CLINICAL QI AND PATIENT SAFETY IN HOSPITAL MEDICINE

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1. Gain understanding of the role of QI and patient safety in hospital medicine
2. Describe how researchers and clinicians can partner to enhance the impact of their respective work
“essentially, all models are wrong, but some are useful”

George E.P. Box (1919-2013)
University of Wisconsin
Translational Research (3 phase model)

Intersection: Research and QI

PRACTICE
Clinical Practice
- Delivery of Recommended Care to the Right Patient at the Right Time
- Identification of New Clinical Questions and Gaps in Care

T2
Guideline Development
Meta-analyses
Systematic Reviews

Practice-Based Research
- Phase 3 and 4 Clinical Trials
- Observational Studies
- Survey Research

T2 Translation to Patients

T3
Dissemination Research
Implementation Research

T3 Translation to Practice
The Bridge Between QI and Health Services Research (HSR)

A continuum in which to work and be successful. Each end needs the other and all the support in between.

**QI**

"Get it done by Tuesday"

**HSR**

"Write the next 5 year grant"
STANDARDIZATION Enhances Our Ability To Recognize DIVERSITY.

DIVERSITY Provides the Opportunity to Identify Problems with the STANDARD

STANDARDIZATION and DIVERSITY Complement and Strengthen Each Other.

Indeed, They Create Each Other.

Terry Clemmer MD, LDS Hospital, Salt Lake City, 1997
“Improving our work is our work”
Paul Batalden

Research  QI
Tour de Topics

- **Prologue:**
  - Hospital Readmission Rates and Length of Stay

- **Stages:**
  - Technology to Improve Inpatient Communication
  - Colorectal Cancer Screening
  - Antibiotic Stewardship and *C. difficile* Infection
  - Telehealth Collaborative Care: Rural HIV Care
  - Geographic Variation in Prescribing Quality
  - QI to Improve Interdisciplinary Rounds

- **End**
Hospital Readmissions
As LOS has goes down, do readmissions go up, down, or stay the same?

Who is incentivized to have readmissions?

Is it a measure of Quality?

Conclusion: Veterans Affairs hospitals demonstrated simultaneous improvements in hospital LOS and readmissions over 14 years, suggesting that as LOS improved, hospital readmission did not increase. This is important because hospital readmission is being used as a quality indicator and may result in payment incentives.
VA 1997-2010: LOS Reduction Significant for All Conditions
## LOS Reduction Significant for All Conditions

### Adjusted LOS (Mean, days)

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>All Med Dx</th>
<th>CHF</th>
<th>COPD</th>
<th>AMI</th>
<th>CAP</th>
<th>GIH</th>
</tr>
</thead>
<tbody>
<tr>
<td>97-98</td>
<td>5.44</td>
<td>6.33</td>
<td>5.68</td>
<td>6.63</td>
<td>7.18</td>
<td>5.08</td>
</tr>
<tr>
<td>03-04</td>
<td>4.54</td>
<td>5.31</td>
<td>4.53</td>
<td>4.90</td>
<td>5.74</td>
<td>4.17</td>
</tr>
<tr>
<td>09-10</td>
<td>3.98</td>
<td>4.40</td>
<td>3.89</td>
<td>3.78</td>
<td>4.96</td>
<td>3.68</td>
</tr>
<tr>
<td>Change</td>
<td>-1.46</td>
<td>-1.93</td>
<td>-1.79</td>
<td>-2.85</td>
<td>-2.22</td>
<td>-1.40</td>
</tr>
</tbody>
</table>
VA 1997-2010: 30-Day Readmission Rates Reduction
## Significant Reductions in 30-Day Readmissions

### Adjusted Readmission Rates

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>All Med Dx</th>
<th>CHF</th>
<th>COPD</th>
<th>AMI</th>
<th>CAP</th>
<th>GIH</th>
</tr>
</thead>
<tbody>
<tr>
<td>97-98</td>
<td>16.5%</td>
<td>20.4%</td>
<td>17.9%</td>
<td>22.6%</td>
<td>14.7%</td>
<td>14.1%</td>
</tr>
<tr>
<td>03-04</td>
<td>15.0%</td>
<td>19.3%</td>
<td>15.5%</td>
<td>20.2%</td>
<td>13.7%</td>
<td>13.1%</td>
</tr>
<tr>
<td>09-10</td>
<td>13.8%</td>
<td>19.0%</td>
<td>14.6%</td>
<td>19.8%</td>
<td>13.8%</td>
<td>12.2%</td>
</tr>
<tr>
<td><strong>Change</strong></td>
<td><strong>-2.7%</strong></td>
<td><strong>-1.4%</strong></td>
<td><strong>-3.3%</strong></td>
<td><strong>-2.8%</strong></td>
<td><strong>-0.9%</strong></td>
<td><strong>-1.9%</strong></td>
</tr>
</tbody>
</table>

The table above shows the adjusted readmission rates for different diagnoses over three fiscal years: 97-98, 03-04, and 09-10. The rates are significantly reduced in 09-10 compared to 97-98, with changes ranging from -2.7% to -3.3%.
A Slight Trade-off: Association between LOS reduction and Readmissions

Risk adjusted decrease in readmission rates for hospital with 0%, 10%, 25% and 40% reduction in LOS
Mortality Trends over 14 years

- 30-day mortality decreased by 25% (6.4% to 4.8%)
- 90-day mortality decreased by 18% (11.5% to 9.4%)

Logistic regression analyses, adjusting for patient demographics and comorbidity and hospital random effects, found similar reductions (P<0.0001).
Translational T2: Observational Study

Methods: Secondary Administrative Data Analysis

Impact on QI: Efficiency (LOS) can be improved without sacrificing quality (readmissions)

Impact on Research: How many more readmission studies do we need?

Next thing we are doing: determine the optimal time interval for measuring readmissions for benchmarking and local improvement

Return
Colorectal Cancer Screening
Objective: test whether a home FIT kit mailed to veterans accompanied by educational materials results in improved CRC screening rates in an average risk, asymptomatic population with no recent record of CRC testing compared to two other groups:
- education materials only
- usual care
Study Design: RCT (mail only)

Figure 1 Sampling Flowchart.

Veterans ages 50-64 in Iowa City VA catchment area with at least 2 primary care visits in prior 13 months N=8,219

Excluded those with signs/symptoms warranting diagnostic testing or a history/condition warranting surveillance N=2,923 (36%)

Asymptomatic veterans at average risk for colorectal cancer N=5,296 (64%)

Excluded those who had been screened within recommended time periods N=1,322 (16%)

Veterans who appear to be overdue for screening according to VA administrative records N=3,974 (48%)

Randomized

FIT Group N=500

Education (Ed) Group N=499

Usual Care (UC) Group N=500
## Screening Rate at 6 Months

### Table 2

<table>
<thead>
<tr>
<th>Screening Type</th>
<th>FIT</th>
<th>Education</th>
<th>Usual Care</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% (n)</td>
<td>% (n)</td>
<td>% (n)</td>
<td></td>
</tr>
<tr>
<td>Full sample</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No screening performed</td>
<td>79% (397)</td>
<td>94% (471)</td>
<td>94% (472)</td>
<td></td>
</tr>
<tr>
<td>Fecal immunochemical test (FIT)</td>
<td>14% (71)</td>
<td>0% (0)</td>
<td>0% (0)</td>
<td></td>
</tr>
<tr>
<td>Colonoscopy</td>
<td>6% (30)</td>
<td>5% (27)</td>
<td>4% (21)</td>
<td></td>
</tr>
<tr>
<td>Guaiac FOBT (gFOBT)</td>
<td>0% (2)</td>
<td>0% (1)</td>
<td>1% (7)</td>
<td></td>
</tr>
<tr>
<td>Total screened (any method)</td>
<td>21% (103)</td>
<td>6% (28)</td>
<td>6% (28)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Eligible respondents only</td>
<td>8% (6)</td>
<td>98% (40)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>No screening performed</td>
<td>90% (64)</td>
<td>0% (0)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Fecal immunochemical test (FIT)</td>
<td>2% (1)</td>
<td>2% (2)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Colonoscopy</td>
<td>0% (0)</td>
<td>0% (0)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Guaiac FOBT (gFOBT)</td>
<td>92% (65)</td>
<td>2% (2)</td>
<td>-</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

*Screening was classified according to the first test performed in the 6-month follow-up period.*
61% Completed FIT: 12.5% Positive

Figure 2  FIT Group Screening Rates

FIT Group  
N = 500

Responders  
N = 105

Eligible & Completed FIT  
n = 64

Positive  
n = 8

Colonoscopy Completed  
n = 6

Colonoscopy Not Advised Due to Other Health Concerns  
n = 2

Eligible & Did Not Complete FIT  
n = 7

Negative  
n = 56

Non-Responders  
N = 395

Ineligible for FIT  
n = 34*

Potential Symptoms  
n = 15

Personal/Family History  
n = 19

Referred for colonoscopy
Conclusions

- **Low intensity intervention**: high screening rate compared to control groups
- **Overall response was low**:  
  - Mail-only program may not be sufficiently effective  
  - Low rate may be due to screening performed outside VA (>50%)
- **Top reasons for not having colonoscopy**:  
  - fear of pain/discomfort  
  - health care provider did not recommend it  
  - preference for at-home tests  
  - screening options were confusing
- **Top reason for not have FIT**:  
  - health care provider did not recommend it
- *Translational T3*: Dissemination/Implementation
- *Methods*: RCT
- *Impact on QI*: Home-based screening is acceptable, effective, and can overcome distance barriers (rural implications)
- *Impact on Research*: Still need to know the comparative effectiveness of FIT vs. colonoscopy (VA CSP study)
- *Next thing we are doing*: flow-mapping CRC screening in primary care and determining where to “fit” the FIT into care
  - Targeted mailing during CRC Awareness Month (March)
  - Use PCMH (PACT) model
  - 2-stage process to avoid sending excess tests
  - Willingness to repeat FIT annually (currently ~80%)

- Return
Antibiotic Stewardship and C. difficile
High Risk Antibiotics
- Clindamycin
- 3rd Generation Cephalosporins
- Fluoroquinolones
Antibiotic Stewardship Programs (ASPs):

- Policies that aim to restrict patient exposure to certain ‘high-risk’ antibiotics

Examples:
- Persuasive Stewardship
  - Education
  - Change in Guidelines
  - Post-prescription review and recommendations
- Restrictive Stewardship
  - Removal from pharmacy
  - Prior-approval requirement
## Results

<table>
<thead>
<tr>
<th>Author Year</th>
<th>Location</th>
<th>Study Design</th>
<th>Study Setting</th>
<th>Intervention</th>
<th>Total pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elligsen 2012</td>
<td>Canada</td>
<td>quasi-ITS</td>
<td>ICU/Critical care</td>
<td>post-prescription review and recommendation (persuasive)</td>
<td>4,697</td>
</tr>
<tr>
<td>Fowler 2007</td>
<td>UK</td>
<td>quasi-ITS</td>
<td>geriatric acute care</td>
<td>education and post-prescription review and recommendation (persuasive)</td>
<td>6,129</td>
</tr>
<tr>
<td>Frank 1997</td>
<td>USA</td>
<td>quasi-ITS</td>
<td>entire hospital</td>
<td>prior approval requirement (restrictive)</td>
<td>28,055</td>
</tr>
<tr>
<td>Gulihar 2009</td>
<td>UK</td>
<td>quasi-ITS, retro. case-control</td>
<td>geriatric surgery, hip fractures only</td>
<td>formulary restriction/ change in stocking (restrictive)</td>
<td>1,491</td>
</tr>
<tr>
<td>Jones 1997</td>
<td>UK</td>
<td>before-after</td>
<td>only chest infection patients included</td>
<td>“change in our antimicrobial guidelines to replace cephalosporins” (unclear)</td>
<td>826</td>
</tr>
<tr>
<td>Ludlam 1999</td>
<td>UK</td>
<td>before-after, retro. case-control</td>
<td>geriatric acute care</td>
<td>“antibiotic policy restricting the use of third-generation injectable cephalosporins” (unclear)</td>
<td>4,194</td>
</tr>
<tr>
<td>Malani 2013</td>
<td>USA</td>
<td>retro. cohort</td>
<td>entire hospital</td>
<td>prior approval requirement (restrictive)</td>
<td>716</td>
</tr>
<tr>
<td>Miller 2009</td>
<td>UK</td>
<td>before-after</td>
<td>ICU/Critical Care</td>
<td>“introduction of a restrictive antibiotic prescribing policy” (unclear)</td>
<td>2,132</td>
</tr>
<tr>
<td>O’Connor 2004</td>
<td>Ireland</td>
<td>before-after, retro. cohort</td>
<td>geriatric acute care</td>
<td>education and policy change (persuasive)</td>
<td>683</td>
</tr>
<tr>
<td>Price 2010</td>
<td>UK</td>
<td>quasi-ITS</td>
<td>entire hospital</td>
<td>formulary restriction/ change in stocking (restrictive)</td>
<td>104,418</td>
</tr>
<tr>
<td>Schön 2011</td>
<td>Sweden</td>
<td>before-after, point prevalence survey</td>
<td>entire hospital x 3</td>
<td>education, change in national guidelines (persuasive)</td>
<td>76,416</td>
</tr>
<tr>
<td>Starks 2008</td>
<td>UK</td>
<td>retro. case-control</td>
<td>Geriatric surgery, hip fractures only</td>
<td>“change in antibiotic prophylaxis” pre-operative protocol (unclear)</td>
<td>1,811</td>
</tr>
<tr>
<td>Stone 1998</td>
<td>UK</td>
<td>before-after</td>
<td>geriatric acute care</td>
<td>formulary restriction/ change in stocking (restrictive)</td>
<td>2,467</td>
</tr>
<tr>
<td>Talapaert 2011</td>
<td>UK</td>
<td>quasi-ITS</td>
<td>medical &amp; surgical wards only</td>
<td>education, formulary restriction/ change in stocking, and post-prescription review and recommendation (restrictive)</td>
<td>NR</td>
</tr>
<tr>
<td>Thomas 2002</td>
<td>Australia</td>
<td>before-after</td>
<td>entire hospital</td>
<td>formulary restriction/ change in stocking and prior approval requirement (restrictive)</td>
<td>112,000</td>
</tr>
</tbody>
</table>

**Total:** 442,193 patients
Results

Forest Plot

ASP introduction associated with a 51% decrease in *C. difficile* incidence
## Results

### Stratified Analysis - Intervention

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>No. of Studies</th>
<th>Pooled RR (95% CI)</th>
<th>Pooled effect p-value</th>
<th>I²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall</strong></td>
<td>15</td>
<td>0.49 (0.39, 0.63)</td>
<td>&lt;0.00001</td>
<td>76%</td>
</tr>
<tr>
<td><strong>Intervention</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persuasive</td>
<td>4</td>
<td>0.59 (0.31, 1.12)</td>
<td>0.10</td>
<td>25%</td>
</tr>
<tr>
<td>Restrictive</td>
<td>7</td>
<td>0.48 (0.40, 0.58)</td>
<td>&lt;0.00001</td>
<td>31%</td>
</tr>
<tr>
<td>Restrictive- entire hospitals</td>
<td>4</td>
<td>0.51 (0.44, 0.59)</td>
<td>&lt;0.00001</td>
<td>0%</td>
</tr>
<tr>
<td>Removal from Pharmacy</td>
<td>5</td>
<td>0.46 (0.37, 0.58)</td>
<td>&lt;0.00001</td>
<td>33%</td>
</tr>
<tr>
<td>Prior Approval</td>
<td>3</td>
<td>0.50 (0.36, 0.68)</td>
<td>&lt;0.0001</td>
<td>7%</td>
</tr>
<tr>
<td>Post-Rx Review.</td>
<td>3</td>
<td>0.41 (0.27, 0.62)</td>
<td>&lt;0.0001</td>
<td>17%</td>
</tr>
</tbody>
</table>
Translational T2: Translation to Patients

Methods: Meta-analysis

Impact on QI: Further supports the need for Antibiotic Stewardship Programs (ASP) in hospitals

Impact on Research: What elements of ASP are most effective for success

Next thing we are doing:
- Tracking our CDI rates (currently very low)
- Tracking our CD-testing rates (currently high)
- Hired a VISN-wide infection control physician
- Started an MD/PharmD Stewardship program
- Promote probiotics to prevent CDI/antibiotic associated diarrhea

Return
Rural Telehealth HIV Care
Background

- VA largest provider of HIV care in US (~24,000)
- 12-18% with HIV live in rural areas
- Travel burden to drive to HIV specialty clinic when closer clinic with telehealth capability
- Establish trusting relationships between specialty and primary clinic teams
- Create communities of practice around specific patient populations
Telehealth Collaborative Care

- CPRS
- Telephone

- Shared Registry
- “True Team”: self aware as team, defined roles, responsibilities, and communication processes
## Pre/Post Telehealth Collaborative Care for HIV

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pre-TCC (N=17)</th>
<th>Post-TCC (N=24)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HIV Quality Measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Retention in care</td>
<td>17</td>
<td>13 (76)</td>
<td>24</td>
</tr>
<tr>
<td>2. CD4 Measurement</td>
<td>17</td>
<td>14 (82)</td>
<td>24</td>
</tr>
<tr>
<td>3. HIV viremia control</td>
<td>15</td>
<td>15 (100)</td>
<td>24</td>
</tr>
<tr>
<td>4. Syphilis screening</td>
<td>17</td>
<td>6 (35)</td>
<td>24</td>
</tr>
<tr>
<td>5. HCV screening</td>
<td>17</td>
<td>17 (100)</td>
<td>24</td>
</tr>
<tr>
<td>6. HBV screening</td>
<td>17</td>
<td>13 (76)</td>
<td>24</td>
</tr>
<tr>
<td>7. Influenza vaccination</td>
<td>17</td>
<td>8 (47)</td>
<td>24</td>
</tr>
<tr>
<td>8. Pneumococcal vaccination</td>
<td>17</td>
<td>15 (88)</td>
<td>24</td>
</tr>
<tr>
<td>9. HBV vaccination</td>
<td>5</td>
<td>2 (40)</td>
<td>10</td>
</tr>
<tr>
<td><strong>Cardiovascular Risk Factor Measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Hypertension control</td>
<td>10</td>
<td>10 (100)</td>
<td>14</td>
</tr>
<tr>
<td>11. Glycemia control</td>
<td>4</td>
<td>3 (75)</td>
<td>5</td>
</tr>
<tr>
<td>12. Lipid monitoring</td>
<td>17</td>
<td>16 (94)</td>
<td>24</td>
</tr>
<tr>
<td>13. Tobacco cessation</td>
<td>17</td>
<td>5 (29)</td>
<td>24</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Alcohol screening</td>
<td>17</td>
<td>3 (18)</td>
<td>24</td>
</tr>
<tr>
<td>15. Depression screening</td>
<td>17</td>
<td>0 (0)</td>
<td>24</td>
</tr>
<tr>
<td>16. Very/completely satisfied with care</td>
<td>—</td>
<td>—</td>
<td>18</td>
</tr>
<tr>
<td>17. Travel time, minutes, median (IQR)</td>
<td>17</td>
<td>320 (180–594)</td>
<td>24</td>
</tr>
</tbody>
</table>

*Note: N eligible and N met are counts and percentages, respectively.*

*Table 3. Care Measure Results*
Qualitative Evaluation

- Stigma and privacy were not barriers to TCC implementation
- Access improved through convenience
  - Trade-off with care coordination at 2 sites
  - Still relied on telephone for questions
- High value placed on specialist care
  - Little interest in turning all care over to PCP (SCAN-ECHO model)
Research QI

- **Translational T3**: Translation to Practice
- **Methods**: Mixed Methods (qualitative + quantitative)
- **Impact on QI**: Investigator highly engaged in clinical operation and success of intervention
- **Impact on Research**: Are other models of telehealth acceptable to patients/providers for low prevalence conditions?

**Next thing we are doing:**
- Testing the Specialty Care Access Network-Extension for Community Healthcare Outcomes (SCAN-ECHO)
- Spreading model to other rural sites of care

**Return**
Geographic Variation in Rx Quality
Regional Differences in Prescribing Quality Among Elder Veterans and the Impact of Rural Residence

Brian C. Lund, PharmD;1,2,3 Mary E. Charlton, PhD;1 Michael A. Steinman, MD;4 & Peter J. Kaboli, MD

- Should Rx quality have geographic variation?
  - Rural vs. urban?
  - North vs. south?

- Is Rx quality a function of patient population or driven by providers and the system?
What is Rx Quality?

Table 1  Most Common Violations for Each Prescribing Quality Indicator

<table>
<thead>
<tr>
<th>Zhan Criteria, Drugs to Avoid</th>
<th>Therapeutic Duplication</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Oxybutynin</td>
<td>1. Antidepressants</td>
<td>3.4%</td>
</tr>
<tr>
<td>2. Cyclobenzaprine</td>
<td>2. Antiulcer medications</td>
<td>2.2%</td>
</tr>
<tr>
<td>3. Dipyridamole</td>
<td>3. Short-acting beta-agonists</td>
<td>2.2%</td>
</tr>
<tr>
<td>4. Amitriptyline</td>
<td>4. Opioid analgesics</td>
<td>2.0%</td>
</tr>
<tr>
<td>5. Propoxyphene</td>
<td>5. Sedative-hypnotics</td>
<td>1.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fick Criteria, Drugs to Avoid</th>
<th>Drug Interaction</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Doxazosin</td>
<td>1. Simvastatin-verapamil</td>
<td>3.8%</td>
</tr>
<tr>
<td>2. Ferrous sulfate &gt;325 mg/d</td>
<td>2. Simvastatin-amiodarone</td>
<td>2.9%</td>
</tr>
<tr>
<td>3. Short-acting benzodiazepines</td>
<td>3. Aspirin-warfarin</td>
<td>2.7%</td>
</tr>
<tr>
<td>4. Clonidine</td>
<td>4. Atenolol-valsartan</td>
<td>2.1%</td>
</tr>
<tr>
<td>5. Daily fluoxetine</td>
<td>5. Aspirin-ibuprofen</td>
<td>2.0%</td>
</tr>
</tbody>
</table>
### Table 2  Variation in Prescribing Quality Among Older Adult Veterans By Geographic Region

<table>
<thead>
<tr>
<th>Indicator</th>
<th>National N = 1,549,824</th>
<th>Regional Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 297,651 N (%)</td>
<td>Midwest N = 406,152 N (%)</td>
</tr>
<tr>
<td>Zhan criteria</td>
<td>277,148 (17.9%)</td>
<td>39,383 (13.2%)</td>
</tr>
<tr>
<td>Fick criteria</td>
<td>256,180 (16.5%)</td>
<td>39,479 (13.3%)</td>
</tr>
<tr>
<td>Therapeutic</td>
<td>99,672 (6.4%)</td>
<td>14,741 (5.0%)</td>
</tr>
<tr>
<td>Duplication</td>
<td>14,741 (5.0%)</td>
<td>11,049 (3.71%)</td>
</tr>
<tr>
<td>Drug-drug Interaction</td>
<td>11,049 (3.71%)</td>
<td>11,049 (3.71%)</td>
</tr>
</tbody>
</table>
## Rural vs. Urban

### Table 4 Regional Variation in Associations of Rural Residence and Prescribing Quality

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Northeast</th>
<th>Midwest</th>
<th>West</th>
<th>South</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zhan criteria</td>
<td>1.11</td>
<td>0.97</td>
<td>0.89</td>
<td>1.22</td>
</tr>
<tr>
<td></td>
<td>(1.09, 1.14)</td>
<td>(0.95, 0.99)</td>
<td>(0.87, 0.91)</td>
<td>(1.20, 1.23)</td>
</tr>
<tr>
<td>Fick criteria</td>
<td>1.02</td>
<td>0.99</td>
<td>0.96</td>
<td>1.09</td>
</tr>
<tr>
<td></td>
<td>(1.00, 1.04)</td>
<td>(0.97, 1.01)</td>
<td>(0.94, 0.98)</td>
<td>(1.07, 1.10)</td>
</tr>
<tr>
<td>Therapeutic</td>
<td>1.07</td>
<td>0.99</td>
<td>0.88</td>
<td>1.15</td>
</tr>
<tr>
<td>Duplication</td>
<td>1.12</td>
<td>1.01</td>
<td>1.17</td>
<td>1.12</td>
</tr>
<tr>
<td>Drug-drug</td>
<td>0.97</td>
<td>0.97</td>
<td>0.90</td>
<td>1.11</td>
</tr>
<tr>
<td>Interaction</td>
<td>(0.93, 1.01)</td>
<td>(0.94, 1.00)</td>
<td>(0.86, 0.94)</td>
<td>(1.08, 1.14)</td>
</tr>
</tbody>
</table>

* Odds-ratios (95% CI) for Rural versus Urban Residence
Potentially Inappropriate Prescribing in Elderly Rural Veterans: Regional Variation of Zhan Criteria

Western Region
- Rural: 17.8%
- Urban: 19.6%
- OR: 0.89 (0.87, 0.91)

Midwest Region
- Rural: 15.7%
- Urban: 16.1%
- OR: 0.97 (0.95, 0.98)

Northeast Region
- Rural: 14.2%
- Urban: 12.8%
- OR: 1.12 (1.10, 1.15)

Southern Region
- Rural: 23.0%
- Urban: 19.6%
- OR: 1.23 (1.21, 1.24)
Potentially Inappropriate Prescribing by HRR (Lund)
High-risk Drugs in Medicare

Stroke Belt

Stroke Death Rates, 2000-2006
Adults Ages 35+, by County

[Map showing stroke death rates across the United States, with varying shades indicating different rates.]

Age-Adjusted Average Annual Deaths per 100,000

35 - 96: 679
97 - 105: 624
106 - 114: 676
115 - 125: 815
126 - 198: 544
Insufficient Data: 3

Rates are spatially smoothed to enhance the stability of rates in counties with small populations.
ICD-10 codes for stroke: I00-I69
Data Source: National Vital Statistics System and the U.S. Census Bureau

[Logos for CDC and other agencies are present on the map.]
Obesity by State

- **35.1% and Higher**
- **30.1%-35%**
- **25.1%-30%**
- **20%-25%**
Smoking Rates by State

- 23–26%
- 19+–22%
- 16+–19%
- 13–16%
- 10–less than 13%
Percent Uninsured by State
Percent Uninsured by HRR

Radley and Schoen. NEJM 367:1, July 5, 2012
Antibiotic Spending by State
What is going on in the South?
What can we learn from Minnesota and Iowa?
Translational T2: Translation to Patients

Methods: Secondary Analysis of Administrative Data

Impact on QI: Influence how prescribing quality can be measured and reported to front-line providers

Impact on Research: Understand the limitations of administrative data and need for more granular investigation

Next thing we are doing:
- Cluster-randomized trial of providing prescribing quality data directly to pharmacists to impact patient selection in the Primary Care Medical Home (VA PACT)

Return
Access to Care
Access to VA Services

- 313M pop → ~21M Veterans → 8.2M Enrolled → 5.5M Patients
  - 21% live >60 min from 1st care
  - 42% live >90 min from acute care

- 9.5M ≥65 eligible for Medicare and VA
  - ~50% of Medicare eligible Veterans are “dual-users”

- “Dual-Eligible”: using both VA and non-VA healthcare.
  - 79% with other source of “insurance”
    - 55% Medicare Part A and 40% Medicare Part D
    - 26% Medigap
    - 12% Tricare for Life (DoD)
    - 10% Medicaid
    - 28% Private Insurance
Access: Definition


- New 21st Century Definition (Fortney, et al. JGIM)
  
  "Access to Care" represents the potential ease of having virtual or face-to-face interactions with a broad array of healthcare providers including clinicians, caregivers, peers, and computer applications.
  
  - **Actual**: represents those directly-observable and objectively measurable dimensions of access.
  
  - **Perceived**: represents those self-reported and subjective dimensions of access.
New Framework/Model for Access

- Set of specific dimensions that characterize the fit between the patient and the healthcare system.
- Perceived and Actual Access
- Dimensions of access:
  - Geographical
  - Temporal
  - Financial
  - Cultural
  - Digital
Veteran Perceptions of Care

Perceived Access to Care
- **Geographical**
  - Ease of travel
- **Temporal**
  - Time convenience
- **Financial**
  - Eligibility complexity
  - Affordability
- **Cultural**
  - Understandability
  - Trust
  - Self Stigma
- **Digital**
  - Connectivity opportunities
  - Usability and privacy

Perceived Need for Care
- **Symptom burden**
- **Susceptibility**
- **Stoicism**
- **Treatment efficacy**
- **Self efficacy**

Engagement
- **Face-to-face**
  - Patient-to-provider encounters
  - Patient-to-caregiver encounters
  - Peer-to-peer support
- **Digital**
  - Patient-to-provider communication
  - Patient-to-caregiver communication
  - Peer-to-peer support
  - Use of computer applications

Quality
- **Technical**
- **Interpersonal**

Satisfaction
- **Access to care**
- **Quality of care**
- **Outcomes of care**

Outcomes
- **Symptoms**
- **Side effects**
- **Functioning**
- **Quality of life**

Community Attributes

Veteran Characteristics

Actual Access to Care
- **Geographical**
  - Travel distance/time
- **Temporal**
  - Time to next appointment
  - Waiting time in reception
- **Financial**
  - Eligibility
  - Out of pocket costs
- **Cultural**
  - Language match
  - Provider stigma
  - Public stigma
- **Digital**
  - Connectivity

VA Healthcare System Structure

VA Provider Characteristics

Fortney, Burgess, Bosworth, Booth, Kaboli. *JGIM*, Oct 2011
Technology to Improve Inpatient Communication
“The simple narrative of our age – that computers improve the performance of every industry they touch – turns out to have been magical thinking when it comes to healthcare. In our sliver of the world, we’re learning, computers make some things better, some things worse, and they change everything.” Robert Wachter, MD – *The Digital Doctor* (04/2015)
QI Study Aim

- To improve nurse-physician communication by implementing a quality improvement (QI) project.
Significant Survey Results

- MDs were more likely to agree that communication with RNs prior to, during and after rounds was occurring
  - 50% of MDs believed they alert an RN when rounds are occurring, compared to only 3% of RNs
  - 65% of MDs believed that communication between team members is adequate; only 16% of RNs agree
- MDs (100%) and RNs (92%) agreed that bedside RN-MD rounds are not a part of hospital’s culture
- 68% of MDs believed RNs were hard to locate compared to 26% of RNs
Rate of MD-RN Rounding Observed

Pilot start date
Observations

- Tech limitations (e.g., availability, battery, voice recognition) were inconvenient.
- Rates of RN-MD bedside rounds increased marginally, but perceptions improved substantially.
- Technology didn’t solve a basic problem with communication and culture.
Aligning complex processes and electronic health record templates: a quality improvement intervention on inpatient interdisciplinary rounds

Hilary J. Mosher¹,²,⁵*, Daniel T. Lose¹,³, Russell Leslie¹, Priyadarshini Pennathur⁴ and Peter J. Kaboli¹,²
Interdisciplinary Rounding context

- Transient multidisciplinary teams (i.e. AAMC)
- Conflicting schedules/ workload
  - Peak time demands vary across discipline
- Heterogeneous patient populations
  - Medically complex patients
  - Post hospitalization placement/rehabilitation
  - Social needs
Care Coordination Strategies

- Inpatient Care Navigators
- Structured Interdisciplinary Round Checklists (SIDR)
- Structured Interdisciplinary Bedside Rounding (SIBR)
- Asynchronous communication
  - White boards, EMR tools
Our observations

Box and Whisker Plot:
Observed Time Variability (in seconds) of Patient Discussions During Interdisciplinary Care Rounds
What is the best way to structure and document IDR to support consistent high quality?

**Structured Inter-Disciplinary Rounds (SIDR)**

**Communication Tool**

**OVERALL PLAN OF CARE**
- Diagnosis?
- Patient’s chief concern?
- Tests today?
- Procedures today?
- Medication changes today?
- Medication Issues?
- Consulting services?
- Expected Discharge date?

**DISCHARGE PLANS**
- Telemetry needed?
- Discharge needs?
  - Placement?
  - Home health needs?
  - Transportation?

**PATIENT SAFETY**
- On VTE prophylaxis?
- Can central lines be discontinued (including PICCs)?
- Can Foley catheter bed is continued?
- Can we reduce fall risk?
- Can we reduce pressure ulcer risk?

---

For complicated processes involving teams, algorithmic or heuristic checklists?

Heuristics provide general instructions for how to arrive at a stated goal, but do not prescribe sequential or contingent steps, as algorithmic scripts or checklists do.

Heuristic scripts provide greater space for cognitive processing, whereas an algorithmic script is followed in stepwise fashion for each patient, by each practitioner, each time.
The decision to use an algorithmic or heuristic approaches depends on the process, context, and desired outcome.

<table>
<thead>
<tr>
<th>Algorithmic</th>
<th>Heuristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>- any operator</td>
<td>- assume skilled operator</td>
</tr>
<tr>
<td>- exact instructions</td>
<td>- general instructions</td>
</tr>
<tr>
<td>- single fixed outcome</td>
<td>- multiple and variable (subjective) acceptable outcomes</td>
</tr>
</tbody>
</table>

Example:
*Algorithmic*
Central line placed in aseptic manner in the correct vessel in the correct patient

*Heuristic*
Patient is discharged in timely fashion to an appropriate location with optimal support and follow-up
ISDA Framework

The ISDA format is similar to a SOAP presentation for medical rounds.

1. **Identify**  
   the patient’s name, primary care provider, hospital day, main diagnosis or medical issue, anticipated discharge date and discharge disposition.

2. **Summarize**  
   the goals of care and treatment plan.

3. **Discuss**  
   the main interdisciplinary issues in daily care and discharge planning.

4. **Ask**  
   what was missed? And if are there orders to place?
How many checkboxes does it take to document interdisciplinary care?
Short, heuristic instructions aligned with note template to encourage shared process
The intervention sustainably increased the proportion of IDR notes completed daily.
Balancing measures were unchanged by the intervention.
We packaged our work into a Toolkit

- Description of intervention
- Physician Pocket Card
- Information Sheet
- Inpatient Team Poster
- 6 minute Video
- Screenshots
Interdisciplinary Rounds

“Working together can make this time the most valuable 15 minutes of your day”

Team Schedule: Monday -Friday

<table>
<thead>
<tr>
<th>Blue</th>
<th>Red</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 am</td>
<td>11:45 am</td>
<td>12:00 pm</td>
</tr>
</tbody>
</table>

1. **Identify:**
   a. Patient’s name, PCP, and hospital day
   b. Main diagnosis or medical issue
   c. Anticipated discharge date
   d. Anticipated discharge disposition

2. **Summarize:** goals of care and treatment plan

3. **Discuss:** interdisciplinary issues in daily care and discharge planning

4. **Ask:** what was missed and orders to place?

Common Interdisciplinary Issues

**Early Hospitalization**
- Physical Function
- Mental Function
- Nutrition and Swallowing
- Palliative Care/Advanced Care Planning

**Daily Care & Preparing for Discharge**
- Lines and Tubes
- Medication reconciliation
- Poly-Pharmacy
- Non-Formulary Medications

**Planning for On Time Departure**
- Transportation (DAV, ambulance, etc)
- Placement
- Medical Supplies
- Home Infusion (e.g. antibiotics)
- Home Support (homemaker, skilled nursing)
- Home Oxygen
- Outpatient Appointments
Video

Interdisciplinary Rounds
Achieving Excellence in Interprofessional Care

[Video Player]

If this video still will not play, click the download below.

Download Video: "MP4"

http://www.cadre.research.va.gov/Quality_Scholars.asp
Intersection: Research and QI

- Readmissions
- CRC Screening
- C. difficile
- Rx Quality
- HIV
- Telehealth

Clinical Practice:
- Delivery of Recommended Care to the Right Patient at the Right Time
- Identification of New Clinical Questions and Gaps in Care

Practice-Based Research:
- Guideline Development
- Meta-analyses
- Systematic Reviews
- Phase 3 and 4 Clinical Trials
- Observational Studies
- Survey Research

T2: Translation to Practice

T3: Dissemination Research
- Implementation Research

Translation to Patients
Researchers, front-line clinicians, and QI leaders need to work in teams to inform the work of each other.

Researchers benefit from being involved in QI and vice-versa.

Inter-professional and team-based approaches to research and QI can be more successful and rewarding.
Thank you