Laboratory Formularies: Improving Care, Reducing Costs

Brian Jackson, MD, MS
Associate Prof. of Pathology (Clinical), University of Utah
CMIO, ARUP Laboratories
• Mistake #3: Focus narrowly on procurement prices
  – Enormous variations in spending on supplies owing to clinician variation
  – “These findings suggest that many hospitals focus too narrowly on negotiating price and fail to examine how individual clinicians actually consume supplies. As a result, they miss potentially large opportunities to lower spending.”
Variation in Lab Utilization

Study of 18 academic medical centers

3 common inpatient diagnoses

- Acute MI
- Colorectal CA
- Hip fracture

Ranked into quintiles by resource use

Fisher ES et al. *Health Affairs* 7 Oct 2004

<table>
<thead>
<tr>
<th>Expense Category</th>
<th>Ratio of highest to lowest spenders</th>
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<tbody>
<tr>
<td>Laboratory testing</td>
<td>1.83</td>
</tr>
<tr>
<td>E&amp;M</td>
<td>1.65</td>
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<tr>
<td>Minor procedures</td>
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History of Formularies

• Original meaning = pharmacopoeia
• Hospital formulary = stocked drugs
  – Associated policies
  – Pharmacy & Therapeutics Committee
• Laboratory “formularies”
Formularies: Building Blocks

- Analytics
- Use of Clinical Evidence
- Governance
- Process
Governance of Test Ordering

Governance

Analytics

Use of Clinical Evidence

Process
Organizational Levels of Clinical Oversight

- Regulator
- Payor
- Health system
- Hospital
- Physician group/department
- Individual physician/provider

Resources ($)

Carrot/Stick power

Clinical nuance

Flexibility
Oversight of test utilization should be organized as close to the physician as practical
University of Rochester

- Laboratory Diagnostic Committee
  - Chaired by Chair of Medicine
  - 1st focus area: expensive sendouts for inpatients
  - 2nd focus area: unreimbursed sendouts for outpts

- Tiered formulary
  - Tier 1: Unrestricted
  - Tier 2: Faculty practice only
  - Tier 3: Not available
University of Michigan

• Chaired by Internist
• Multiple subspecialties represented
• Attention to cultural factors
  – Decision support, education, resource use

Warren JS, AJCP 2013;139:289-297
University of Iowa

• Involvement of non-physicians
  – Laboratory managers
  – Genetic counselors
• Hospitalist group benchmarking project
• Transplant group

Personal communication, Matt Krasowski
Process Considerations

- Governance
- Process
- Use of Clinical Evidence
- Analytics
Mechanics of Test Utilization Mgmt

Prior to Ordering Test

Processing the Test Order

Following the Test
• Limit and actively manage CPOE menu
• Limit and actively manage order sets
• Threshold for holding vs. sending
• Initial reject vs get more info
• Tap into governance committee members’ expertise
Targeted Test Rejections

• University of New Mexico
  – Vit D 1,25 orders automatically rejected as they arrive in the lab
  – Email to ordering providers: Call the lab to reinstate
  – Dramatic volume reduction

(Personal Communication, Dr. Michael Crossey)
Following the Test

Prior to Ordering Test

Processing the Test Order

• Feedback Loops
  – Monitoring
  – Updates to CPOE menu and order sets
  – Targeted education
Medical Impact on Patients

- Analytics
- Governance
- Process
- Use of Clinical Evidence
Do Restrictions Hurt Patients?
Do Restrictions Hurt Patients?

• **No.**
  
  – In some cases, too much testing can actually hurt patients
  
  – Properly designed restrictions can support evidence-based practice without interfering with appropriate care.
Horserace Handicappers

Take-home points

- Excess testing doesn’t add true information value
- Doctors can’t cognitively handle excess data
- Excess data causes overconfidence
Evidence Base for Lab Tests

• Generally available
  – Analytic validation
  – Plausible correlation of marker to disease state
  – Guidelines for routine tests for high-prevalence diseases

• Not available
  – Demonstration of improved clinical outcomes for most tests
  – Guidelines for most tests
Journal: *Evidence Based Medicine*

• October 2014 Table of Contents

  – Therapeutics/Prevention: 22 articles
  – Diagnosis: 3 articles (2 D-dimer, 1 ultrasound)
  – Quality Improvement: 2 articles
Measurement Criteria Must Be Credible (But Don’t Require Level 1 Evidence)
Metrics/Analytics

Analytics

Governance

Use of Clinical Evidence

Process
## Metrics for Diagnostics

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**Executive**

**Front line**
Patient Benefit (of a Test) per Case

• Outcomes
  – Generally not practical in this setting.

• Normative (Evidence Based Medicine)
  – Guidelines
  – Other clinical literature
  – Local expert opinion

• Non-normative/Descriptive
  – Variation
Diagnostic Testing Guidelines

Useful where available, but **extremely** incomplete
HPV: Tests on Patients <21 years old
Repeat Intervals Following Negative HPV Tests (2003-2013)
HPV: Median Repeat Interval Following Negative Result
Measuring Variation

• Available across full spectrum of tests and settings
• Non-judgmental (Validity harder to question)
• Decades of experience (esp. Dartmouth)
NMR Lipoprotein Profile

Volume Index (normalized by ARUP volume)
VAP Cholesterol
Volume Index (normalized by ARUP volume)
**Neopterin**

- Nonspecific marker of inflammation

- Of research interest, but not in routine clinical use for any one disease

- 770 orders to ARUP in recent 12 month period
  - 83% from a single client
  - 64% of those were placed by a single physician (=53% of ARUP’s national volume)
Measuring Variation

• Comparison group needs to be “reasonably” valid

• Can benchmark on multiple levels
  – Physician group
  – Hospital
  – Health system
  – Geographic region

• Use raw volumes, *not* CPT, charges or costs
Conclusions: Metrics for Laboratory Utilization

• Goal = Value
  – Both patient and system perspectives
• Financial metrics: Need to get the costs right
• Clinical metrics
  – Normative (guideline-based)
  – Non-normative (variation)
• Lab process metrics
The Future of Laboratory Medicine = Medicine