Improving Test Utilization: An Analysis of 5 Intervention Strategies

The Cleveland Clinic Experience

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Cleveland Clinic
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Healthcare Reimbursement

Length of Stay and Outpatient Testing.
- Incentive: Keep patient in-house.

DRG models (with and without complications) and Outpatient Testing.
- Incentive: Decrease LOS and increase outpatient visits.
  - Part II: Decrease HAIs and Re-admissions.

Value-Based Care Models/ Pay-for-Performance.
- Incentive: Keep patients healthy
  - Decrease hospitalizations and complications in chronic disease.
  - Take unnecessary costs out of the system
Take Unnecessary Costs Out of the System

How Not to Do It. By indiscriminate cutting

Why not?

Cutting necessary components in the healthcare delivery system will have an opposite effect than the intended goal (i.e. patient will not remain well).

How?

Physician/Laboratorian Leadership

- Engage those who know the most about testing
- Differentiating the necessary from the unnecessary. (Navigator)
- Provider-level communication.
  - Make it about best practice and optimal patient care.

Professional Society Leadership

- AACC: The Path to Better Test Utilization
- ASCP engagement in the ABIM Choosing Wisely Campaign
- CAP Test Utilization Working Group
Is Your Institution Interested?

Results from CAP Test Utilization Survey

- Strongly agree: 54%
- Agree: 38%
- Neutral: 5%
- Disagree: 2%
- Strongly disagree: 1%

Reasons for disagreeing (n=4):
- No motivation (25%)
- Test utilization not a role for pathologists (25%)
- Tried but resistance from clinicians so discontinued (50%)
What are You Doing About it?

Test Utilization Strategies

- Removing antiquated tests from menus: 83% currently use, 3% used in past but discontinued, 8% never used - not considering, 6% never used - considering using in future
- Canceling duplicate tests and/or tests ordered within certain time period: 78% currently use, 8% used in past but discontinued, 7% never used - not considering, 8% never used - considering using in future
- Actively reviewing & requiring pathologist and/or specialist approval for esoteric, expensive and/or other lab tests that are often misused: 59% currently use, 5% used in past but discontinued, 16% never used - not considering, 21% never used - considering using in future
- Providing guidelines or suggestions for appropriate testing on ordering menus, requisitions or info. systems: 56% currently use, 1% used in past but discontinued, 15% never used - not considering, 28% never used - considering using in future
- Restricting type of tests offered or displayed in test order menus, requisitions and/or info. systems: 52% currently use, 3% used in past but discontinued, 24% never used - not considering, 21% never used - considering using in future
- Utilizing diagnostic testing algorithms: 47% currently use, 2% used in past but discontinued, 22% never used - not considering, 29% never used - considering using in future
- Providing feedback to providers regarding their test utilization practices: 36% currently use, 1% used in past but discontinued, 24% never used - not considering, 39% never used - considering using in future
- Restricting certain tests to specialists only: 23% currently use, 5% used in past but discontinued, 38% never used - not considering, 34% never used - considering using in future
- Profiling and comparing providers based on volume and/or types of tests ordered: 17% currently use, 6% used in past but discontinued, 32% never used - not considering, 45% never used - considering using in future
- Providing cost info. on test ordering menus, requisitions or info. systems: 11% currently use, 5% used in past but discontinued, 46% never used - not considering, 41% never used - considering using in future

CAP Test Utilization Survey
Traditional Approaches to Test Utilization

Education with New Test Implementation
- Challenge: Communications that are read.
  - Are these read?

Re-Education
- Challenge:
  - New residents and fellows every year. = Did I already cover this?

Inappropriate orders intercepted upon accessioning.
- Doc-to-doc conversation.
  - Time consuming
  - May be confrontational –
    - (Good time for professionalism and communication skills).
- Specimen already drawn
What’s Changed?

- **Computerized Physician Order Entry (CPOE)**
  - The decision-maker is at the computer.

- **Clinical Decision Support Tools (CDST)**
  - There is an opportunity to unidirectionally interact with the decision-maker in real-time.
  - “Pop-ups” are hazardous.

- **Meaningful Use**
  - An obligation to improve practice with these new tools and systems.
  - Linked to reimbursement.

- **Volume to Value Based Payment System.**

- **Time for Systems-Based Changes, when possible.**
Building a Test Utilization Committee

- Physician / Laboratory Professional Led
- Leadership Support
- Open/ Transparent/ Multidisciplinary
- Active Support/ Partnership Information Technology
  - Clinical Decision Support Tools (CDST) and Computerized Physician Order Entry (CPOE)
  - Interact with (not harass) the physician at the time of order entry.
- Best Practice / Patient Care Focused; Not Cost-Reduction Focused
- Monitoring and Reporting
  - Building credibility and support for your next project.
- Share Successes
Complaints concerning unnecessary duplicate phlebotomy reaches CEO

Phlebotomy FastTrac performed.
- Numerous issues uncovered.
- Rich area for improvements -> numerous subprojects

Evidence secured that duplicate phlebotomy is a significant issue.
- How to control when some duplicates are valid, but many are not?
- Benefits:
  - Increased patient satisfaction,
  - decrease unnecessary blood draws with implications for iatrogenic anemia, and
  - decrease costs in a DRG payment scenario.
Initiatives

- Soft Stop Initiative
- Hard Stop Initiative
- Restricted Use Initiative
- Laboratory-Based Genetic Counseling
- Regional Smart Alerts
- Expensive Test Notification
- Extended Hard Stop
Initial Question

Will a clinical decision support tool that notifies the clinician that a duplicate test is being ordered change the behavior of ordering physician (i.e. will they discontinue the order)?

Assumption:
- The clinician is placing the order.
- CPOE may be in place, but unit clerks still place the orders.
- The clinician is reading the message.
- “Pop-up fatigue” – Evidence says: It’s real.
- The clinician cares about not ordering an unnecessary duplicate test.
The Limited Value of Electronic Notifications (Soft Stops)

“Pop-up box” fatigue is real.

- Too many pop-ups lead to caregivers not reading the information and clicking through
- (Evidence Forthcoming).

Initial Trial with Electronic Notification

Secondary Trial of Electronic Notification

Inconsistent finding and a hypothesis.
A CDST was used to notify that a duplicate test was being ordered.

This CDST allowed the physician to continue to place the duplicate order, if desired.

Autodefault “No”
Soft Stop Pilot Results

Trial 1: Quantitative CMV and EBV PCR
- Significant difference in same-day duplicate orders pre- versus post- intervention. (p < 0.0001)

Trial 2: C. difficile PCR
- No significant difference in same-day duplicate orders pre- versus post- intervention (p = 0.21)

Why
- Evidence that CDST Alerts are not read.
Example of “Pop-Up” Fatigue

- Repetitive firing of this decision support tool by the same physician (Doctor X, for example) suggests:
  - “pop-up” fatigue and
  - the caregiver is not reading the message.
The soft stop studies provided *evidence* to medical operations that a firmer intervention was needed.

They agreed, but...required a “break the glass” scenario in the event that a physician still wanted a duplicate study.

Duplicate tests were made available through the laboratory *Client Services* area.
**Warning:**

This lab test has been ordered in the last 24 hours; repeat testing is usually not warranted for this analyte within 24 hours. If you feel you need to override the alert please call Lab Client Services (216-444-5733).

HGB A1C was ordered on 5/13/10 at 1:10 PM by provider **KNOTT, PHILIP D**.

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Component</th>
<th>Result</th>
<th>Ref Range</th>
<th>Flag</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/13/10 1:37 PM</td>
<td>Hemoglobin A1C</td>
<td>7.2</td>
<td>4.0 - 6.0 %</td>
<td>H</td>
</tr>
<tr>
<td>5/13/10 1:37 PM</td>
<td>Estimated Average Glucose</td>
<td>160 mg/dL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These orders cannot be accepted.
Thirteen tests were selected for a pilot that were thought never to be needed more than once per day.

The list was vetted with the medical staff via Doc.com.

Institute a Hard Stop
- An electronic notification that this is a duplicate order and same day repeated testing for this analyte is usually unnecessary.
- Create a means for the caregiver to still order the test, but with documentation/approval.
Initial Hard Stop List

- Hemoglobin A1C
- CMV Detection, Blood
- Epstein Barr DNA Quant
- Hypercoagulation Diagnostic Interpretive Panel
- *C. difficile* EIA
- FACTOR V LEIDEN/PCR
- PROTHROMBIN GENE PCR
- Uric acid
- IRON + TIBC
- HEP REMOTE PANEL BL
- Lipid PANEL BASIC
- RETIC COUNT
- C-REACTIVE PROTEIN (CRP)

Uric acid removed after clinical input: May be needed more than once per day for during chemotherapy to monitor tumor lysis
Phased Implementation

Hard Stop Implementation

Phase 1:
- 12 tests that are NEVER needed more than once per day

Phase 2:
- Added 78 tests (total 88)

Phase 3:
- “Many more” tests added (>1,200 tests on the same-day Hard Stop list)
- Rapid review/removal process implemented

Initially: Physicians only, then -> all
- (35% of orders were non-physicians in the 1st month)

Governance is KEY

- Test Utilization Committee
- Feedback via “Doc.Com” (CCHS Intranet)
- Monthly Monitoring and Reporting
Impact of Rollout

Phase I and II: No complaints from caregivers.
Phase III: <5 complaints; all justified; list edited.

Very few caregivers called Client Services to have a duplicate order placed.

Reasons for duplicate disclosed educational opportunities in most instances.
## Cost Avoidance Based on Blocked Duplicates

<table>
<thead>
<tr>
<th>Test</th>
<th>Count of ID</th>
<th>Tech Tim</th>
<th>Prof Ti</th>
<th>Cost of Supplies</th>
<th>Total Cst</th>
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<tbody>
<tr>
<td>C. DIFFICILE EIA[24219]</td>
<td>31</td>
<td>527</td>
<td>0</td>
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<td>$380.99</td>
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<td>C-REACTIVE PROTEIN (CRP)[23342]</td>
<td>22</td>
<td>44</td>
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<td>$49.06</td>
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<td>3</td>
<td>30</td>
<td>0</td>
<td>$42.72</td>
<td>$57.12</td>
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<tr>
<td>HGB A1C[23607]</td>
<td>9</td>
<td>27</td>
<td>0</td>
<td>$15.39</td>
<td>$28.38</td>
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<td>IRON + TIBC[23655]</td>
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<td>$3.99</td>
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<td>9</td>
<td>117</td>
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<td>$66.76</td>
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<tr>
<td>RETIC COUNT[23971]</td>
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<td>19</td>
<td>0</td>
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<tr>
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<tr>
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<td>0</td>
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<td>$135.19</td>
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<tr>
<td>CMV DETECTION BLOOD[24221]</td>
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<td>$124.44</td>
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<tr>
<td>C-REACTIVE PROTEIN (CRP)[23342]</td>
<td>12</td>
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<td>$3.99</td>
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<tr>
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<tr>
<td>C-REACTIVE PROTEIN (CRP)[23342]</td>
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<td>0</td>
<td>$21.59</td>
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<tr>
<td>EPSTEIN-BARR DNA QNT[23153]</td>
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<td>14</td>
<td>0</td>
<td>$45.61</td>
<td>$52.33</td>
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<td>$15.75</td>
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<tr>
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<td>4</td>
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<tr>
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<td>58</td>
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<td>$576.13</td>
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<td>203</td>
<td>1637</td>
<td>0</td>
<td>$868.86</td>
<td>$1,654.62</td>
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</table>
Hard Stops

2014: 3,386 unnecessary orders prevented;
Full Program (1/11-12/14): 23,063 unnecessary orders prevented.

91-95% Success Rate
Unnecessary phlebotomies avoided and blood saved: A lot.
2014: Cost Avoidance - $79,554;  Total: (1/11 to 12/14): $361,549
Regional Smart Alerts

- Similar to Soft Stops.
  - But, with Previous Results Displayed.

- List includes: 752 of the 1,283 tests on Main.

- Considerations include:
  - Non-Cleveland Clinic Practitioners
  - Practitioner use of Computerized Physician Order Entry-availability
    - Written orders to unit clerks/nurses
  - No work-around infrastructure.
Regional Smart Alert

Warning:
This lab test has been ordered in the last 24 hours; repeat testing is usually not warranted for this analyte within 24 hours.

**LIPID PANEL BASIC (EU,F,V,HL,LL,K,LU,MM,SP)** was ordered on 9/20/12 at 12:53 PM by provider AGARWAL, RAJESH

If you are ordering **LIPID PANEL BASIC (EU,F,V,HL,LL,K,LU,MM,SP)** at the same time as other orders, you must first remove **LIPID PANEL BASIC (EU,F,V,HL,LL,K,LU,MM,SP)** from the order list before you can file the other orders.

<table>
<thead>
<tr>
<th>Date/Time</th>
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<th>Ref Range</th>
<th>Flag</th>
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<tbody>
<tr>
<td>9/20/12 1:59 PM</td>
<td>Triglyceride</td>
<td>333</td>
<td>30 - 149 mg/dL</td>
<td>H</td>
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<tr>
<td>9/20/12 1:59 PM</td>
<td>Cholesterol</td>
<td>222</td>
<td>100 - 199 mg/dL</td>
<td>H</td>
</tr>
<tr>
<td>9/20/12 1:59 PM</td>
<td>HDL Cholesterol</td>
<td>55</td>
<td>&gt;55 mg/dL</td>
<td>L</td>
</tr>
<tr>
<td>9/20/12 1:59 PM</td>
<td>VLDL-Cholesterol</td>
<td>33</td>
<td>6 - 40 mg/dL</td>
<td>L</td>
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<tr>
<td>9/20/12 1:59 PM</td>
<td>LDL Cholesterol</td>
<td>22</td>
<td>60 - 129 mg/dL</td>
<td>L</td>
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<tr>
<td>9/20/12 1:59 PM</td>
<td>Fasting Time</td>
<td>12</td>
<td>hrs</td>
<td></td>
</tr>
<tr>
<td>9/20/12 1:59 PM</td>
<td>TC:HDL Ratio</td>
<td>11.00</td>
<td>1.00 - 5.00</td>
<td>H</td>
</tr>
<tr>
<td>9/20/12 1:59 PM</td>
<td>LDL:HDL Ratio</td>
<td>5.00</td>
<td>0.50 - 3.55</td>
<td>L</td>
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<tr>
<td>9/20/12 1:59 PM</td>
<td>Non HDL Cholesterol</td>
<td>6</td>
<td>90 - 159 mg/dL</td>
<td>L</td>
</tr>
</tbody>
</table>

Do you want to accept these orders anyway?

[Yes]  [No]
Regional Smart Alerts

Monthly calculation of alert compliance

Euclid Hospital Lab Soft-Stop
May 2013 Report

44% Duplicate Averted
56% Duplicate Order Placed
5,618 unnecessary tests averted in 2014
Total (10 m 2013 + 2014) : 11,243

Regional Hospital Soft Stop Rolling Summary
(Soft Stop Review Started February 2013)
Regional Smart Alert: Cost Avoidance

- Cost-Savings, 2014: $45,213
- Total (10m 2013 + 2014): $91,244
Hard Stop versus Smart Alert Comparison

- One year comparison
  - Duplicate tests avoided and cost avoidance.

- The Hard Stop alert was significantly more effective than the Smart Alert (92.3% versus 42.6%, respectively; p < 0.0001).

- The cost savings realized per alert activation was $16.08/alert for the Hard Stop alert versus $3.52/alert for the Smart Alert.
Optimizing Molecular Genetic Testing

- Restricting Testing
  - Specialized tests not on standard menu “Lab Order Only”
  - Restriction to Users Groups

- Genetic Guidance
  - Laboratory-Based Genetics Counselor
    - With Molecular Genetic Pathologist Oversight.
  - Resident/Fellow Involvement
    - Educational/Not “Thrown to the wolves.”

- Algorithmic Testing
  - Collaborative Development (Clinician/Pathologist) of Algorithms
  - Extract/Hold -> Sequential Testing
    - Requires infrastructure & engagement.
Restricted Use Initiative

- Molecular Genetic Tests limited to “Deemed Users.”
- Inpatient testing requires a Medical Genetic Consult

2014: 76 Tests; $73,101;  
Total (11/11 to 12/14): 349 Tests; $784,127
Follow-up to Restricted Orders

Ambulatory

- n = 25 48%
- n = 16 31%
- n = 7 13%

- No further orders
- Clinical genetics referral
- Deemed user re-order
- Non-deemed user re-order

Inpatient

- n = 5 25%
- n = 15 75%

- No further orders
- Clinical genetics referral
- Non-deemed user re-order
Laboratory-Based Genetics Counselor with Molecular Genetics Pathologist

- Pre-Analytic Test Guidance and Post-Analytic Assessment
- Triage, Decreased panel use and assistance in selecting the appropriate test

2014: 191 tests for $246,406; Total (9/11 to 12/14): 452 tests for $1,067,292
Follow-up of Genetic Counselor Triage

- Cancelled: 88 (58%)
- Changed: 37 (24%)
- Order Proceeds: 27 (18%)

N = 152
Impact of Restricted Use and Genetic Counselor/MGP Triage Interventions
Expensive Test Notification

2014: 165 tests averted; $262,221
Cumulative (9 m.2013 + 2014):
   231 tests averted; $354,048

Order Validation

The following information is missing or may need your attention

The test(s) below costs the institution >$1000 to perform. Please consider carefully if this test is absolutely necessary, as charges, which may be substantially greater than costs, not covered by the insurance provider may be billed directly to the patient:

NEUROFIB TYPE 2 DNA [SQNEUFIB] >$3000

Do you want to accept these orders anyway? 

[Yes] [No]
Extended Hard Stop

- Time extended hard stop.
- Went live 11/2014 (after more than a 12 month build).

- C. difficile PCR
  - Once/7 days

- HbA1c
  - Once/month

- Constitutional Genetic Tests
  - Once/lifetime
Education

- Graduate Medical Education Initiative
  - Information on GME Website
  - Infographic produced.
    - General
    - Introduction to the most over utilized tests.
  - Infographics for Individual Overutilized Tests
    - ANA
    - *C. difficile* testing
    - TSH
    - Etcetera,
  - How to capture impact?

---

Additional content regarding appropriate lab testing, strategies, and patient care is accessible at the provided link and through Cleveland Clinic resources.
## Annual and Cumulative Totals

### 2014

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Duplicates</th>
<th>Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard Stops</td>
<td>3,386</td>
<td>$79,554</td>
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<tr>
<td>Restricted Use</td>
<td>76</td>
<td>$73,101</td>
</tr>
<tr>
<td>Genetics Counselor/MGP</td>
<td>191</td>
<td>$246,406</td>
</tr>
<tr>
<td>Regional Smart Alert</td>
<td>5,618</td>
<td>$45,213</td>
</tr>
<tr>
<td>Expensive Test Notification</td>
<td>165</td>
<td>$262,221</td>
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**Total:** 9,436  
**Cost Savings:** $706,495

### Cumulative Totals Through 2014

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Duplicates</th>
<th>Cost Savings</th>
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<tbody>
<tr>
<td>Hard Stops</td>
<td>23,063</td>
<td>$361,549</td>
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<tr>
<td>Restricted Use</td>
<td>349</td>
<td>$784,127</td>
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<tr>
<td>Genetics Counselor/MGP</td>
<td>452</td>
<td>$1,067,292</td>
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<tr>
<td>Regional Smart Alert</td>
<td>11,243</td>
<td>$91,244</td>
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<tr>
<td>Expensive Test Notification</td>
<td>231</td>
<td>$354,048</td>
</tr>
</tbody>
</table>

**Total:** 35,338  
**Cost Savings:** $2,658,260
Pearls of Pathology

• Test Utilization is part of our role and will likely become more so in the future.
  • Responsibility for pre- and post-analytics.

• The involvement of a pathologist or laboratorian brings balance and adds value.

• Utilizes and hones our skills in:
  • Practice-Based Learning and Improvement
  • Systems-Based Practice
  • Professionalism
  • Interpersonal Skills and Communication.
Improvements in Test Utilization designed to enhance patient care and promote best practices without alienating caregivers is possible.

Advantages Include:
- Decreases unnecessary phlebotomy.
- Increases patient satisfaction.
- Decrease false-positives
- Appropriate use of limited resources.
- Decreases cost.

Pathologists and other Laboratorians have an Opportunity in the Era of ACOs and Integrated Care.
- Participate in your Test Utilization Committee today,
- Become active at the Hospital Administration/ Systems level.