Teaching Quality Improvement

Linda A. Headrick, M.D., M.S.
University of Missouri-Columbia
headrickl@health.missouri.edu
How do we graduate physicians able and expecting to improve care?
### Educating a Physician Able and Expecting to Improve Care

<table>
<thead>
<tr>
<th>Foundation Concepts, Skills &amp; Values</th>
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Key Questions

• What should we teach?
• How should we teach?
• How will we measure the results?
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Core Content Areas

- Knowledge of the needs and preferences of those we serve (“customer knowledge”)
- Health care as a process, system
- Variation and measurement
- Leading, following and making changes in health care
- Collaboration
- Developing new locally useful knowledge
- Social context & accountability
- Professional subject matter

IHI 1998
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IHI 1998
Key Questions

• What should we teach?
• How should we teach?
• How will we measure the results?
Key Principles Informing Teaching Methods

• Professional knowledge must be combined with knowledge for improvement.
• It is helpful to combine didactic and experiential learning.
Methods for Medical Students

- Projects to improve medical education
- Case analysis (Headrick 1992)
- Chart audit and analysis (Henley 2002)
- Interprofessional student team projects in hospital, community or rural sites (Baker 1998, Headrick 2000, Blue 2001)
- Improvement projects as part of longitudinal clinical experiences (Weeks 2000, Gould 2002)
Methods for Residents

• Resident teams to improve the residency (Ellrodt 1993)
• Chart audits, peer & self (Paukert 2003, Ziegelstein 2004)
• Guideline design & implementation (Frey et al 2003)
• Improvement projects
Key Questions

• What should we teach?
• How should we teach?
• How will we measure the results?
  – Learner assessment
  – Program evaluation
Learner Assessment

- Tests of knowledge
- Self assessed attitudes & skills
- Problem solving
- Performance-based assessments
Program Evaluation

• Learner performance
• Learner satisfaction
• Faculty feedback
• Costs
• Clinical outcomes
Educating a Physician Able and Expecting to Improve Care

- Foundation Concepts, Skills & Values
  - Beginning Medical Student
  - Advanced Medical Student
- Limited Applications
  - Beginning Resident
  - Advanced Resident
- Expanded Applications
- Demonstrated Basic Competency
Example: Teaching Improvement to Medical Students

• Core Curriculum Year 1-2 at the University of Missouri-Columbia
  – Problem Based Learning
  – Introduction to Patient Care (IPC)
  – Ambulatory Care Experience

• Year 1 White Coat Ceremony
  – “The health of our patients is our first priority. The highest quality health care is the environment for the highest quality education of future physicians.”
  – “Committed to improving quality and safety”

Madigosky et al 2004
Year 2 IPC Modified Root Cause Analysis: Objectives

- Identify the gaps in quality within the cases
- Participate as a team member to identify strategies to close the gap
- Demonstrate an appreciation for an interprofessional approach

Madigosky et al 2004
Year 2 IPC Modified Root Cause Analysis: Methods

• Interdisciplinary teams
  – Year 2 medical students
  – Year 4 nursing students
  – Year 2 MHA graduate students
  – Pharmacy trainees

• Each team analyzed a patient case
  – What happened?
  – Why did it happen?
  – What would prevent it from happening again?

Madigosky et al 2004
Year 2 IPC Modified Root Cause Analysis: Student Feedback

IP Useful

Benefit

Recommend

1=Strongly Disagree, 5=Strongly Agree

12345

All Students Medical Students

Madigosky et al 2004
Educating a Physician Able and Expecting to Improve Care

- **Foundation Concepts, Skills & Values**
  - Beginning Medical Student
  - Advanced Medical Student

- **Limited Applications**
  - Advanced Medical Student

- **Expanded Applications**
  - Beginning Resident

- **Demonstrated Basic Competency**
  - Advanced Resident
Example: Teaching Improvement to Residents

- MetroHealth-Dartmouth non-randomized, matched controlled trial
- Internal medicine residents (11 subjects, 22 controls)

Ogrinc et al 2004
MetroHealth-Dartmouth Objectives

1. Describe the connection between professional knowledge and improvement knowledge
2. Develop and focus an aim for an improvement project
3. Understand a structured approach to improvement
4. Describe why and how various disciplines must work together to achieve improvement
5. Demonstrate how data can be collected under time and resource limitations; appropriately display and analyze data
6. Use diagrams to understand the process under study
7. Identify areas to change within a process and recognize whether changes are successful

Ogrinc et al 2004
MetroHealth-Dartmouth Methods

- Combination of didactic & experiential learning in a one-month elective
- Resident projects: Part of existing improvement initiatives or resident-generated
- Core faculty plus project sponsors

Ogrinc et al 2004
MetroHealth-Dartmouth Measures

- Faculty evaluation of end-of-rotation resident presentation
- Quality Improvement Knowledge Application Tool (QIKAT), pre-post
- Knowledge and skills self-assessment, pre/post & 6-8 months later
- Resident satisfaction
- Project sponsor feedback
- Faculty & resident time logs

Ogrinc et al 2004
Example Resident Projects

- Coordinating follow-up after admission for acute pain crisis in sickle cell disease
- Decreasing barriers to advance care planning in the outpatient setting
- Assessing osteoporosis knowledge and risk factors of patients in primary care
- Increasing the use of maximum sterile barrier precautions in the MICU

Ogrinc et al 2004
Difficulty/Variation in Getting Supplies

Locked Cabinet (triple lumens)

Unlocked Cabinet (gowns, sheets, individual towels)

Nurse with Keys

Patient Room (patient, gauze, Betadine, line caps, needle drivers, saline, syringes)

Resident

Supply Room #1 (Cordis, arterial line)

Supply Room #2 (additional suture, masks, caps)
How the System Has Changed

Locked Cabinet
Unlocked Cabinet
Line Cart

Resident

Patient
MetroHealth-Dartmouth Results

• Faculty rated project presentations highly
• QIKAT scores for participants improved; controls showed no change
• Participants’ ratings of 9/10 self-assessment items increased and remained elevated at 6 months

Ogrinc et al 2004
Results

QIKAT scores

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<tr>
<th>QIKAT Score</th>
<th>Pretest</th>
<th>Posttest</th>
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<tbody>
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<td>7</td>
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Average QIKAT Score

- Subjects
- Controls
Participants rated experience highly re: achievement of learning objectives
- “Like putting on a new pair of glasses”
- “This training should be mandatory for all residents”

Project sponsors appreciated resident assistance with projects

Ogrinc et al 2004
Cost = Time

• Subjects averaged 119 hours (range 41-232) over the four weeks
• Faculty averaged 6 hours (range 3.3 - 8) over the four weeks
• Project sponsors averaged 1-2 hours/week

Ogrinc et al 2004
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What’s Next?

• IHI Medical School Collaborative
  – Aim: Create 10 exemplar schools in 3 years and 60 schools in 6 years
• Accreditation Council for Graduate Medical Education
• Professional boards and societies
• Quality Improvement in Medical Education (QIMED) faculty development workshops
References

- Accreditation Council for Graduate Medical Education. Outcome Project. [http://www.acgme.org/outcome/project/proHome.asp].
References cont’d

References cont’d

- O’Connor GT, Plume SK, Olmstead EM, Morton JR et al. A Regional Intervention to Improve the Hospital Mortality Associated with Coronary Artery Bypass Graft Surgery. JAMA 1996;275:841-846