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<tr>
<td>Leadership discussions</td>
<td>-Expectations</td>
<td>-What to keep doing</td>
</tr>
<tr>
<td>Preliminary system review- Macro/Meso Microsystems Expectations Logistics Selection of interdisciplinary groups Resources</td>
<td>-Clarity and aims/goals</td>
<td>-What to be sure and not do again</td>
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<tr>
<td></td>
<td>Keep on track!</td>
<td>-Assess capability and coach needs</td>
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<tr>
<td></td>
<td>-Group dynamics-new skills</td>
<td>-Reflection, celebration</td>
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<tr>
<td></td>
<td>-Task oriented (key to start change)</td>
<td>-Re-energize for next focus</td>
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<tr>
<td></td>
<td>-Encouragement</td>
<td>-Coach evaluation</td>
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<tr>
<td></td>
<td>-Reframing/Different perspectives</td>
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<td>-Easy availability and access</td>
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<td></td>
<td>-Timely responses</td>
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<td></td>
<td>-More directive specific to process</td>
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</tbody>
</table>

Coaching Intensity Over Time

<table>
<thead>
<tr>
<th>INTENSITY</th>
<th>MONTHS</th>
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<tbody>
<tr>
<td>High</td>
<td>3 6 9 12 18 24</td>
</tr>
<tr>
<td>Low</td>
<td>3 6 9 12 18 24</td>
</tr>
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Session #2
Continual Imp. of Health Care

Model for Improvement

What are we trying to accomplish?
How will we know that a change is an improvement?
What changes can we make that will result in an improvement?
Lessons from the field

Microsystem Series 2008
Joint Commission Journal
www.clinicalmicrosystem.org
CLICK MATERIALS
Click Publications
Part Three

The Joint Commission Journal on Quality and Patient Safety

Continual Improvement of Health Care

Clinical Microsystems

Clinical Microsystems, Part 3. Transformation of Two Hospitals Using Microsystems, Meso systems, and Macro systems Strategies

Margaret M. Gifford, M.S., RN, Craig C. Melo, M.B.A., M.A., Stephen E. Nynka, M.D., Paul R. Pantaleoni, M.D., Eugene C. Napolitano, Ph.D., M.P.H.

In today’s health care, decision-makers face challenges to deliver better patient care. In different ways, they seek to improve efficiency, quality, and value for their patients. This article describes the ongoing transformational journeys of two hospitals in a large, multihospital academic system. One hospital is a general medical center, while the other is a community-based hospital located in a rural area in the Northeastern United States. The two hospitals are similar in size, but very different in mission and culture. The hospitals share a common goal of reducing costs, improving patient satisfaction, and improving the quality of care.

Part Three continues the story of how two hospitals—each a large, multihospital academic system—have undertaken significant transformations to improve the quality of care and patient satisfaction. The hospitals have implemented a variety of strategies to achieve their goals, including the development of new technology, the implementation of new processes, and the creation of new organizational structures.

The story begins with Cleveland Children’s Hospital, a large children’s hospital located in the Northeastern United States. Cleveland Children’s Hospital has a long history of excellence in pediatric care and is known for its innovative treatments and research. In recent years, the hospital has faced significant challenges, including increasing costs and a changing patient population. The hospital leaders decided to embark on a transformational journey to improve patient care and reduce costs.

The hospital implemented several strategies to achieve its goals. These included the development of new technology, the implementation of new processes, and the creation of new organizational structures. The hospital leaders also worked closely with the caregivers to ensure that the transformational journey was successful.

The hospital’s success story is an inspiration to other hospitals around the world. It demonstrates that significant transformations are possible when leaders are committed to improving patient care and reducing costs. The hospital’s success story also highlights the importance of collaboration and innovation in achieving these goals.

The story continues with Allegheny General Hospital, a large community-based hospital located in the Northeastern United States. Allegheny General Hospital has a long history of providing high-quality care to its patients. However, the hospital faced significant challenges in recent years, including increasing costs and a changing patient population.

The hospital leaders decided to embark on a transformational journey to improve patient care and reduce costs. They implemented several strategies to achieve their goals, including the development of new technology, the implementation of new processes, and the creation of new organizational structures. The hospital leaders also worked closely with the caregivers to ensure that the transformational journey was successful.

The hospital’s success story is an inspiration to other hospitals around the world. It demonstrates that significant transformations are possible when leaders are committed to improving patient care and reducing costs. The hospital’s success story also highlights the importance of collaboration and innovation in achieving these goals.

In conclusion, the story of Cleveland Children’s Hospital and Allegheny General Hospital serves as a reminder that significant transformations are possible when leaders are committed to improving patient care and reducing costs. The hospitals’ success stories also highlight the importance of collaboration and innovation in achieving these goals.
Part Four-Mesosystems

The Joint Commission Journal on Quality and Patient Safety

Clinical Microsystems Series
Clinical Microsystems, Part 4: Building Innovative Population-Specific Mesosystems
Karen L. McKee, RN, MPH, ScD; Scott A. Bork; M.S.; Linda A. Larson, M.S.; Mitchell C. Davis, M.D., P.A.-C.; Jennifer L. Niles, MD, MSc; and Brian E. Lee, MD

What would it be like if medical care were a 24/7 operation? It is 2003 and a new leadership style is transforming the healthcare system (Davies, 2003). Continuous improvement is the cornerstone of this new approach to healthcare delivery. The focus is on the patient as an individual, understanding the needs and wants of each person, and providing care that is personalized and effective. This approach is based on the idea of improving the quality of care by continuously identifying and addressing areas for improvement. The result is a system that is more responsive to the needs of patients, leading to better outcomes. This approach is known as the “Patient-Centered Care Model” (PCCM). It emphasizes the importance of patient participation in decision-making and the role of healthcare providers in delivering care that is personalized and responsive to the needs of patients.

Developing a Novel Model of Care Delivery
The approach described in this article is an adaptation of the Patient-Centered Care Model. The model is based on the idea that care delivery should be centered around the needs of patients, and that healthcare providers should work together to deliver care that is personalized and responsive to the needs of patients. The model is designed to improve the quality of care by continuously identifying and addressing areas for improvement, and by ensuring that care is delivered in a way that is responsive to the needs of patients. The model is designed to improve the quality of care by continuously identifying and addressing areas for improvement, and by ensuring that care is delivered in a way that is responsive to the needs of patients.

Article-at-a-Glance
Background: In 2003, the Glazing Health System (Davies, 2003) implemented an innovative approach to care delivery, known as the “Patient-Centered Care Model” (PCCM). This approach was designed to improve the quality of care by continuously identifying and addressing areas for improvement, and by ensuring that care is delivered in a way that is responsive to the needs of patients.

Implementation: The implementation of the PCCM approach involved the collaboration of healthcare providers from across the Glazing Health System. The approach was designed to improve the quality of care by continuously identifying and addressing areas for improvement, and by ensuring that care is delivered in a way that is responsive to the needs of patients.

Conclusion: The PCCM approach has been successful in improving the quality of care delivered by the Glazing Health System. The approach has been adopted by other healthcare providers, and has led to improvements in patient outcomes and satisfaction. The approach described in this article is an adaptation of the PCCM approach, and it is designed to improve the quality of care delivered by healthcare providers in a way that is responsive to the needs of patients.