Radiology Metrics: Navigating a World of Metric Fixation

Samir B. Patel, MD, FACP
Value Management Program Director
Radiology, Inc.
Beacon Health System Board of Directors

Sheila S. Witous, MBA, CPA, CGMA
Chief Administrative Officer
Radiology, Inc.
Disclosures

• No financial disclosures
Objectives

• Define metric fixation and understand its implications
• Recognize examples of radiology metric fixation
• Propose solutions to succeed in a world of healthcare metrics fixation
Learning Objectives

Define metric fixation and understand its implications.

Recognize examples of radiology metric fixation.

Propose solutions to succeed in a world of healthcare metric fixation.
U.S. Healthcare Spending: % of GDP

World Healthcare Spending as % of GDP

Health Care Spending as % of GDP
1995-2014

USA

Sweden
Switzerland
France
Germany
Netherlands
Canada
Japan
Australia
Italy
Great Britain

World Bank
Numeric indicators to manage and monitor performance

Key performance indicators of status and function

Typically process or outcomes

May or may not measure value

Radiographics 2015; 35:866-878
Metrics

Help make sense of environment, results, objectives

Proxies for what you care about

Induce some level of behavior

Inherently imperfect at some level

Arguments Against Metrics

- Creaming ("cherry-picking")
- Goal Diversion - Short Termism - Purpose Deviation
- Data Distortion or Omission
- Cheating

The Tyranny of Metrics. 2018. Jerry Z. Muller
Metrics

Can give appearance of transparency & objectivity (readily understood)

As a measure of accountability is **attractive in cultures with low social trust** (American culture since 1960s)

Seen as a guarantee of objectivity and a replacement for intimate knowledge & personal trust

The Tyranny of Metrics. 2018. Jerry Z. Muller
Metric Fixation Beliefs

1. Numeric measurement (metrics) can substitute for experience & personal judgement
2. Making metrics public (transparent) assures institutions carrying out their purpose (accountability)
3. Best way to motivate is by attaching rewards & penalties to measured performance
   • Rankings (reputational)
   • Pay-for-performance (monetary)

The Tyranny of Metrics. 2018. Jerry Z. Muller
Rating the Raters

- **B** • US News & World Report
- **C** • CMS Hospital Quality Star Ratings
- **C-** • Leapfrog Safety Score
- **D+** • Healthgrades Top Hospitals

Rating the Raters: An Evaluation of Publicly Reported Hospital Quality Rating Systems. NEJM Catalyst. August 14, 2019
Comparison of Services Available in 5-Star and Non–5-Star Patient Experience Hospitals

<table>
<thead>
<tr>
<th>Services</th>
<th>% 5-Star Hospitals with Service</th>
<th>% Non-5-Star Hospitals with Service</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED</td>
<td>77.3%</td>
<td>95.3%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>ICU</td>
<td>42.0%</td>
<td>90.6%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Interventional Cardiac Cath</td>
<td>7.6%</td>
<td>53.6%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Neurology</td>
<td>23.5%</td>
<td>70.2%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Siddiqui, et al. JAMA Internal Medicine 2019
# Consumer Preferences and Online Comparison Tools Used to Select a Surgeon

## Respondent’s Ranking of Preferences for Selection

<table>
<thead>
<tr>
<th>Preference</th>
<th>Response % (n=24,953)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepts my insurance</td>
<td>50.9%</td>
</tr>
<tr>
<td>Referral from PCP</td>
<td>43.6%</td>
</tr>
<tr>
<td>Physician reputation</td>
<td>38.0%</td>
</tr>
<tr>
<td>Hospital reputation</td>
<td>27.9%</td>
</tr>
<tr>
<td>Office location</td>
<td>17.3%</td>
</tr>
<tr>
<td>Family/friend recommendation</td>
<td>9.7%</td>
</tr>
<tr>
<td>Rating website</td>
<td>6.7%</td>
</tr>
<tr>
<td>None</td>
<td>11.7%</td>
</tr>
</tbody>
</table>

## Respondent’s Use of Online Physician Comparison Sites

<table>
<thead>
<tr>
<th>Preference</th>
<th>Response %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yelp.com</td>
<td>12.2%</td>
</tr>
<tr>
<td>Healthgrades.com</td>
<td>9.9%</td>
</tr>
<tr>
<td>Healthcare system, hospital, group practice</td>
<td>7.4%</td>
</tr>
<tr>
<td>Insurance plan</td>
<td>7.2%</td>
</tr>
<tr>
<td>Angie’s list</td>
<td>5.5%</td>
</tr>
<tr>
<td>Consumer Reports</td>
<td>5.5%</td>
</tr>
<tr>
<td>US News &amp; World Report</td>
<td>4.7%</td>
</tr>
<tr>
<td>Medicare (Physician Compare)</td>
<td>4.2%</td>
</tr>
<tr>
<td>None</td>
<td>67.6%</td>
</tr>
</tbody>
</table>
MACRA/MIPS (Quality Payment Program)-Year 1 (2017)

Payment Adjustment-% Tax ID(TIN)/NPI

- 5.0% Negative
- 2.0% Neutral
- 22.0% Positive
- 71.0% Positive + Excep. Bonus

93% Eligible Clinicians Received Positive Payment Adjustment

Maximum Payment Adjustment

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>-4.00%</td>
</tr>
<tr>
<td>Neutral</td>
<td>0.00%</td>
</tr>
<tr>
<td>Positive</td>
<td>+0.20%</td>
</tr>
<tr>
<td>Positive + Excep. Bonus</td>
<td>+1.88%</td>
</tr>
</tbody>
</table>

CMS 2017 QPP Reporting Experience

2020 ACR-RBMA Practice Leaders Forum
## MACRA/MIPS (Quality Payment Program) - Year 2 vs. Year 1

<table>
<thead>
<tr>
<th>Performance Year</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation Rate</td>
<td>95%</td>
<td>98%</td>
</tr>
<tr>
<td>Eligible Clinicians Receiving Bonus</td>
<td>93%</td>
<td>97%</td>
</tr>
<tr>
<td>Maximum Positive Payment Adjustment</td>
<td>+1.88%</td>
<td>~+1.68%</td>
</tr>
</tbody>
</table>
Filters

https://www.researchgate.net/figure/Filters-in-decision-making-based-on-Ansoff-1984_fig3_268744262
All metrics are filters (ignore some information)

~70,000

~10,000

~250/550
Performance Measures

• **IMPORTANCE**
  • Relevance
  • Health importance (prevalence, incidence, morbidity, mortality)
  • Applicability to measure equitable distribution (disparities)
  • Potential for improvement (evidence of need, poor quality, variation)
  • Susceptibility to being influenced (under control to improve)

• **SCIENTIFIC SOUNDNESS: CLINICAL LOGIC**
  • Explicitness of evidence
  • Strength of evidence

• **SCIENTIFIC SOUNDNESS: MEASURE PROPERTIES**
  • Reliability (reproducible)
  • Validity (measures what it is supposed to measure)
  • Allowance for patient factors (stratification)
  • Comprehensible (understandable)

• **FEASIBILITY**
  • Explicit numerator/denominator specification
  • Data availability (accessible, cost-effective)

Source: Agency for Healthcare Research and Quality (AHRQ)’s National Quality Measures Clearinghouse (NQMC) 7/13/2017
Performance Measures

Anatomy of a Measure

Measure = Eligible Population - Applied Exceptions

Unit of Measurement + Clinical Action / Outcome of Interest

Numerator

Denominator

Exceptions are taken out of the denominator before the measure is calculated
Performance Measures

- Initial Population
- Denominator
- Denominator Exclusions
- Numerator
- Denominator Exceptions

2020 ACR-RBMA Practice Leaders Forum
Healthcare Metrics

1. Societal and cultural factors outside the medical system
   Potential for lower quality for conditions not part of program

Financial incentives may not work on knowledge workers like service workers
   Making nonprofit organizations more businesslike

The Tyranny of Metrics. 2018. Jerry Z. Muller
Metric Fixation-Incentive Dilemma

- monetary rewards can have unintended consequences, e.g. gaming
  - **Cobra Effect** (Am Econ J 2018;10:298-325)

- extrinsic motivators can inadvertently replace intrinsic motivators leading to decreased motivation
  - **Blood Donor’s Dilemma** (J Econ Perspect 2011;25:191-210)
Metric Fixation-Incentive Dilemma

• “Workplace satisfaction is driven more by intrinsic motivators, such as purpose, mastery, and autonomy, than extrinsic motivators, such as salary and financial incentives.”

• “The widespread use of extrinsic motivators, such as financial incentives, may replace the more effective intrinsic motivators over time, creating a radiology workforce that is now dependent on, but not satisfied by, salary and financial incentives.”

Radiologist Productivity

- Frequently wRVU and procedure based
- May be tied to compensation
- Usually not inclusive
Radiology Value-Added Matrix

Quality
- Accreditation Requirement
- Adverse Event Analysis
- Conference
- Peer Learning
- Physician Quality Reporting
- Protocol Management
- Radiation Dose Management
- Radiology-Pathology Correlation
- Structured Reporting
- Technologist & Staff Engagement

Service
- Committee
- Community Service
- Critical Test Result Management
- Customer Experience
- Marketing
- Patient Supervision & Monitoring
- Recruiting
- Referring Provider Communication
- Subspecialization
- Turnaround Time

Resource Management
- Outcomes Measurement
- Physician Well-Being
- Radiologist Scheduling
- Revenue Cycle Management
- Utilization Management
- Utilization Review
- Vendor Interaction

Professional Development
- Executive Meeting
- Leadership
- Leadership CME
- National/State Radiology
- Practice Improvement Project (e.g., LEAN A3)
- Presentation
- Publication
- Research
- Teaching

Copyright-Radiology, Inc. (Mishawaka, IN) 2018
developed in cooperation with Samir B. Patel, MD, FACR
Radiologist Productivity

\[ VAU = \text{Value-Added Units} = \text{value-added hours} \times \text{wRVU/hour} \]
Radiologist Productivity

76.9%

23.1%
Radiologist Productivity

**wRVU (Highest → Lowest)**

A
B
C
D
E
F
G
H
I
J

**wRVU + VAU (Highest → Lowest)**

E
A
B
C
J
H
L
I
G
D

- 100% change in ranking
- 60% dropped in ranking
- 1 person dropped out of top 10
- 1 person entered top 10
Radiology, Inc. 2018 Value Management Program Annual Report

Mission Statement
Radiology, Inc. is committed to providing outstanding, innovative and appropriate patient care. We strive to provide exceptional value to our patients, referring physicians and hospital partners by providing unparalleled radiology, nuclear medicine and interventional radiology services, and physician leadership throughout Northern Illinois.

Vision
To provide value-added medical imaging

Population Health:
- 173,655 unique patients

>17,500 hours

Radiology Value-Added Matrix

Quality
- Accreditation Requirement
- Adverse Event Analysis
- Conference
- Peer Learning
- Physician Quality Reporting
- Protocol Management
- Radiation Dose Management
- Radiology-Pathology Correlation
- Structured Reporting
- Technologist & Staff Engagement

Service
- Committee
- Community Service
- Critical Test Result Management
- Customer Experience
- Marketing
- Patient Supervision & Monitoring
- Recruiting
- Referring Provider Communication
- Subspecialization
- Turnaround Time

Resource Management
- Outcomes Measurement
- Physician Well-Being
- Radiologist Scheduling
- Revenue Cycle Management
- Utilization Management
- Utilization Review
- Vendor Interaction

Professional Development
- Executive Meeting
- Leadership
- Leadership CME
- National CME
- Racquetball
- Reflections (LEAD A3)
- Presentation
- Research
- Teaching

Copyright Radiology, Inc. Chicago, IL. 2018. Developed in cooperation with Samir B. Patel, MD, FACP.
Radiation Dose

• Non-MIPS Measure ACRad 34
  • ACR Dose Index Registry (Qualified Clinical Data Registry)
  • Weighted average
  • CT Abdomen-Pelvis with contrast, CT Chest without contrast, and CT Head/Brain exams without contrast
  • Dose Length Product (DLP) is at or below the size-specific diagnostic reference level (DRL).
  • “A CT study should use as little radiation as possible, while still meeting the image quality needs of the exam.”
Radiation Dose & Image Quality

Dose (CTDi): 2.83
Dose (DLP): 96
MPA HU: 282
MPA Noise: 60
MPA SNR: 4.7

Dose (CTDi): 13.92
Dose (DLP): 440
MPA HU: 346
MPA Noise: 11
MPA SNR: 31.5
Turnaround Time

• Time taken to complete a process or fulfill a request
• Depends on activity start time and end time

Exam Request → Exam Completed → Exam Opened → Report Generated → Report Transcribed → Report Signed

Outcomes
Follow-Up & Feedback?
Turnaround Time

- Vacuum: Easy to measure and quantify
Financial Incentives to Improve Radiology Report Signature Time

- $4000 bonus semiannually
- Median signature time < 8 hours
- 80% of reports signed within 16 hours
- Gains sustained after discontinuation of financial incentive

Turnaround Time-Process Improvement (Ditching the Disc)

- Screening Mammography
- Outside comparisons
- Exam completion→reported

Mean TAT
- Mail: 8.53 days
- Cloud: 1.59 days
- 84%↓

Morgan et al. J Am Coll Radiol 2017;14:1560-1565
Surrogation

1. Tendency to mentally replace strategy with metrics
2. Harmful when strategy and metric poorly aligned
3. Greater harm if only one metric

Navigating a World of Metric Fixation-9 Solutions

- Strategy → Aligned Metrics
- Use Multiple Metrics
- Involve Multiple Stakeholders (Connection and Ownership)
- “Loosen link between metrics & incentives”
- Small Monetary Rewards
- Intrinsic Motivation
- "Wide Field-of-View"
- Understand Fraction Numerator(s) and Denominator(s)
- Gaming Scenario(s)
Summary

1. Metrics are Valuable
2. Recognize Metric Fixation and Avoid “Tyranny of Metrics”
3. Include Personal Judgement and Experience Coupled with Multiple Metrics
4. Remember Strategy, Purpose, Intrinsic Motivation