Key Learning Objectives

• To learn how an integrated laboratory service can leverage quality management thinking, Lean and ISO to improve testing service levels and capabilities that provide enhanced value to clinician practices

• To understand the critical role of designing and implementing systems and subsystems of management that focus on lab quality and cost control

• To understand the V-(alue) metrics of importance in defining the value of the medical laboratory and the pathologist in the changing clinical care continuum
Volume Driven Healthcare

Incentive: Do More

Efficiency Ranking
High Income nations

Increased life expectancy relative to $ spent

US ranking = 22 of 27

Life expectancy
15 days/ additional $100 spent

Value Driven Healthcare

Incentive: Do Better

Improve Health of INDIVIDUAL
Coordinated Care Better Outcomes

Improve Health of POPULATION
Expanded Coverage Chronic Care Mgmt At Risk Mgmt EHR Use

Spend less on services PER CAPITA
Bend the Cost Curve Reduced Reimbursements
Paradigm Change

Volume → Value

• **New** delivery care models
  - ↑ efficiencies, coordination of care, outcomes, satisfaction
  - ↓ spending $$
    - ACA- ACOs, Medical Homes
    - Hospital consolidations & acquisition priv practices
    - Clinically integrated private physician networks

• **New** payment models
  - Pay-for-Value reimbursement
    - PQRS, HCAHPS, Medicare Shared Savings Program

• **↑** primary care pay and **↓** specialty care pay
  - PAMA 2014 clinical lab reimbursement reductions
    - 30% 2017-2019 (10%/yr); 45% 2020-2022 (15%/yr)
Survival
Hear the wave before you see it
“If you don’t like change, you will like irrelevance even less”

-Gen. Eric Shinseki
<table>
<thead>
<tr>
<th><strong>Problem Background</strong></th>
<th>Implementation Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Laboratory is unrecognized as an asset to coordinate care, foster health system integration and cost control. More likely seen as cost center.</td>
<td>1. Non-conformance management- Work waste</td>
</tr>
<tr>
<td><strong>Hypothesis</strong></td>
<td>2. Daily management (QTIPS) -Critical values</td>
</tr>
<tr>
<td>We have either not created systems to do so or articulated the case for high value well.</td>
<td>3. Test utilization management, Lab Formulary</td>
</tr>
<tr>
<td><strong>Current Condition</strong></td>
<td>4. Personalized care management- Molec tests</td>
</tr>
<tr>
<td>• 3% of the cost; 70% of the EMR</td>
<td>5. Hospital IPD LOS improvement, MALDI-TOF</td>
</tr>
<tr>
<td>• Up to 90% clinical decision-making</td>
<td>6. Pathologists as teachers &amp; consultants</td>
</tr>
<tr>
<td>• Declining hospital revenue, staff reductions</td>
<td><strong>Results</strong></td>
</tr>
<tr>
<td>• Undeveloped lab systems to support call for coordination of care, system integration, cost control</td>
<td>The Value (V) metrics of lab survival</td>
</tr>
</tbody>
</table>

**Problem Analysis WHY?**

1. No one asked us to and it’s hard work
2. Hard to quantify clinical and cost success
3. Don’t have good metrics to share
4. Don’t have appropriate management subsystems

**Target Condition**

Document & achieve recognition for coordination, care integration & system savings
Obtain support for lab innovation & growth

**Action Plan**
Create subsystems & metrics to show value

**Do-Check-Act**

**Metrics**
1. Defect management, Epic errors
   - Reduction unacceptable specimens, rework $$, patient satisfaction
2. Safety, critical value notification failures
   - The V metrics
      - Test referral utilization control & savings
      - Appropriate therapy guidance & savings
      - IPD episode cost and LOS savings
      - Clinical consultation guidance

**Hypothesis**
We have either not created systems to do so or articulated the case for high value well.

Standardization
Customer focus in consolidated, integrated systems with ISO standardization, Lean leadership and management

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“The business of management is to manage. The thing to be managed is work”

“He still waste more than we use. We waste men, we waste materials, we waste everything, and consequently we have to work too hard and too long to accomplish what in the end amounts to very little.”

“It’s the work not the man that manages”
The Value (V) KPI Metric

• The currency of healthcare is now $$ rather than time - John Waugh

• Are you still pursuing TAT as your lab’s measure of success?
Performance => Productivity => Value $$ Metrics

There’s great future in value metrics

Cost per test, cost per episode of care, cost control, cost avoidance
Lab costs per adjusted discharge
The VALUE Metric
Customer Satisfaction in consolidating & integrating systems

Leverage Lean & ISO Management Systems

“Systems don’t produce quality, people do”

But systems provide standardization for people to:

• Deliver high quality consistently
• Focus on specific requirements of new and existing customers
• Identify poor quality rapidly and correct non-conformances
• Engage the workforce in continuous improvement
• Adopt preventive, not just corrective actions
The Processes of Managing for Continuous Improvement

Ongoing PDCA
Continuous Improvement

- Identify Defects Non Conformances
- Daily Resolution
- Daily Countermeasure
- PDCA-A3 Resolution
- Customer-Supplier Communication at level of work
- Team Leader Facilitation
- Standard Work, Connections, Pathways
- policy, procedure, document control
- Share the Gain Learnings

Identify Defects
Non Conformances

Resolution

PDCA

Daily Resolution

Daily Countermeasure

PDCA-A3 Resolution

Customer-Supplier Communication at level of work

Team Leader Facilitation

Standard Work, Connections, Pathways

policy, procedure, document control

Share the Gain Learnings
The Processes of Managing for Continuous Improvement

- Deviation Management
  - Identify Defects Non Conformances
  - Share the Gain Learnings

- Daily Management
  - PDCA Resolution
  - Daily Countermeasure

- Daily Resolution

- Audit System
- Development System
- Document Management
- Coaching System
- Team Leader System
- Ongoing PDCA Continuous Improvement
- Team Leader Facilitation
- Standard Work, Connections, Pathways
- Policy, procedure, document control
- Customer-Supplier Communication at level of work
- PDCA-A3 Resolution

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The Processes of Managing for Continuous Improvement

Audit System
Deviation Management

Development System

Document Management

Coaching System

Team Leader System

Ongoing PDCA Continuous Improvement

PDCA-A3 Resolution

Customer-Supplier Communication at level of work

Team Leader Facilitation

Standard Work, Connections, Pathways

policy, procedure, document control

Identify Defects Non Conformances

Share the Gain Learnings

Daily Resolution

Daily Countermeasure

Daily Management

Improvement Management

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Integrated System
Culture of Continuous Improvement

Tools of Improvement

- Standard Work
- 5S
- Visual workplace
- Continuous flow
- Pull production
- Kanban
- Just in Time
- Load leveling
- Batch size
- Mistake proof

Cultural Philosophy

- Customer 1st
- Continually develop your most valuable resource, your PEOPLE
- Continuous improvement
- From the level of the work
- Blameless management

Management Systems

- Hoshin Planning/Policy deployment
- Team leader system
- Improvement management (kata)
- Coaching and development (kata)
- Deviation management
- Daily management
- Document management
Deviation Management Process

<table>
<thead>
<tr>
<th>Daily deviations are encountered</th>
<th>Monthly deviations are tabulated and summarized</th>
<th>Monthly PDCA (A3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All Employees</strong></td>
<td><strong>Managers and Leaders</strong></td>
<td><strong>The Team</strong></td>
</tr>
<tr>
<td>• Stop</td>
<td>• Evaluate trends</td>
<td>• Problem Background</td>
</tr>
<tr>
<td>• Record on shared drive spreadsheet</td>
<td>• Identify the most common and the critical few</td>
<td>• Hypothesis</td>
</tr>
<tr>
<td>• Classify defect</td>
<td>• Prioritize improvements</td>
<td>• Current Condition</td>
</tr>
<tr>
<td>• Rapid resolution corrective actions</td>
<td></td>
<td>• Problem Analysis (RCA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Target Condition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Implementation Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Action plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Results</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Effectiveness Check (Metrics)</td>
</tr>
</tbody>
</table>

Continuous Process
## Taxonomy

### Deviation Classification Categories

<table>
<thead>
<tr>
<th>Main Categories</th>
<th>Number of Subclassification Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order Defects</td>
<td>36</td>
</tr>
<tr>
<td>Specimen Defects</td>
<td>13</td>
</tr>
<tr>
<td>Testing Defects</td>
<td>38</td>
</tr>
<tr>
<td>Report Defects</td>
<td>12</td>
</tr>
<tr>
<td>System Online Incident Report (RadicaLogic)</td>
<td>3</td>
</tr>
<tr>
<td>Complaints</td>
<td>4</td>
</tr>
<tr>
<td>Safety</td>
<td>2</td>
</tr>
</tbody>
</table>
Deviation Management Progression

Surveillance Events Documented 2012-2014

Optimization
(new subclasses, new graphs, ease of use, new documentation forms)

Roll out to larger sites

Roll out to all sites

Deviation process was piloted

New EMR Implementation

42% Participation in 2012
95% Participation in 2013
100% Participation in 2014

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Top 35 Defects

QTR 2 PALM Deviations (excluding TRM and HFML) Subclass Summary Graph

- **Time = $$**
- **Redraw = dissatisfaction**
- **Integrity = safety**

Clinic Collect vs Lab Collect - Incorrect Entry Not Registered in Epic

Specimen Integrity

Reprint Epic Printout

Atlas to Epic / Epic to Sunquest
Epic Orders Improvement - All Hospitals

Surgical Pathology EMR Tissue Part Type Defects

First customer supplier meeting with OR Nursing at Main Campus
Second customer supplier meeting with OR Nursing at Main Campus
Customised part type ordering lists were updated for each speciality
Customer supplier meeting (Pathology and OR admin)
Reduced extremity part type choices, 24 to 12
Educated at RN meeting at HS
One on one education to not use generic part types when specimens delivered to the lab

Main hospital
Comm hosp 1
Comm hosp 2
Comm hosp 3

<table>
<thead>
<tr>
<th>Month</th>
<th>Main hospital</th>
<th>Comm hosp 1</th>
<th>Comm hosp 2</th>
<th>Comm hosp 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>187</td>
<td>47</td>
<td>21</td>
<td>0</td>
</tr>
<tr>
<td>Feb</td>
<td>173</td>
<td>37</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Mar</td>
<td>129</td>
<td>31</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Apr</td>
<td>64</td>
<td>18</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>May</td>
<td>28</td>
<td>14</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>June</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Daily Management

“A legacy of quality”

Daily Management Board

Q  T  I  P  S
Quality  Time  Inventory (or WIP)  Productivity  Safety
**Visual Management At-a-Glance**

DAILY Gemba Rounds with workers

- Each square has all days of month
- Color each per performance
  - RED: METRIC FAILED THRESHOLD
  - GREEN: METRIC MET THRESHOLD

**Trendlines**

- Trend challenging metrics
- Day, week, month, year…
  - BLUE: THRESHOLD
  - RED: TIME OF FAILURE
  - GREEN: TIME PASSING THRESHOLD

**Countermeasures:**
Corrective & Preventive Actions
Assign responsibility and Accountability for completion

**Pareto Charts, RCA etc.**

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Why</th>
<th>How</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Root Cause Analysis**

**Corrective Actions**

**Preventive Action Plan**

**Work Group Specific Metrics**

**Daily, Weekly, Monthly, Annual Trends**
## DM Metrics June 2013-2014

<table>
<thead>
<tr>
<th>LAB Division</th>
<th>No. Daily Metrics in 1 yr</th>
<th>No. Long term &gt;6 mo</th>
<th>No. Short term 1-6 mo</th>
<th>No. derived process improvements</th>
<th>Q</th>
<th>T</th>
<th>I</th>
<th>P</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Lab</td>
<td>14</td>
<td>12</td>
<td>2</td>
<td>8</td>
<td>1</td>
<td>5</td>
<td>6</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Lab Support</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Chemistry</td>
<td>6</td>
<td>6</td>
<td>-</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Micro/Sero</td>
<td>9</td>
<td>9</td>
<td>-</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td>Transfusion</td>
<td>5</td>
<td>5</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Surgical</td>
<td>19</td>
<td>11</td>
<td>8</td>
<td>17</td>
<td>10</td>
<td>4</td>
<td>4</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Cytology</td>
<td>4</td>
<td>4</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Molecular</td>
<td>5</td>
<td>5</td>
<td>-</td>
<td>3</td>
<td>4</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>64</strong></td>
<td><strong>53</strong></td>
<td><strong>11</strong></td>
<td><strong>42</strong></td>
<td><strong>22</strong></td>
<td><strong>14</strong></td>
<td><strong>15</strong></td>
<td><strong>8</strong></td>
<td><strong>5</strong></td>
</tr>
</tbody>
</table>

### No. Unique Metrics/Year

<table>
<thead>
<tr>
<th>Department</th>
<th># of Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td>19</td>
</tr>
<tr>
<td>LSS/LSC</td>
<td>11</td>
</tr>
<tr>
<td>CHEM</td>
<td>10</td>
</tr>
<tr>
<td>MICRO/SERO</td>
<td>8</td>
</tr>
<tr>
<td>TRM</td>
<td>7</td>
</tr>
<tr>
<td>CTG</td>
<td>6</td>
</tr>
<tr>
<td>MOL</td>
<td>5</td>
</tr>
</tbody>
</table>

### QTIPS Domain Usage

- Q: 34%
- T: 22%
- I: 23%
- P: 13%
- S: 8%
Safety

Owners: Jackson/Smothers/Rahman

Month: August 2013

Meeting Time: 11:30

Metric:
All CVs called: green
Any CVs missed: red
Critical Value Defect Rate

First 3 months…

Steady Drop in Critical Value Callback Failures
Critical Value Defect Rate

First 8 months...

Dec 12
0.7/day

Aug 13
0.3/day

Improvement!
Reduction in Critical Value Defects. This graph represents the improvement in the performance of our laboratory’s safety (S) metric related to notification and documentation of a critical value notification to an ordering provider. It represents the initial gains in performance during deployment (December 2012-May 2013), subsequent monitoring of performance (April 2013-August 2014) impacted by varied root-causes (↑) and improvements through countermeasures (↓).
## Personalized Cancer Care Management

### Molecular Profile

<table>
<thead>
<tr>
<th>Targeted Therapeutic</th>
<th>Cost of Treatment</th>
<th>Pharma Cost Savings 2012</th>
<th>Pharma Cost Savings 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EGFR (Gefitinib)</strong></td>
<td>$72,000</td>
<td>$14,184,000</td>
<td>$14,832,000</td>
</tr>
<tr>
<td><strong>ALK FISH (Crizotinib)</strong></td>
<td>$72,000</td>
<td>$12,600,000</td>
<td>$13,248,000</td>
</tr>
<tr>
<td><strong>BRAF (Ipilimumab)</strong></td>
<td>melanoma</td>
<td>$120,000</td>
<td>$1,560,000</td>
</tr>
<tr>
<td><strong>Her2 FISH (Herceptin)</strong></td>
<td>breast</td>
<td>$70,000</td>
<td>$12,180,000</td>
</tr>
<tr>
<td><strong>KRAS (Cetuximab)</strong></td>
<td>colon</td>
<td>$125,000</td>
<td>$5,750,000</td>
</tr>
<tr>
<td><strong>Testing cost</strong></td>
<td>--</td>
<td>($253,994)</td>
<td>($243,551)</td>
</tr>
<tr>
<td><strong>Reimburse</strong></td>
<td></td>
<td>$173,881</td>
<td>$176,796</td>
</tr>
</tbody>
</table>

**Pharma cost savings (Neg tests X cost Rx)**: $46,274,000 for 2012 and $50,270,000 for 2013.
Infectious Disease Episode of Care

Performance Metric TAT Blood Culture
Pre & Post MALDI-TOF

- ~33% decrease overall TAT ID reporting
- Annual lab testing cost savings = $115,000
• ~33% decrease in overall TAT ID report translates to:
• ~33% decrease LOS (~14 to 9 days)
• LOS = $4147/day
Cost savings associated with LOS

- Average reduction LOS = 4.78 days
- Average reduction Costs/LOS = $19,822.66 per Candida sepsis episode
- Projected annualized LOS cost savings = $1,110,069.00
- Plus annual lab savings = $1,225,069.00
Test Utilization Management

Without Formulary

Provider Request for Esoteric Tests → Reference Laboratory Marketing

Pathologist Review for appropriateness

Reference Laboratory

High $$ : Low Standardization → Chaos
Test Utilization Management

Without Formulary

Provider Request for Esoteric Tests → Reference Laboratory Marketing → Reference Laboratory

Pathologist Review for appropriateness

With Formulary

Provider Request for Esoteric Tests → Pathologist Review → CETAC Review → MLFC Review → Reference Laboratory

Reference Laboratory Marketing

High $$ : Low Standardization → Chaos

Low $$ : Standardization → Better Utilization
Test Utilization Management

Receive New Test Service Request

Identify Leads: Pathology & Clinician

Gather Information on Lab and Charges

Medical and Financial Impact Analysis

Discuss at CETAC Meeting, make determination

Memorandum and notification to Med. Lab Formulary Committee

Lab CETAC
11 Voting
5 Non voting

Anatomic Pathology
Clinical Pathology
Molecular Genetic Pathology
Billing
Support Services

28 Tests [$85 - $5800]
2 Unrestricted [$55-$140]
19 Restricted [$84-$2500]
7 Not Available [$93-$5800]
# Test Utilization Management

## Cost-Avoidance

<table>
<thead>
<tr>
<th>Test</th>
<th>Vendor Claim</th>
<th>CETAC Determination</th>
<th>Cost and Reimbursement</th>
<th>Potential Cost Avoidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assay 1</td>
<td>A genomic profile that helps physicians make treatment decisions.</td>
<td>NOT AVAILABLE</td>
<td>Cost: $5800 and $7500</td>
<td>&gt;$10 million/year</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reimbursement: $0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LOSS: $5800-$7500/test</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reasons:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- No FDA approval</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Not in NCCN guidelines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Not for HFHS Trials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assay 2</td>
<td>Quantitative assessment of the likelihood of distant recurrence in patients diagnosed with ER+ node-negative breast cancer.</td>
<td>NOT AVAILABLE</td>
<td>Cost: $3500</td>
<td>&gt; $3.5 million</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reimbursement: $150</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LOSS: $3350/test</td>
<td></td>
</tr>
<tr>
<td>Assay 3</td>
<td>Aid in the classification of the tissue of origin and tumor subtype in conjunction with standard clinical and pathological assessment by a qualified physician.</td>
<td>NOT AVAILABLE</td>
<td>Cost: $4750</td>
<td>&gt;1.4 million/year</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reimbursement: $0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LOSS: $4750/test</td>
<td></td>
</tr>
<tr>
<td>Assay 4</td>
<td>Tests for *** protein and **** may be used as supplemental tests to help establish a diagnosis of Alzheimer Disease.</td>
<td>NOT AVAILABLE</td>
<td>Cost: $1160</td>
<td>&gt;110,000/year</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reimbursement: $52</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LOSS: $1108/test</td>
<td></td>
</tr>
</tbody>
</table>

In HFHS, 2000 cases/year will qualify for 'genomic testing for potential targets'. This will be in addition to routine pathological diagnostic work-up.

> 300 cases/y of breast carcinoma are diagnosed in HFHS. A cohort of >1000 patients may qualify per vendor claim.

Per vendor claim, test is to be used in 30% of metastatic cases that remain unclear.

If we assume 30% malignancies are metastatic at diagnosis then HFHS has 300 cases/y (i.e. 10% of the total 3000) that may qualify per vendor criteria.

Per clinical expert, the utilization of this test is expected to be around 100 cases/year.
Test Utilization Management
The Path Forward....

- Formulary
- EMR Tools
- Protocols
  - Outpatient Testing

- Complexity

2014
2015
2016

Esoteric Testing
Inpatient Testing
Value of Clinical Consultant

What pathologists bring to the table....

Physician who can interface with other physicians

Understands the medical implications and technical limitations

Can suggest and provide rationale for alternative testing modalities

What pathologists need from the administration....

Medical laboratory has to be visible and involved in decision making

A mechanism must exist for interaction and exchange of information

Must be recognized and incentivized for improving lab utilization

What pathologists bring to the table....

Physician who can interface with other physicians

Understands the medical implications and technical limitations

Can suggest and provide rationale for alternative testing modalities

What pathologists need from the administration....

Medical laboratory has to be visible and involved in decision making

A mechanism must exist for interaction and exchange of information

Must be recognized and incentivized for improving lab utilization
Value Metrics

Won’t always be cost and productivity but…. 

Downstream episode of care efficiencies and clinical outcomes
Relating to Value Metrics

The language of the hospital C-Suite

- Risk Adjusted LOS (case type and severity)
- Emergency Room LOS
- Case Mix Adjusted Episode Costs
- Risk Adjusted Early Readmission Rate
- Average Time Emergency Department (ED) Door to Bed Average Time
- ED Treatment to Release
- Divert Hours for ED
- Pharmacy cost/DRG
- RVUs/DRG
- Cost per unit of service
- Salary Expense per Adjusted Patient Day
- Full Time Equivalents (FTE) per Adjusted Patient Day
- Supply Expense per Adjusted Patient Day
Are You Ready to Unleash the Power of Pathology’s V-Man?
“Improved efficiency is only meaningful when it leads to cost reduction. This requires producing the required amount with the least resource.”

“Efficiency improvement must be looked at not only at the level of individual people, lines staffed by teams of people, and groups of these lines but as efficiency of the entire system.”

-Taiichi Ohno