Quality Improvement: Raising the Bar

Mark L. Zeidel, M.D
Herrman L. Blumgart Professor of Medicine
Harvard Medical School
Physician in Chief and Chair, Department of Medicine
BIDMC, Boston, Massachusetts
A Case

An 82 year old man is brought to the ER of a prominent academic medical center

CC: Fever, cough and delirium. His daughter, a physician, noted incoherent speech on the phone, and had him brought into the ER.

PMH: CKD, prior hypertension, ulcerative colitis with total colectomy, spinal stenosis with kyphosis. Normal mental status (he day trades with great success).

ER PEx: A confused, frail elderly man, febrile to 38.5 °C, BP 100/60, P 110 and R 22. Chest clear with no edema and normal cardiac exam.

WBC = 18,000, Hct = 36. BUN = 72, Cr = 2.4 (baseline 1.8). CXR Clear.
A Case, Part 2

Admitted with presumptive diagnosis of community acquired pneumonia. After 4h in the ER he is transferred to the floor.

He receives 1L of NS in the ER; no antibiotics. When his daughter and son in law (also a physician) reached the floor, Vancomycin was begun and volume resuscitation initiated. CXR the next day revealed florid lobar pneumonia.

In hospital for 6 days. His Cr peaked at 4.8 and never recovered below 3.0. Despite meticulous renal care following this admission his renal function deteriorated and he began dialysis 4 years later. He is dialyzed at home and day trades while on the machine.
A Case, Part 3

Community Acquired Pneumonia requires prompt antibiotic therapy and restoration of adequate perfusion of vital organs.

Delay in initiation of both likely prolonged his hospitalization and led to acceleration of his renal failure.

How could this happen?
1. No process for calling out and fixing errors like this.
2. No reliable process for assuring that all patients with sepsis receive prompt antibiotics and restoration of BP.
3. Inadequate and defensive response from clinicians and leaders makes it unclear that a similar error will not occur in future.
Clinical Goals

To provide the kind of care we would each want our family members to receive:

- Quality
- Access
- Dignity
- Compassion
How to improve the **performance of medicine**

Attitudinal barriers to Engagement in Quality Improvement

Autonomy vs Standardization

“These things happen.”

**Owning the QI Agenda in the Department of Medicine**
How to improve the performance of medicine

Attitudinal barriers to Engagement in Quality Improvement

**Autonomy vs Standardization**

“These things happen.”

**Owning** the QI Agenda in the Department of Medicine
The craft of medicine

An individual physician
- placing his/her patient's health care needs before any other end or goal,
- drawing on extensive clinical knowledge gained through formal education and experience

Can craft
- a unique diagnostic and treatment regimen customized for that particular patient.

Medicine's promise:
This approach will produce the best result possible for each patient.
Craft Model or Industrial Design?

The craft model fails to deliver reliable quality and results in variability, injury and high cost.

The craft model fails to integrate clinical care into the successful management of the hospital.

Can industrial design serve as a model for the future of the profession?
From Craft-Based to Profession-Based Practice

From *craft-based practice*

- *individual physicians, working alone* (housestaff ::= apprentices)
- handcraft a customized solution for each patient
- based on a core ethical commitment to the patient and
- vast personal knowledge gained from training and experience

To *profession-based practice*

- *groups of peers, treating similar patients in a shared setting*
- plan *coordinated care delivery processes* (e.g., standing order sets)
- which individual clinicians adapt to specific patient needs
  - early experience shows
    - *less expensive* (facility can staff, train, supply an organize to a single core process)
    - *less complex* (which means fewer mistakes and dropped handoffs, less conflict)
    - *better patient outcomes*
Why "profession-based" practice?

1. It produces better outcomes for our patients

2. It eliminates waste, reduces costs, and increases available resources for patient care

3. It puts the caring professions back in control of care delivery

4. It is the foundation for ongoing improvement in care.
How to improve the **performance of medicine**

Attitudinal barriers to Engagement in Quality Improvement

Autonomy vs Standardization

“**These things happen.**”

Specific Examples: How a Department of Medicine and a Hospital can partner in CQI
“These things happen, because every time these things happen, somebody says, ‘These things happen,’ and that’s why these things happen!”
Department of Medicine: Owning Quality is a Team Endeavor

Peer Review Processes: Detect areas for Improvement

Department-wide Initiatives
  Inpatient
  Outpatient

Division-Based Dashboards

Development of Careers in Quality Improvement

Education in Quality Improvement
STOP
PLEASE CALL BEFORE ENTERING
### Non-DNR, Non-ICU Deathspers 1,000 Discharges

<table>
<thead>
<tr>
<th>Period</th>
<th>Odds of &quot;Complete Satisfaction&quot; with Decisionmaking</th>
<th>95% Confidence Interval</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Period</td>
<td>1.0</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Jul 2008 - Dec 2008</td>
<td>2.5</td>
<td>1.2 - 5.2</td>
<td>0.02</td>
</tr>
<tr>
<td>Jan 2009 - Jun 2009</td>
<td>3.3</td>
<td>1.7 - 6.6</td>
<td>0.0006</td>
</tr>
<tr>
<td>Jul 2009 - Dec 2009</td>
<td>3.6</td>
<td>1.9 - 7.0</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Jan 2010 - present</td>
<td>6.9</td>
<td>2.6 - 18.2</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Adjusted for survival status
Implementation and outcomes of the Multiple Urgent Sepsis Staging System

Proof of principle: The predisposition, infection, response, organ failure sepsis staging system

Michael D. Howell, MD, MPH; Daniel Talmor, MD, MPH; Philipp Schuetz, MD; Sabina Hunziker, MD; Alan E. Jones, MD; Nathan I. Shapiro, MD, MPH

Serum Lactate as a Predictor of Mortality in Emergency

DOI 10.1007/s00134-007-0680-5

Occult hypoperfusion and mortality in patients with suspected infection

Michael D. Howell
Michael Donnino
Peter Clardy
Daniel Talmor
Nathan I. Shapiro

Crit Care Med 2003 Vol. 31, No. 3
Most prestigious award in the country for person- and family-centered ICU care
Major national award. BIDMC was the only hospital in Boston... hospital in New England... major academic medical center in the country to receive it for prevention of both central line infections and ventilator-associated pneumonia.
MICU LOS: ↓ 25%

MICU Throughput: ↑ 77%

1,410 more MICU patients per year

MICU Mortality (in-hospital): ↓ 32%

For every 20 MICU patients, 1 fewer death
GRACE
global risk assessment & careplan for elders
### Assessment for Delirium

**R.A.S.S. (Richmond Agitation and Sedation Scale)**

- **7 a.m. - 3 p.m.**
  - Time: ________
  - (24 hour):
  - Initials: __________
- **3 p.m. - 11 p.m.**
  - Time: ________
  - (24 hour):
  - Initials: __________

**Test of Attention**

- Is patient able to perform:
  - Test of Attention: □ Yes □ No
  - Time (24 hour): ________
  - Initials: __________
- If Yes, please indicate test used:
  - Months of the year: ________
  - Days of the week: ________
  - Counting: ________

**R.A.S.S. (Richmond Agitation and Sedation Scale)**

- 4 = Comatose
- 3 = Very agitated: Pulls or removes tube(s) or catheter(s); aggressive
- 2 = Agitated: Frequent non-purposeful movements
- 1 = Restless: Ataxic but movements not aggressive, vigorous
- 0 = Alert and Calm
- -1 = Drowsy: Not fully alert, but has sustained awakening (eye opening / eye contact) to voice (greater than or equal to 10 seconds)
- -2 = Light sedation: Briefly awakened with eye contact to voice (less than 10 seconds)
- -3 = Moderate sedation: Movement or eye opening to voice (but no eye contact)
- -4 = Deep sedation: Movement or eye opening to physical stimulation
- -5 = Unarousable: No response to voice or physical stimulation

**Test of Attention**

1. Ask patient to state the months of the year backwards (e.g., December, November, October, September, January). If able, this becomes patient's daily Test of Attention. If unable,
2. Then ask to state days of week backwards (e.g., Sunday, Saturday, Friday, Thursday, Wednesday). If able, this becomes patient's daily Test of Attention. If unable,
3. Then ask the patient to count from 10 to 1 (10, 9, 8, 7, 6). If able, 10-1 becomes this patient's daily Test of Attention.

### Mobility Plan / Delirium Prevention Strategies

**Morning/Treatment Check:**

- R.N. discusses with M.D. the ongoing need for:
  1. IVF: □ Yes □ No □ N/A
  2. Foley: □ Yes □ No □ N/A
  3. Tens: □ Yes □ No □ N/A

**Patient needs:**

- Time (24 hour): ________
- Initials: __________

**Got patient out of bed to a chair two times per day:**

- Yes □ Patient unable □
- Time (24 hour): ________
- Initials: __________

**Ambulate patient in hallway two times per day:**

- Yes □ Patient unable □
- Time (24 hour): ________
- Initials: __________

**Normalizes sleep-wake cycle:**

- Minimize day-time napping

**Turn off lights and television (or to the CARE channel), limit routine vital signs checks and phlebotomy.

---

### INITIAL & SIGNATURE KEY

<table>
<thead>
<tr>
<th>Initials</th>
<th>Signature &amp; Credential</th>
<th>Print Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
To date, BIDMC has 1653 clinicians on OpenNotes and about 71,000 patients on PatientSite who are able to access/read OpenNotes.
Emotional harm from disrespect: the neglected preventable harm

Patient Engagement, Systems Science, and the Elimination of Preventable Harm

Beth Israel Deaconess Medical Center
Goal: To become a self-learning organization, where every employee makes small improvements every day.
Some Principles of Toyota Production

• **Kaizen:** Small improvements every day
• **Customer first:** Deliver exactly what the customer has ordered immediately.
• **Employees are the most valuable resource.**
• **Acceptable Defect Level = 0**
• **Margin = Selling Price – Cost**
• **Gemba:** Go and see for yourself.
• **5 Wastes:** Overproduction, storage, stress, movement and waiting
Department of Medicine: Owning Quality

Peer Review Processes: Detect areas for Improvement

Department-wide Initiatives
  Inpatient
  Outpatient

Division-Based Dashboards

Development of Careers in Quality Improvement

Education in Quality Improvement
Representative Stories

Mark Aronson  
Associate Chair for QI

Ken Sands  
Preventable Harm

Michael Howell  
ICU safety (Sepsis, Triggers, VAP, Lines)

Julius Yang  
Overall systems; avoiding readmits

Anjala Tess  
Novel QI curriculum

Chris Smith  
Standardized Training for Procedures

Sharon Wright  
Preventing nosocomial infections

Alex Carbo  
Detection of Events

Hans Kim  
QI General Medicine

David Feinbloom  
Systems to Avoid Medication-Related Errors

Melissa Mattison  
GRACE Program: Elder Safety in Hospital/ECHO

Daniel Leffler  
GI QI

Rachel Baden  
ECHO Hepatitis C

Shani Herzig  
Avoiding adverse drug effects

Brad Crotty/Arash Mostaghimi  
Housestaff Wiki

Kelly Graham  
Reliable Signouts

Lisa Fleming  
Smart Sheets for CHF Management

Mary Lasalvia  
Outpatient Parenteral Antibiotic Therapy
Training in Quality Improvement

Medical Students:
  Didactic sessions (M and M, Lectures, Integrated Curriculum)

Residents:
  Didactic sessions
  Education Innovation Project
    Geographically Based Firms with Dashboards
    Procedure Service
    Stoneman Elective
    Projects: Handoffs, Work Rounds, Ambulatory ICU

Fellows:
  Didactic sessions
  Division-Specific Quality Initiatives
Projects Developed by Residents and Fellows

Housestaff Wiki
Standardized Sign out
CHF Smartsheets
Open Notes for Resident Practice
Outpatient Antibiotic Therapy Clinic
Right Test Ordering in Radiology
• Winner of 2013 American Hospital Association-McKesson Quest for Quality Prize
  – Awarded to one hospital annually to honor leadership and innovation in quality improvement and safety. (We came in second in 2010).