Laboratory Automation
In Clinical Pathology:

Making the right choices
For your laboratory

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Current Laboratory Challenges

– Most labs operate in 1980 mode
– Technical staff—average age 47
– Decreasing reimbursement--capitation
– Paradox—more computers—fewer with computer knowledge—IT Depts
– Most are unfamiliar with modern manufacturing methods
• Incredible Opportunities
  – Potential to utilize techniques from other industries
  – Adapt & apply modern (Lean) manufacturing methods
  – Develop and apply new ideas and concepts
  – Reduce fixed & variable Costs
  – Expand services to new markets
Achieving High Performance

- Flow & Real-time analyses
- Systems Integration
• Lean Manufacturing Principles
  – Do workflow analysis
  – Study & question every motion
  – Revise and clean up operation
  – Reduce or eliminate unproductive sample handling
  – Be willing to change the system
Flow & Real-Time Analyses

- Processing Area
- High Volume & STAT
- Medium Volume
- Low Volume
- Aliquoting
- Storage

Distance Traveled

Volume
• Lab Automation
  – Total Lab Automation vs Modules
  – Cost & ROI
  – Ability/Inability to handle STATS
  – Tube size limitations
  – Be aware of hidden costs/motions
  – Expensive items—centrif & aliquoters
• Lab Automation
  – Instrument vendor vs independent LAS vendor
  – LIS costs
  – Renovation costs
  – Bundle costs with instrumentation
• Pre-Analytical

- Ordering tests via Internet
- Sample Processing
- Aliquot samples???
- Deliver samples to work areas
- Automation decreases time & errors
Direct Track Sampling

Start

950  950  950  250  250  Architect  Architect

End  Aliquot

SMS-Immulite 2000*  SMS-Immulite 2000*  Olympus  Olympus  AxSYM  AxSYM
• Analytical
  – Direct track sampling
  – Stability & long term calibrations
  – Read bar codes
  – Large menu
  – Disposable tips
• Post-Analytical
  – Think beyond autoverification
  – Post-Analytical Intelligent Systems
  – Handle complex algorithms
  – Low labor requirements to operate
  – Reduce apprenticeship requirements
• Post-Analytical
  – “Middleware”
  – Provided by several vendors
  – Superior to “Autoverification, 1st Gen”
  – Positioned between LIS and instruments
  – Excellent backup in case of LIS failure
• Major Automation Vendors
  – Bayer--SKCL
  – Beckman-Coulter--IDS
  – Lab Interlink--Labotix
  – Roche--Hitachi
  – OCD-Thermo
• Bayer
  – Old SKCL System
  – Bundled with their instruments
  – Fast, carrier based
  – Uses direct track sampling
  – Chemistry, immunoochem & hematology
• Beckman-Coulter
  – One of oldest
  – Bundled with their instruments
  – Slower, carrier based
  – Infrequent direct track sampling
  – Chemistry, immunochem & hematology
  – Tube size limitations
- Lab Interlink-Labotix
  - One of oldest, bankruptcy & sold
  - Uses many different instruments
  - Slower, boat based
  - Uses direct track sampling
  - Chemistry, immunochem & hematology
• Roche-Hitachi
  – One of oldest
  – Bundled with their instruments
  – Slower, rack based, not STAT friendly
  – Large sorter used up front
  – Chemistry, immunochem & hematology
  – Limited tube sizes
• OCD-Thermo
  – One of the newest
  – Bundled with their instruments
  – Carrier based
  – Cost is uncertain
  – Chemistry, immunochem & hematology
  – Limited tube sizes
• Focus on the following items:
  – Ability to handle STATS
  – Direct track sampling
  – Handle multiple tube sizes
  – Low cost
  – Efficient designs
  – LIS Vendor
The Modern Laboratory

Lab Automation

Visit Sites
- Do your own homework
- Visit many sites
- Think about the process
- Use common sense

Develop Clear Vision
- Vendor is not best source of information
- Work with lab to develop detailed plan to meet your specific needs

Do your own financial analysis
- Cost justify each major component
- ROI is the big lie
- Do not let the vendor do your financial analysis

Conclusions
- The rewards for good choices are great
- Automation is the way of the future
- Most systems take 20 months to complete

Conclusions & Comments