How to Develop an Effective Utilization Management Program

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My background

Former Life:
• Business School Professor
• Specialized in Operations Analysis, Analytics

Present Life:
• Director, Center for Effective Medical Testing
• Apply Analytics to Testing Problems
  • Cost-Effectiveness Analysis
  • Utilization
Learning Objectives

List key attributes of successful utilization programs.

Recognize situations where improvement metrics are counterproductive.

Explain how to identify strong utilization projects.

Describe several classes of interventions to improve utilization.

Identify common barriers to successful utilization management.
The REAL Objective:

– Make UM easier!
TAKE HOME MESSAGE:

– Utilization management is not difficult

– You already know how to do it
  • Continuous Improvement
  • Plan Do Study Act Cycle
The Opportunity

\[ Value = \frac{Health\ Outcomes + patient\ experience}{Cost} \]
How does the lab contribute value?

Plebani et al AJCP 2011; 136:829-833
Laboratory as Service Factory

Goals: Efficiency
Editorial

Is laboratory medicine a dying profession? Blessed are those who have not seen and yet have believed

Mario Plebani\textsuperscript{a, b}, \textsuperscript{b}, \textsuperscript{b}, \textsuperscript{b}, Giuseppe Lippi\textsuperscript{c}
Old Approach:

Samples → Laboratory Analytical Phase → Orders → Reports → Clinicians

New Approach:

Clinicians

Sampling & Transport

Test Order Process

Laboratory

Test Interpretation

Clinicians

EHR
Managing Utilization

• Organization
• Process
Utilization Improvement Process

- Target Identification
- Intervention Planning and Management
- Measurement
Utilization Improvement Process

1. Target Identification
2. Intervention Planning and Management
3. Measurement

PLAN

DO

STUDY
Utilization Improvement Process

- **Target Identification**
  - Idea generation
  - Project Selection

- **Intervention Planning and Management**
  - Implement Intervention

- **Measurement**
  - Assess Impact

- **PLAN**
  - Idea generation
  - Project Selection

- **DO**
  - Implement Intervention

- **STUDY**
  - Assess Impact

- **Data Collection**
  - Data Analysis
  - Domain Knowledge

- **Change Management**
  - Communication
  - Intervention Knowledge

- **Domain Knowledge**
  - Data Collection
  - Data Analysis
  - Domain Knowledge
KEY POINTS:

1. UM is nothing new – process improvement

2. Laboratory Medicine does not have a natural monopoly on utilization management

3. Utilization management is an opportunity for laboratory medicine
Generating ideas for improvement

- Review send out testing
- Obsolete tests
  - Common culprits
    - Helicobacter antibodies
    - Myelin basic protein for multiple sclerosis
    - Culture vs NAAT for microorganisms
    - HVA and MVA for pheochromocytoma
    - CKMB
More common culprits

• Thyroid testing
  – T3 uptake
  – Free T4 is preferred to Total T4
  – T3 testing should be relatively rare compared to T3 testing
  – Reverse T3

(See forthcoming CLSI document on utilization management)
More common culprits

• Thrombotic disorders
  – Functional vs Antigen testing for Proteins C and S
  – Lupus anticoagulant
    • Beta-2 glycoprotein IgA
    • Cardiolipin antibody IgA
Choosing wisely

- Recommendations for 20 different medical societies
- See summary in forthcoming CLSI document on Developing and Managing a Laboratory Test Utilization Program
Choosing wisely

• **American Academy of Family Physicians**
  - No routine screening for prostate cancer using PSA
  - No pap test for women younger than 21
  - Do not screen women younger than 30 with HPV testing

• **American Academy of Allergy, Asthma and Immunology**
  - No routine diagnostic tests for those with chronic urticaria
  - Do not perform unproven diagnostic tests such as IgG testing or battery of IgE tests for evaluation of allergy
Choosing wisely

- **American Society for Clinical Pathology**
  - Do not use bleeding time
  - Use troponin rather than CKMB for AMI
  - Avoid routine preoperative testing for low risk surgeries without a clinical indication
  - Low risk HPV tests
  - Population based screening for Vit-D deficiency
  - Only order vit K if patient has abnormal INR and does not respond to vit K therapy
Generating ideas for improvement

• Guideline adherence
  – Secondary tests second
    • PSA, Free PSA
    • Total Testosterone, Free Testosterone
    • TSH, Free T4

• Questionable cost-effectiveness
  – CVD tests
  – Genetic tests

• Testing Intervals
  – Once in a lifetime tests (germline genetic tests, HAV)
  – Tests with Guidelines (see Royal College)
Repeat Testing Guidelines

• **Royal College of Pathologists (UK)**
  – National Minimum Re-testing Interval Project
  – 50-60 suggested intervals
  – [https://www.rcpath.org/asset/BBCD0EB4-E250-4A09-80EC5E7139AB4FB8/](https://www.rcpath.org/asset/BBCD0EB4-E250-4A09-80EC5E7139AB4FB8/)

• **Orth M, et al.** Recommendations for the frequency of ordering laboratory testing. LaboratoriumsMedizin. 2014;38(5) in English


When guidelines are not available

- Benchmarking
- Test Yield
- Frequency profiles
Ratio of vitamin D to CBC

Overall Testing Intensity, Vit D/Blood Count
Ratio of 1,25 (OH)2 Vitamin D orders to 25-OH-Vitamin D
Practice Variation in Thyroid Testing

T4/TSH

T3/TSH

T3U/TSH

rT3/TSH

Test Selection Intensity Ratio, Test Volume/TSH Volume
Order patterns by hospital
Test Yield Comparison by Hospital
(HFE mutation)
Test Yield by Hospital

Activated Protein C

Prothrombin Mutation

Factor V Leiden

Percent Positive
Organizational Effect Across Three Tests
APC, PTGM, FVL
Decerebrate order patterns
(time interval between orders)
Testing on Autopilot

<table>
<thead>
<tr>
<th>Time period prior to discharge</th>
<th>Testing rate</th>
<th>Relative rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;24 hr</td>
<td>249 per hour</td>
<td>71%</td>
</tr>
<tr>
<td>24-48 hr</td>
<td>349 per hour</td>
<td>100%</td>
</tr>
</tbody>
</table>
Compare distribution of TAT of sendout tests to distribution of LOS

- TAT
- LOS

24 hrs 48 hrs Prob (Order + TAT < Discharge)
Picking projects

Results = Potential Impact x Manageability

**Potential Impact**
- Financial (cost x volume)
- Medical

**Manageability**
- Diffuse or concentrated problem
  - Planned intervention
- Specific problems (personnel, organizational)

**Sustainability**
- Education
- Hard stops, eliminating tests
Financial Impact

- **80/20 rule**
  - Most tests offer very little savings

<table>
<thead>
<tr>
<th>Strata</th>
<th>Number of Tests</th>
<th>% of Tests</th>
<th>% of Cost</th>
<th>% total testing volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>58</td>
<td>3%</td>
<td>60%</td>
<td>56%</td>
</tr>
<tr>
<td>2</td>
<td>190</td>
<td>9%</td>
<td>26%</td>
<td>29%</td>
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<td>3</td>
<td>359</td>
<td>17%</td>
<td>10%</td>
<td>11%</td>
</tr>
<tr>
<td>4</td>
<td>1463</td>
<td>71%</td>
<td>3%</td>
<td>4%</td>
</tr>
</tbody>
</table>
Financial Impact

- Charges
- Costs
- Marginal cost

10% reduction in volume → 2% reduction in cost
Manageability

• Engage key opinion leaders
  – Avoid voting (lowest common denominator)
Manageability

• Easy system-based interventions
  – Eliminate unordered tests
    • 1000 of 3500 never ordered in one year
    • 700 of 3500 ordered once in one year
  – Show “price” data
    • Feldman et al JAMA 2013 → 8.6% reduction

• Easy educational interventions
  – Feedback on relative volume, cost
Interventions

• System based (IT)
  – Cost info
  – Present last result
  – Restrictions (formularies)
  – Decision Support (links to algorithms)

• Education
  – Targeted (individuals, departments)
  – Broad based (residents)
    • Hidden curriculum favors zebra workups
Interventions

• Feedback
  – Individuals, Groups
  – Public vs private

• Rewards & Penalties

References on interventions:

• Kobewka et al. CCLM 2015;53(2):157-183

• Baird, G. The laboratory test utilization management toolbox. Biochemica Medica 2014; 24(2):223-224
Metrics

- Standards of proof
  - Before and after study sufficient for business
  - Academic publication will slow you down
Metrics - costing

• Charges
• Variable vs Fixed Costs
  – Most testing costs are fixed
  – What would you save if you sent the test out?

Good references:
  – Forthcoming CLSI document (chapter on metrics by Jason Baron and Kent Lewandrowski)
Should you measure?

A hospital is considering whether to implement a cost feedback program on their test menu. Previous studies have indicated that one might expect a 7% reduction in testing. Overall lab budget is $14 million/yr. Should the hospital conduct a study to measure the impact?

- Expected savings = $14,000,000 * 0.07 * 0.33 = $323,000 per year
- Estimated variable costs = 33%
- Cost feedback is unlikely to do harm. Not costly to implement.
- Cost of study:
  - Control arm = 50% of tests (no savings)
  - Interventional arm = 50% of tests ($160,000 savings)
- Bottom line: Pay $160,000 to see how big the savings were
Summary

• What we know
  – Process improvement methodology
  – Interventions
  – Targets with good metrics and guidelines (N ~50)

• What we don’t know
  – Need more guidelines, targets
  – How to evaluate downstream impact (patient outcomes)

• Keys:
  – Effective Project Management
  – Sharing Knowledge (don’t reinvent the wheel)