An Introduction to Using Clinical Microsystems to Improve Healthcare

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About us...

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Today’s Agenda

- Clinical Microsystem overview
- Clinical Microsystems – what and why
- Clinical Microsystems – application, and examples/case study
- Additional resources
Clinical Microsystem - History

James Brian Quinn
- The Intelligent Enterprise, 1992
- Intellect as a core resource
- Focus on the front line

Paul Batalden
- Application to health care
What is a Clinical Microsystem?

...the combination of a small group of people (including the patient) who work together on a regular basis to provide care to a discrete subpopulation of patients.

It has clinical and business aims, linked processes and a shared information environment, and generates performance outcomes.
There is no escaping it – Microsystems Exist!

- Not a verb – not something we do
- Something that is (noun)
- Could be high or low functioning
High Functioning Family “Micro-system”
Or...not so high functioning
High Functioning Clinical Microsystem
Or…not so high functioning
Every System Is Perfectly Designed To Get The Results Its Gets – *Paul Batalden*
10 Characteristics of High Performing Clinical Microsystems

- Leadership
- Organizational Support
- Staff Focus
- Education and Training
- Interdependence
- Patient Focus
- Community and Market Focus
- Performance Results
- Process Improvement
- Information and Information Technology
Systems Within Systems

- Macrosystem
- Mesosystem
- Microsystem

Healthcare Organization
Clinical Practice
Individual care team
The Big Picture

Visit 1 + Visit 2 + Visit 3 + Visit 4 → Quality of Care

Back Office → Clinical Team → Anc Teams → Admin Team

Front Line Managers

Pt & family voices

A B C D E F
Evidence Based

1 2 3 4 5 6
Quality Metrics

Senior Leaders

©Adapted from 2005, Trustees of Dartmouth College, Nelson, January
How Organizations Succeed

The Interaction of Design And Behavior
Together Produce RESULTS
Using Clinical Microsystems as an Improvement Methodology
Clinical Microsystems Improvement Method

Patient Centered

Measurement

Systems Perspective

Empowerment

The Foundation of the Method
The "Path Forward"

Dartmouth Microsystem Curriculum Improvement Ramp

Global Aim

1. Specific Aim
2. Change Ideas
3. Measures

Tools/Skills:
• Effective Meeting Skills
• Group Decision Making
• Data Collection
• Process Mapping
• Fishbone Diagram
• Run Chart
• PDSA

Assessment

Assessment

- The 5 P’s (Green/Workbooks)
  - Purpose
  - Patients
  - Professionals
  - Processes
  - Patterns

Clinical Microsystems
“The Place Where Patients, Families and Clinical Teams Meet

Assessing, Diagnosing and Treating Your Outpatient Primary Care Practice

www.clinicalmicrosystem.org
PURPOSE

“Why are we here?”
PATIENTS

The individuals and their families to whom care and services are provided.
Patient Assessment – Chronic Care from the Greenbook

### Assessment of Care for Chronic Conditions

<table>
<thead>
<tr>
<th>Over the past 6 months, when I received care for my chronic conditions, I was:</th>
</tr>
</thead>
<tbody>
<tr>
<td>None of the Time</td>
</tr>
</tbody>
</table>

1. Asked for my ideas when we made a treatment plan.  
2. Given choices about treatment to think about.  
3. Asked to talk about any problems with my medicines or their effects.  
4. Given a written list of things I should do to improve my health.  
5. Satisfied that my care was well organized.  
6. Shown how what I did to take care of myself influenced my condition.  
7. Asked to talk about my goals in caring for my condition.  
8. Helped to set specific goals to improve my eating or exercise.  
9. Given a copy of my treatment plan.  
10. Encouraged to go to a specific group or class to help me cope with my chronic condition.  
11. Asked questions, either directly or on a survey, about my health habits.  
12. Sure that my doctor or nurse thought about my values, beliefs, and traditions when they recommended treatments to me.  
13. Helped to make a treatment plan that I could carry out in my daily life.  
14. Helped to plan ahead so I could take care of my condition even in hard times.
PROFESSIONALS

Every member of the microsystem who provides care and/or services to the patient.
Professional Assessment – Satisfaction Survey from the Greenbook
PROCESS

Systems in place to care for patients.
### Primary Care Practice Patient Cycle Time

**Day:** ____________  **Date:** ____________

<table>
<thead>
<tr>
<th>Scheduled Appointment</th>
<th>Time</th>
<th>Provider you are Seeing Today</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time</strong></td>
<td></td>
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</tr>
<tr>
<td>1. Time you checked in.</td>
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<tr>
<td>2. Time you sat in the waiting room.</td>
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<td>3. Time staff came to get you.</td>
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<td>4. Time staff member left you in exam room.</td>
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<td>6. Time provider came in room.</td>
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<td>8. Time provider left the room.</td>
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<td>7. Time you left the exam room.</td>
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<td>9. Time you arrived at check out.</td>
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<tr>
<td>9. Time you left practice.</td>
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</tbody>
</table>

**Comments:**
PATTERNS

What we “just do”
Patterns

- Patterns can be found through tracking the volumes and types of telephone calls. Review the categories on the telephone tracking list to ensure they reflect the general categories of calls your practice receives. Ask clerical staff to track the telephone calls over the course of a week to find the patterns of each type of call and the volume peaks and valleys.
- Put a tally mark each time one of the phone calls is for one of the listed categories. Total the calls for each day and then total the calls in each category for the week. Note the changes in volume by the day of the week and am/pm.

### Primary Care Practice Telephone Tracking Log

<table>
<thead>
<tr>
<th>Week of</th>
<th>Monday AM</th>
<th>Monday PM</th>
<th>Tuesday AM</th>
<th>Tuesday PM</th>
<th>Wednesday AM</th>
<th>Wednesday PM</th>
<th>Thursday AM</th>
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<th>Friday AM</th>
<th>Friday PM</th>
<th>Saturday AM</th>
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<th>Week Total</th>
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<td>Appointment for Future</td>
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</tbody>
</table>
The Assessment Phase!

Processes
- Review, adapting, and distributing the Core and Supporting Processes evaluation forms to all practice staff. Ensure the forms accurately reflect the practice and then use staff to evaluate the current state of these processes.
- Suggest improvements to each process based on the feedback of the assessment.
- Special care practice: Know your processes core and supporting processes.

<table>
<thead>
<tr>
<th>Specialty Care Practice</th>
<th>Know Your Processes</th>
<th>Core and Supporting Processes</th>
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<tbody>
<tr>
<td></td>
<td>Works Well</td>
<td>Small Problem</td>
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<td>Answering Phones</td>
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<td>Appointment System</td>
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<td>Scheduling Procedures</td>
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<td>Scheduling of Procedures</td>
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<tr>
<td>OR Procedures</td>
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<tr>
<td>Minor Procedures</td>
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<tr>
<td>Diagnostics</td>
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<tr>
<td>Filling for patients, Test Results, Medication...</td>
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<tr>
<td>Prescriptions Renewal</td>
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<tr>
<td>Receiving Referrals</td>
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<td>Pre-authorization for Services</td>
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<tr>
<td>Billing/Coding</td>
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<td>Phone Advice</td>
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<tr>
<td>Assignment of Patient...</td>
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<td>New Patient...</td>
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<tr>
<td>Palliative Care</td>
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</tbody>
</table>
5P Wall Chart
The "Path Forward"

Dartmouth Microsystem Curriculum Improvement Ramp

**Global Aim**

**Theme**

**Specific Aim**

**Change Ideas**

**Measures**

**Tools/Skills:**
- Effective Meeting Skills
- Group Decision Making
- Data Collection
- Process Mapping
- Fishbone Diagram
- Run Chart
- PDSA

Theme Examples

- Efficiency
- Access
- Safety
- Patient Satisfaction
Theme Example – RAMCCC

- **Efficiency**
  - Prescription refill turn around
  - Reducing hold times on the phone
  - Reducing check-in procedure
The "Path Forward"

Dartmouth Microsystem Curriculum Improvement Ramp

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Assessment

Theme

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Change Ideas

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PDSA

Global Aim

Change

Ideas

Specific Aim

Assessment

Sample Global Aim

We aim to ____________.

The process begins with __________ and ends with _________________.

By working on this process we expect _________________.

It is important to work on this now because _________________.

Sample Global Aim

We aim to improve patient access to provider in the ABC Practice.

The process begins with the patient calling for an appointment and ends with the patient being scheduled with their provider of choice.

By working on this process we expect to increase patient satisfaction, provider satisfaction and increase availability to access provider of choice. It is important to work on this now because of the lengthy wait time of appointment being scheduled.
Principles of an Effective Global Aim Statement

- State aim clearly
- Focus on a PROCESS improvement
- Focus on Patients/Families
- Follow template to determine boundaries
- Avoid aim drift
- Be prepared to fully shift aim if necessary
The "Path Forward"

Dartmouth Microsystem Curriculum Improvement Ramp

Assessment

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SDSA

PDSA

Tools/Skills:
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Global Aim

Improvement Ramp

Global Aim

1

2

3

Dartmouth Microsystem Curriculum Improvement Ramp

The "Path Forward"
Sample Specific Aim

We will decrease the number of days to 3rd next available for a complete physical exam from 63 days to 14 days by September 17, 2012.
The "Path Forward"

Dartmouth Microsystem Curriculum Improvement Ramp

**Tools/Skills:**
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**Assessment**

**Global Aim**

**Specific Aim**

**Change Ideas**

**Measures**

**PDSA**

**Improvement Ramp**

**SDSA**
Where Do Change Ideas Come From?

- Best evidence
- Change concepts – (eliminate waste, improve flow, manage variation)
- “Pain Points”
- Brainstorming
Change Ideas – Brainstorming!

- Include refill all scripts at every visit
- Data sheet all scripts in a master list to locations
- Ways refill can occur:
  - 28 day prescriptions
  - Streamline pt. request process
- Reduce 7 nurse/responsibilities/day
- Eliminate green sheet – use technology
  - Update pham w/fax numbers, ask pt.
  - Pham: do all scripts
- Patient education (will protocol)
  - Only refill scripts for correct
  - Form list in each record
- When checked in have list of refills needed provided
- Have clinic point person
- Allow those in proper role to work on refill line
  - Better communication

- Give patient a list of medications
- Pt. reviews med list at start of visit & review
- Ask pt. their preference for refill
- Flagging system for refill needs
- Draw at dream flow process & redesign
- Expand protocol – so pts. don’t have to sign off
  - All refills in one point

Parking lot:
- All scripts policy authorize/document that Refills done, pt. in “Silent”
- If info not complete
- Meds have separate protocol
  - Patient summary & refill process
The "Path Forward"

Dartmouth Microsystem Curriculum

Improvement Ramp

Tools/Skills:
- Effective Meeting Skills
- Group Decision Making
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- PDSA

Global Aim

Assessment

Specific Aim

Change Ideas

Measures

PDSA

1. Global Aim
2. PDSA
3. SDSA

Dartmouth Microsystem Curriculum Improvement Ramp

The "Path Forward"
Measures – simple tics and tallys
Percentage of Form Task Completion by Week
## Baseline Measurement

<table>
<thead>
<tr>
<th>Request origin</th>
<th># of requests/# days</th>
<th>N</th>
<th>Average request/day</th>
<th>% within 48 hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task list</td>
<td>19-34 requests q 2 hrs</td>
<td>23</td>
<td>26/day</td>
<td>60%</td>
</tr>
<tr>
<td>Pharmacy fax</td>
<td>17 requests over 6 days</td>
<td>17</td>
<td>2.8/day</td>
<td>75%</td>
</tr>
<tr>
<td>Nurse line</td>
<td>7 requests over 5 days</td>
<td>7</td>
<td>1.4/day</td>
<td>86%</td>
</tr>
<tr>
<td>Script line</td>
<td>11 requests over 6 days</td>
<td>11</td>
<td>1.8/day</td>
<td>99%</td>
</tr>
</tbody>
</table>

**% filled within 48 hrs**

![Bar chart showing percentage filled within 48 hours for different categories]
Improvement Tools
Process Maps

- Help team members understand what is happening now in a process
- It is important to flowchart the current process, not the desired process, unless...
Sample Process Map
Sample Process Map
Flowcharting the process

- Request for refill
- Electronic task list
- Switch board call
- Direct provider contact
- Refill line taken by nurse, looks up info, and makes green slips
- CSR call
- Direct Nurse call/contact
- Pharmacy fax
- Walk in
- Provider e-refills
- Provider sends to nurse for e-refill
- Nurse completes green sheet for provider to initial
- Filled in chart
- NO
- Does script meet protocol?
- YES
- Nurse e-prescribes
- Green sheet for provider
- Filled in chart
- LNA rooms patient and highlights refill needs
- No notes prescription needs
- E-prescribes refill
- Asks support staff to e-prescribe
Fishbone (Cause & Effect) Diagrams

- Fishbone diagrams are a way to organize your thinking about the possible causes or solutions to a problem.
- The ideas generated by working on a fishbone need to be confirmed with data.
- The ideas from a fishbone can be used to generate one or more specific aims or change ideas.
The "Path Forward"

Dartmouth Microsystem Curriculum

Improvement Ramp

Global Aim

Assessment

Theme

Specific Aim

Change Ideas

Measures

Tools/Skills:
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PDSA

SDSA

Dartmouth Microsystem Curriculum Improvement Ramp

Tools/Skills:
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Plan  Do  Study  Act
Why Test Changes?

- Increases belief that the change will result in improvements in your setting
- Learn how to adapt the change to conditions in your setting
- Evaluate the costs and “side-effects” of changes
- Minimize resistance when spreading the change throughout the organization
THE PDSA CYCLE

Act
- What changes are to be made?
- Next cycle?

Plan
- Objective
- Questions and predictions (why)
- Plan to carry out the cycle (who, what, where, when)

Study
- Complete the analysis of the data
- Compare data to predictions
- Summarize what was learned

Do (small scale)
- Carry out the plan
- Document problems and unexpected observations
- Begin analysis of the data

Change, Keep or Toss?
TIPS FOR SUCCESSFUL TESTS OF CHANGE

- Plan multiple cycles for a test of a change
- Think a couple of cycles ahead
- Scale down the size of the test (the number of patients or location)
- Test with volunteers
- Be innovative to make the test feasible
- Collect useful data during each test
- Test over a wide range of conditions. Test quickly; ask, "What change can we test by next Tuesday?"
## The Three Faces of Performance Improvement

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Improvement</th>
<th>Accountability</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aim:</strong></td>
<td>Improve Care</td>
<td>Compare, reassure, spur change</td>
<td>New knowledge</td>
</tr>
<tr>
<td><strong>Methods:</strong></td>
<td></td>
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<tr>
<td>• Test observable</td>
<td>Yes</td>
<td>N/A – evaluate current performance</td>
<td>Test blind or controlled</td>
</tr>
<tr>
<td>• Bias</td>
<td>Accept stable bias</td>
<td>Adjust data to reduce bias</td>
<td>Design to eliminate</td>
</tr>
<tr>
<td>• Sample size</td>
<td>Just enough data-small sequential samples</td>
<td>N/A – report 100%</td>
<td>Just in case data</td>
</tr>
<tr>
<td>• Hypothesis flexible</td>
<td>No-revised as learn and test</td>
<td>No hypothesis</td>
<td>Fixed hypothesis</td>
</tr>
<tr>
<td>• How to determine improvement</td>
<td>Run or Shewhart control charts</td>
<td>No focus on change</td>
<td>Hypothesis, statistical tests: F-test, t-test, chi square, p value</td>
</tr>
<tr>
<td>• Testing strategy</td>
<td>Small sequential tests</td>
<td>No tests</td>
<td>1 large test</td>
</tr>
<tr>
<td>• Data confidential</td>
<td>Data used only by those involved in improvement</td>
<td>No subjects-data is for public</td>
<td>Subjects protected</td>
</tr>
</tbody>
</table>

Source: Institute for Healthcare Improvement 2010
PDSA Worksheet

**PLAN-DO-STUDY-ACT**

Team/Practice Name: ____________________________

Objective: ____________________________________

Predictions (what do we think will happen and why?): ________________________________________

**PLAN** for change or test and collection of data:

<table>
<thead>
<tr>
<th>Tasks to be completed to run test of change</th>
<th>Who</th>
<th>When</th>
<th>Tools Needed</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
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</table>

**DO:** Carry out the change or test; Collect data and begin analysis.

**STUDY:** Complete analysis of data and compare to your predictions; Summarize what was learned.

**ACT:** Refine the change based on what was learned from the test. Plan for the next cycle.

Outcomes

RESULTS
Improvements to Medication Refill Process

1. Collected data to measure
   - Number of inbound prescription refill calls
   - Average length of call (1.83 min)

2. Redesigned process for incoming faxes to segregate refill requests from all others

3. Changed message on automated refill line to set realistic expectations for patients

4. Educated staff to direct refill requests to automated refill line rather than to triage staff

5. Re-sampled data to measure results of improvement

6. Next Step: Measure Patient Satisfaction

**Total Triage Time Spent on Refill Calls**

(# calls x 1.83 min avg/call)

Reduced from **high of 84 min/day**
To **low of 11 min/day**

Saved 6 hours/week!
Anesth.

START TIME DELAYS: MINUTES

2nd patient blood sugar management

Add on

Provider late

Colo's ran late, Missing H+P, and anesthesia at lunch
Lessons Learned

- Project focus vs. learning organization
- Long-term commitment
- Importance of context
- Art vs. science
Resources

- Clinical Microsystems Website
  - clinicalmicrosystem.org

- Coaching Microsystems program
  - www.mpin.org
  - http://clinicalmicrosystem.org/events/ctc/

- Literature
  - Fifth Discipline, Peter Senge
  - The Team Handbook