Improving Quality and Outcomes of Care through the Practice of Evidence-based Management

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Top Ten Causes of Death

Heart Disease
Cancer
Cerebrovascular Disease
Chronic Obstructive Pulmonary Disease
Unintentional Injury
Pneumonia and Influenza
Diabetes
HIV/AIDS
Suicide
Homicide

Revised Top Ten Causes of Death

Heart Disease
Cancer
Cerebrovascular Disease
Chronic Obstructive Pulmonary Disease

Preventable Medical Errors
Unintentional Injury
Pneumonia and Influenza
Diabetes
HIV/AIDS
Suicide
• 44,000 to 98,000 deaths per year due to preventable medical errors (based on Lucian Leape’s work)

• Cause
  - Individuals?
  - Underlying Systems?
<table>
<thead>
<tr>
<th>Sigma level $^a$</th>
<th>Defects per million opportunities</th>
<th>Selected health care examples $^b$</th>
<th>Selected industrial examples $^c$</th>
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<tbody>
<tr>
<td>6</td>
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<td>Allied-Signal: 3 model factories Publishing: one misspelled word in all the books in a small library</td>
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<td>4.3</td>
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<td>Airline fatalities</td>
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<td>5.4</td>
<td>Deaths caused by anesthesia during surgery</td>
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<td>10-16</td>
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<td>2 Siebe plants in Italy and United Kingdom, making temperature controls for refrigerators</td>
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<td>Sigma level&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Defects per million opportunities</td>
<td>Selected health care examples&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Selected industrial examples&lt;sup&gt;c&lt;/sup&gt;</td>
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<td>4</td>
<td>6,210</td>
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<td>Airline baggage handling</td>
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<td>Restaurant billing</td>
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<tr>
<td>10,000</td>
<td>1% of hospitalized patients injured by negligence</td>
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<tr>
<td>Sigma level (^a)</td>
<td><strong>Defects per million opportunities</strong></td>
<td><strong>Selected health care examples (^b)</strong></td>
<td><strong>Selected industrial examples (^c)</strong></td>
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<td>66,800</td>
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<td>Publishing: 7.6 misspelled words per page in a book</td>
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<tr>
<td></td>
<td>210,000</td>
<td>21% of ambulatory antibiotics for colds</td>
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<td>2</td>
<td>308,000</td>
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<tr>
<td></td>
<td>580,000</td>
<td>58% of patients with depression not detected or treated adequately</td>
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<td>1</td>
<td>690,000</td>
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<tr>
<td></td>
<td>790,000</td>
<td>79% of eligible heart attack survivors fail to receive beta blockers</td>
<td>____</td>
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</tbody>
</table>

\(^a\) For sigma levels of defects, see Walmsley (1997).

\(^b\) For a discussion of health care examples, see text.

\(^c\) For industrial examples, see Behara, Fontenot, and Gresham (1995) and Jackson (1997).
The Financial Consequences of Poor Quality

- Preventable ADEs cost twice as much as nonpreventable ones
- The average cost associated with a preventable ADE was $4,685
- Hospitals in the study lose $2.8 million each year on preventable ADEs

“The United States has poured enormous resources into practitioner training and very little into improving processes in the systems within which those practitioners work, and it is time to redress that balance.”

Stephen F. Jencks et al., “Quality of Medical Care Devoted to Medicare Beneficiaries…,” *JAMA*, Oct. 4, 2000, p. 1676.
“To emphasize the importance of organizational factors in determining quality - in its many dimensions - is also to underline one of the main problems faced by policymakers. This is that relations between structures, process and outcomes is poorly understood . . . Yet there is increasing evidence that organizational structures and cultures are an important factor in determining the quality of clinical care. . .”

“The transforming insight for medicine from human factors research is that errors are rarely due to personal failing, inadequacies, and carelessness. Rather, they result from defects in the design and conditions of medical work that lead careful, competent, caring physicians and nurses to make mistakes that are often no different from the simple mistakes people make every day, but which have devastating consequences for patients. Errors result from faulty systems not from faulty people, so it is the systems that must be fixed. Errors are excusable; ignoring them is not.”

What’s the problem?

We have a lot of unwarranted variation in clinical practice variation that can be harmful to patients.
THREE QUESTIONS

1) What might account for the large amount of unwarranted variation in quality and outcomes of care?

2) Why isn’t evidence-based medicine and evidence-based management more widely applied in practice?

3) Why are there no health care organizations that provide uniformly high quality of care across the board?
Four Levels of Change for Improving Quality

- Individual
- Group/Team
- Organization
- Larger System / Environment
Individual Level Examples
Education
Academic Detailing
Data Feedback
Benchmarking
Guideline, Protocol, Pathway Implementation
Leadership Development

Group / Team Level Examples
Team Development
Task Redesign
Clinical Audits
Breakthrough Collaboratives
Guideline, Protocol, Pathway Implementation

Organization Level Examples

- Quality Assurance
- CQI / TQM
- Organization Development
- Organization Culture
- Organization Learning
- Knowledge Management

Larger System / Environment Examples

- National Commissions
- Accrediting / Licensing Agencies (NCQA, JCAHO)
- Public Disclosure (“Report Cards,” etc.)
- Payment Policies
- Legal Systems

Evidence-Based Characteristics of Effective Teams

- Size matched to nature of task or problem
- Manage status differences
- Clarify norms governing performance
- Clearly established roles for individuals and team as a whole
- Establish clear goals and expectations
Evidence-Based Characteristics of Effective Teams (cont.)

- Respond to changing needs
- Implement timely, accurate, and open communication
- Encourage creative problem-solving
- Manage conflict constructively

SOME KEY FINDINGS

Medicare mortality lower among hospitals known for good nursing care - particularly the ability to coordinate across units

Source: Aiken, Sochalski, and Lake, Medical Care, 1997.
National Study of 42 Intensive Care Units

- Nursing leadership, ability to manage conflict, and better care coordination positively associated with lower risk-adjusted length of stay, lower nurse turnover, better evaluated technical quality of care and ability to meet family member needs.

STUDY OF 3,000 CABG PATIENTS IN 16 HOSPITALS

- A group-oriented, collaborative, participative culture was significantly associated with higher patient physical and mental functional health status scores six months post-discharge and shorter post-operative intubation times.

Hospital top management leadership is positively associated with greater clinical involvement in TQM

- Linkage to organization’s mission and strategic priorities
- Allocation of human and financial resources
- Aligning compensation and performance appraisal systems
- Personal involvement in teaching TQM and participating on project teams
- Targeting selected physicians
- Developing a supportive culture

In a nine hospital study of patients with total hip and total knee replacement, relational coordination was significantly associated with less post-operative pain, greater post-operative functioning, and shorter length of stay.

Increased Beta Blocker Use After Myocardial Infarction

Hospitals with greater improvement were distinguished by four characteristics:

- Shared goals for improvement
- Substantial administrative support
- Strong physician leadership
- Credible data feedback

CARE SYSTEMS MORE IMPORTANT THAN INDIVIDUAL SPECIALTY DIFFERENCES

- Cochrane collaborative review of specialty differences in diabetic treatment outcomes found that physicians in any specialty practicing in well organized care settings had better outcomes than physicians of any specialty practicing in less well organized care settings.

Similarly trained primary care physicians practicing in different organizational environments provided significantly different quality of care for diabetic patients after adjusting for patient characteristics.

MOST IMPORTANT FACTORS IN REPLICATING EFFECTIVE SYSTEMS OF CARE

• Executive and governance level support for innovation and improvement efforts
• Strong, focused and sustained clinical leadership
• Collaboratively functionary multi-disciplinary teams
MOST IMPORTANT FACTORS IN REPLICATING EFFECTIVE SYSTEMS OF CARE (cont.)

- Explicit attention to development of systems of care
- Effective information systems
- A focus on patient needs

REDESIGN PRINCIPLES

• Patients and families are at the center of care delivery systems.
• Teams led by RNs deliver care.
• Work is organized around the patient.
• A patient is asked for information only once.
• Activities and issues are managed on a real time basis.
• The number and type of personnel caring for the patient is appropriate.
• Patients and providers are provided with opportunities for input into redesign.
• Patients will know who is providing their care.
• Uniform competency criteria will be provided for staff across the system.
• For any process, the least number of process steps, the least number of decision points, and the least number of people will be the goal.
• Undesirable movement of patients, materials, and staff will be decreased.
• Information and resources will be located as close to the work as possible.

Source: York Hospital, York, Pennsylvania
Community Resources and Linkages

Organizational Leadership and Practices

Health Care Team Redesign

Informed
Activated
Patient

Prepared
Proactive
Team

Productive Interactions

Community Resources and Linkages

- Effective programs
- Partnerships
- Coordination
Organizational Leadership and Practices

- Senior leaders
- Goals
- Benefits
- Provider incentives
- Improvement strategy
Health Care Team Redesign: Self-management Support

- Emphasis on the patient role
- Standardized assessment
- Effective interventions
- Care-planning and problem-solving
Health Care Team Redesign: The Visit

- Team roles and tasks
- Planned visits
- Continuity
- Regular follow-up
Health Care Team Redesign: Decision Support

- Evidence-based guidelines
- Specialist expertise
- Provider education
- Reminders
Health Care Team Redesign: Clinical Information System and Registry

- Population-based planning
- Feedback
- Individual Treatment Plan
<table>
<thead>
<tr>
<th>Strategic</th>
<th>Cultural</th>
<th>Technical</th>
<th>Structural</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>No significant results on anything really important</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>Small, temporary effects; no lasting impact</td>
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<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>Frustration and false starts</td>
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<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>Inability to capture the learning and spread it throughout the organization</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Lasting organization-wide impact</td>
</tr>
</tbody>
</table>

a 0 = absent; 1 = fully present.

Source: Adapted from S.M. Shortell et al. (1996, 159).
Crossing the Quality Chasm: A New Health System For The 21st Century

Institute of Medicine
National Academy of Sciences

March, 2001
Simple Aims for a Health System

Care for patients should be:

• Safe
• Effective
• Efficient
• Timely
• Personalized
• Equitable

Three Over Arching Principles

Patient–centeredness

System–mindedness

Evidence-based
Some Simple Rules for a Health System

OLD RULES

• 8-5
• First, as individual, do no harm
• Experience-based practice
• Professional autonomy drives variability
• Provide care based on visits

NEW RULES

• 24-7-365
• First, as a health system, do no harm
• System acquired knowledge - standardize on excellence
• Patient differences and preferences drive variability
• Provide care based on healing relationships
## Some Simple Rules for a Health System

<table>
<thead>
<tr>
<th>OLD RULES</th>
<th>NEW RULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Information is a record</td>
<td>• Information is key to human relationship</td>
</tr>
<tr>
<td>• Professionals control care</td>
<td>• The patient is the source of control</td>
</tr>
<tr>
<td>• Secrecy is necessary</td>
<td>• Transparency is necessary</td>
</tr>
<tr>
<td>• React to needs</td>
<td>• Anticipate needs</td>
</tr>
<tr>
<td>• Health care value is driven by costs</td>
<td>• Health care value is driven by ... achieving patient-centered outcomes and cost</td>
</tr>
</tbody>
</table>

Some Simple Rules for a Health System

OLD RULES

• Professional roles trump collaborative work

• Design for both the usual and unusual

NEW RULES

• Collaborative work trumps professional rules

• Design for the usual, plan for the unusual

Source: IOM Subcommittee on Designing the 21st Century Chassis, Washington, D.C.
Current Dominant Logic

Autonomous professionals providing largely self-defined expert care within organizational payment, and regulatory environments involving conflicting incentives, goals, and objectives.
New Dominant Logic

Patient-centered teams providing evidence-based medicine in supportive organizational, payment, and regulatory environments.
New Redesign Rules

1. *Care based on continuous healing relationships.* Patients should receive care whenever they need it and in many forms, not just face-to-face visits. This rule implies that the health care system should be responsive at all times (24 hours a day, every day) and that access to care should be provided over the Internet, by telephone, and by other means in addition to face-to-face visits.
2. **Customization based on patient needs and values.** The system of care should be designed to meet the most common types of needs, but have the capability to respond to individual patient choices and preferences.

3. **The patient as the source of control.** Patients should be given the necessary information and the opportunity to exercise the degree of control they choose over health care decisions that affect them. The health system should be able to accommodate differences in patient preferences and encourage shared decision making.
4. **Shared knowledge and the free flow of information.** Patients should have unfettered access to their own medical information and to clinical knowledge. Clinicians and patients should communicate effectively and share information.

5. **Evidence-based decision making.** Patients should receive care based on the best available scientific knowledge. Care should not vary illogically from clinician to clinician or from place to place.
6. **Safety as a system property.** Patients should be safe from injury caused by the care system. Reducing risk and ensuring safety require greater attention to systems that help prevent and mitigate errors.

7. **The need for transparency.** The health care system should make information available to patients and their families that allows them to make informed decisions when selecting a health plan, hospital, clinical practice, or choosing among alternative treatments. This should include information describing the system’s performance on safety, evidence-based practice, and patient satisfaction.
8. *Anticipation of needs.* The health system should anticipate patient needs, rather than simply reacting to events.

9. *Continuous decrease in waste.* The health system should not waste resources or patient time.

10. *Cooperation among clinicians.* Clinicians and institutions should actively collaborate and communicate to ensure an appropriate exchange of information and coordination of care.
Making change possible

CARE SYSTEM

Supportive payment and regulatory environment

Organizations that facilitate the work of patient-centered teams

High performing patient-centered teams

Outcomes:
- Safe
- Effective
- Efficient
- Personalized
- Timely
- Equitable

REDESIGN IMPERATIVES: SIX CHALLENGES
- Redesigned care processes
- Effective use of information technologies
- Knowledge and skills management
- Development of effective teams
- Coordination of care across patient conditions, services, and settings over time.
- Use of performance and outcome measurement for continuous quality improvement and accountability
Some Previous Observations

“In attempting to arrive at the truth, I have applied everywhere for information, but in scarcely an instance have I been able to obtain hospital records fit for any purposes of comparison. If they could be obtained, they would enable us to decide many questions... They would show subscribers how their money was being spent, what amount of good was really being done with it, and whether the money was not doing mischief rather than good.”

Florence Nightingale, *Notes on a Hospital*, 1873.
Some Previous Observations (cont.)

“Hospitals, if they wish to be sure of improvement must find out what their results are, must analyze their results, to find their strong and weak points, must compare their results with those of other hospitals, (and) must welcome publicity not only for their successes, but for their errors, so that the public may give them their help when it is needed.”

“Such opinions will not be eccentric a few years hence.”

Earnest A. Codman, M.D., *A Study in Hospital Efficiency*, 1916.
“The Problem Is with the System and the System Belongs to Management”

W. Edwards Deming