Real Time Management of All Operational Domains and Workflows in Your Laboratory

Chris Christopher
Vice President Global Customer Solutions

Today’s Agenda

Real Time Management of All Operational Domains and Workflows in Your Laboratory

- IVD Industry Trends and Challenges
- Operational Domains
- Workflows Discussion / Needs
- Real Time Solutions – the Future?
Trends & Challenges

**IVD Anticipated Growth over Next 6 Years**

$49,843.5m by 2016 at the CAGR of 4.3% over the next seven years

**DRIVERS:**
1) New technological advancements
2) A shift towards more complex immunochemistry tests to Point of Care (POC)
3) The adoption of cost cutting measures such as increased automation and self testing.

Source: GBI Research
January 2010

---

**How far can we see ahead...**

*With new Healthcare Reforms, what will happen to Laboratory:*

Any ideas?

|-----------|-----------------|---------------|----------|-----------|

---

CAGR (Compounded Annual Growth Rate)
What are some of the Key Survival Strategies that will be needed in Managing the Laboratory during the next 5 years?

Adapting to new Healthcare Reforms

Survival Planning

Outreach?
Budget management / Cost Control?
Automation?
Point of Care?
Workflow Optimization?

Consolidation

Will Laboratory Consolidation continue in mature markets? If so, what are some of the Likely Drivers?

- Need for cost reduction
- Increased test volume
- Aging population of private lab owners who are likely to sell and retire
- Complexity of testing market
- Availability of qualified staff
Today’s Agenda

Real Time Management of All Operational Domains and Workflows in Your Laboratory

Operational Domains

- Real Time Solutions – the Future?
- Workflows Discussion / Needs
- Operational Domains

Operational Domains…

Monitoring All Aspects

- Informatics
  - HIS
  - LIS
  - Middleware
  - Instrument

Materials
- Reagents
- Supplies

Labor
- Technical
- Non-technical
- Management

Departments / Workstations

- Chemistry
- Automation
- Immunoassay
- Send Outs
- Hemostasis
- POC
- Urinalysis
- Blood Bank
- Diabetes
- Molecular
- Microbiology
- Blood gas
The Lab is a highly complex 24/7 business with many inputs and outputs!!!
The Ultimate Mission: *Exceed Physicians’ Expectations for Error Free and Fast Turn Around Time for All Lab Orders for the Lowest Total Cost while maintaining Highly Motivated Staff & a Safe Environment*

from Order to Receipt to Analyze to Report

Today’s Agenda

Real Time Management of All Operational Domains and Workflows in Your Laboratory

IVD Industry Trends and Challenges

Operational Domains

Workflows Discussion / Needs

Real Time Solutions – the Future?
Key Challenges for Today’s Lab Managers

What Information can we get for My Staff on a Real Time Basis to Optimize the overall Operation of the Lab?

Lab Metrics Discussion

In an ideal world, describe the types of charts and graphs that the lab management needs real time in order to establish the optimal performance and customer satisfaction.

Preanalytical  Analytical  Post Analytical
from Order to Receipt to Analyze to Report
Today’s Agenda

Real Time Management of All Operational Domains and Workflows in Your Laboratory

IVD Industry Trends and Challenges

Operational Domains

Workflows Discussion / Needs

Real Time Solutions – the Future?

Next Generation Central Lab Middleware

Data Management

• LIS Connectivity
• Review Test Results
• Manage Quality Control
• Manage Autoverification
• View Sample Data

Process Management

• Monitor Instrumentation
• Manage Exceptions
• Optimize Operations
• Push Notification
• Remote Control
Real Time Solutions

*From Data Management to Process Management*

**What solutions are available...**

- ... to Measure Quality, TAT, Productivity?
- ... to help **Staff** prioritize and focus daily on the correct issues? *(the above + development)*
- ... to provide **Supervisors** with early detection of problems?
- ... for **Lab Administrators** to simplify the work environment through real time reporting?
- ... that can improve **Customer** Satisfaction?

**How we are going to get there together...**

*In pursuit of Operational Excellence*

**Data**
- Real Time Flow
  - HIS
  - LIS
  - Middleware
  - Instruments

**Requirements**

**Key Areas to Measure Real Time**
- Instrument / Workstation Performance
- Connectivity across Domains
- Integrated Quality Control

**Process Management**

**Improvement Targets**
- Error Elimination
- Quality Control Management
- Productivity Increase
- Faster TAT
- Exception Management

**Dashboard**
Examples: Real Time Solutions from Data Management to Process Management

Leading the way

Improving both Operations & Customer Satisfaction

Quality / Error Reduction

Productivity

Turn Around Time

ERROR REDUCTION: Specimen Handling Data Input from Manual Entry to Instruments Errors

<table>
<thead>
<tr>
<th>Collection</th>
<th>Transport</th>
<th>Pre-analytical Processing</th>
<th>Analytical Processing</th>
<th>Storage &amp; Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Wrong patient drawn</td>
<td>• Lost containers</td>
<td>• Missing label</td>
<td>• Bar code labels misaligned</td>
<td>• Inability to locate stored samples</td>
</tr>
<tr>
<td>• Drawn at wrong time</td>
<td>• Broken containers</td>
<td>• No bar code labeling</td>
<td>• Loose labels</td>
<td>• Inability to track samples</td>
</tr>
<tr>
<td>• Drawn in wrong tube</td>
<td>• Specimen condition unacceptable</td>
<td>• Wrong bar code applied in the lab</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Tubes drawn in wrong order</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Labels applied on wrong tubes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Labels misaligned on tubes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Illegible collection data on label</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Collection data omitted from label</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

{ Majority of errors are here }
Hemolysis Flag by Location

Are Collections impacting TAT?

Example: Labeling
Preanalytical Error Reduction ➔ Collection to Analyze
Patient name on container labels to be obscured
holzst00, 11/03/2008
Patient Identification Check
Connectivity from HIS to LIS to Collection

Data Integration / Process Management

Computer Cart on Wheels for Blood Administration and Decentralized Specimen Collection

Mobile Unit for centralized Specimen Collection

Examples: Real Time Solutions Converting Data into Operations Management

Improving both Operations & Customer Satisfaction

Leading the way

Quality / Error Reduction
Productivity
Turn Around Time
Real Time Data Integration

Decision Support / Dashboard System

Production / Workload:

*What’s happening Overall in the Department?*

Reported Test Results by Day

Chemistry
Production: What’s happening by Hour in the Department?

Completed Accessions by Hour

Chemistry

Hour of Day

Production: What’s happening by Instrument?

Production Tests Detail - (One Day)

All Instruments

Hour of Day

Day: 21 Accessions of Total Accessions 264

Day: 5 All Instruments Tests: 10:30
Production:

How are we loading the Instrument?

Instrument Utilization Analysis:

How are the Instruments being operated?
In Lab Analysis

Are we processing orders efficiently?

Received vs. Resulted Test by Instrument
Chemistry

Turn Around Time:

Are we meeting our TAT Goals? If not, WHY?
**Turn Around Time:**

*Preanalytical Breakout*

---

**Pre-analytical Cycle Time (Minutes)**

All Tests - (One Day)

Priority STAT

---

**Statistics**

- N: 750
- Mean: 53.3
- Std. Dev.: 30.15
- Median: 107.5

Day: 6 Total Selected Tests: 750 (Percent of Total Tests: 8.21) Total All Tests: 9,213

---

**Turn Around Time:**

*Analytical Breakout*

---

**Analytical Turnaround Times by Hour**

All Tests - (One Day)

Priority STAT

---

**Statistics**

- N: 750
- Mean: 5.1
- Median: 3.16
- 99th: 12.0

Day: 6 Total Selected Tests: 750 (Percent of Total Tests: 8.21) Total All Tests: 9,213

---
Turn Around Time: 

**Tracking Instrument Performance**

**Decision Support / Dashboard System**

![Test Production - Bar Analytical Time - Line Instrument ID 1 Priority STAT](image1)

Day: 5 Tests 442 of Total Tests 9,287 (Percent 5%) All Tests Analytical TAT Mean 20.2 SD 15.81 (Minutes)

---

**Standard Work: Tube Type Utilization**

*Are we achieving our standardization goals?*

**Decision Support / Dashboard System**

![Production Tubes - (One Day) All Instruments](image2)

Day: 5 Total Tubes: 1,139
Test Order Type

What is the impact of Add-On Testing?

Accession Priority by Hour

Are STATs random or predictable?
What’s Next in Data Management?

Copyright © Siemens AG 2010. All rights reserved.
Integrated Real Time Information Access System
Where will the Demand most likely be in the Future?

Integration of Healthcare Diagnostics

Imaging IT  Diagnostics IT
Real Time Management of All Operational Domains and Workflows in Your Laboratory

Thank You

Chris Christopher
Vice President Global Customer Solutions