Turbo Charging Your Core Lab: When to Automate Work Cells… When to Lean…When to Do Both

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Background

- **Steve Stone**, Managing Director, Argent Global Services
- Process-Engineering and Management Consulting firm
- Argent pioneered many engineering services for the Diagnostics Industry w/ 20 + years Health Care experience
- Skill Set & Methodology include:
  - Industrial Engineering
  - Lean Enterprise & Six Sigma
  - Data Collection & Information Gathering
  - Facility Design & Layout
  - Management Tools & Software

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Turbo Charging Your Core Lab: When to Automate Work Cells… When to Lean…When to Do Both

Core Lab

- Clinical laboratory services
- Core labs are typically high-volume and automated
- Components
  - Central Processing
  - Chemistry / Immunoassays
  - Hematology / Coagulation

Core Lab

- 90 – 95% of all tests in the clinical lab
- Most tests have short TAT expectations
- Designed to support STAT orders
- Close proximity to central processing
- A Core Lab is key place to start with efficiency and productivity

Closer Than You Think

- When executing a Core Lab, a Lean Work Cell or Total Laboratory Automation are not as far apart as you would think

Closer Than You Think

Feature	Lean Work Cell	TLA
Open Floor Plan	●	●
Core Lab	●	●
Integrated with Front-End	●	●
Continuous Flow	●	●
Reduce Steps (NVA)	●	●
Cross Train Staff	●	●
Standardized Work	●	●
Reduction in Travel	●	●

From the Baseline

- Both concepts will result in improvement / productivity increases over a traditional lab
- Traditional Lab:
  - Departmentalized – more barriers
  - Core testing has separate value streams
  - Fewer shared resources
  - Less cross training and communication
  - May or may not utilize central processing
  - Inefficiencies built-in

What is Your Baseline

Where are you starting from:

- Understand the entire value-stream
- What are your real needs?
- Define your goals and objectives
  - what is the end-game?
- Determine your level of commitment

Lean Work Cells

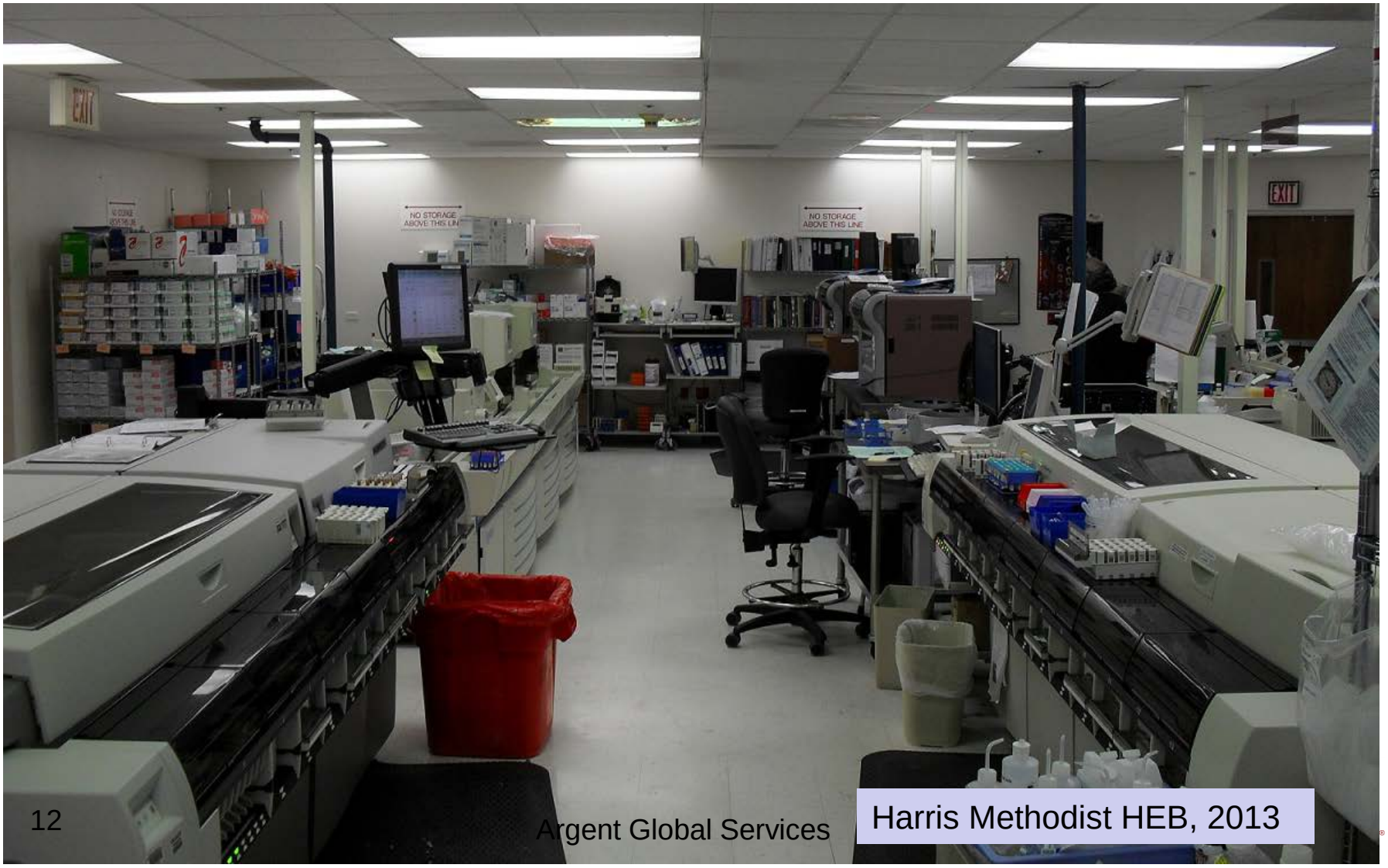
- Lean Work Cells were developed from Core Lab concepts
- Lean tools and methodologies have been added to:
  - Ensure standardized work
  - Ensure continuous flow
  - Reduce non-value add steps
  - Address the entire value stream
  - Sustainability and continuity

Lean Work Cells

Benefit / Outcome	Traditional Lab	Lean Work Cell
Improved TAT		◉
Productivity of Staff		◉
Utilization of Equipment		◉
Space Utilization		◉
Standardized Work / Quality		◉
Improved Communication		◉

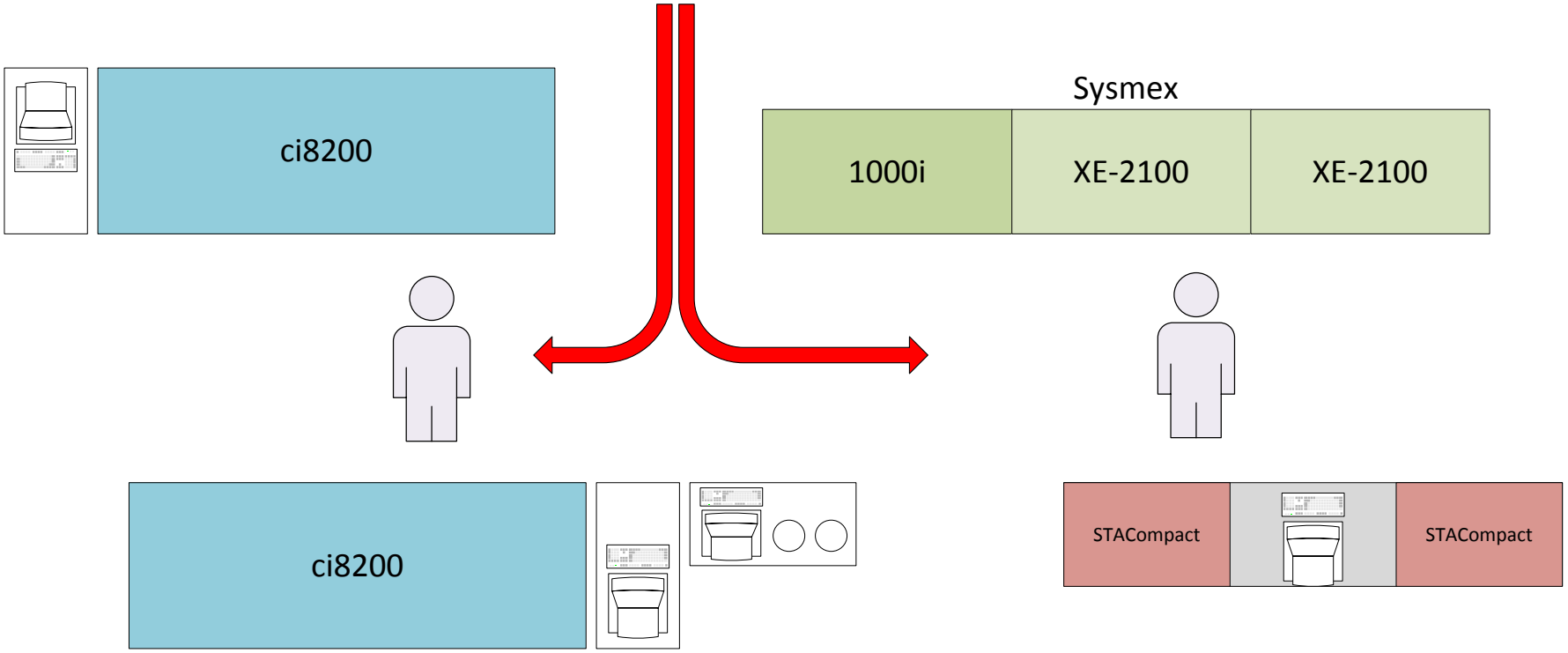
◉ = Advantage ○ = Partial

Lean Work Cell Example



Harris Methodist HEB, 2013

Lean Work Cell Example



Staff Quote

"Set-up is very efficient, standardized with everything together – we don't have a lot of downtime with specimens and that helps keep the TAT low."

"The set-up is the main factor in achieving our goals"

– Terry Reeves, MT(ASCP)
  Lead CLS - Core Lab
  Texas Health Harris Methodist Hospital

Boston Laboratory - Lean Work Cell

Provided by Mick Chomyn, Path Links, 2013

Boston Blood Science Laboratory - Mirrored Work Cells

Provided by Mick Chomyn, Path Links, 2013

Boston Blood Science Laboratory - Mirrored Work Cells

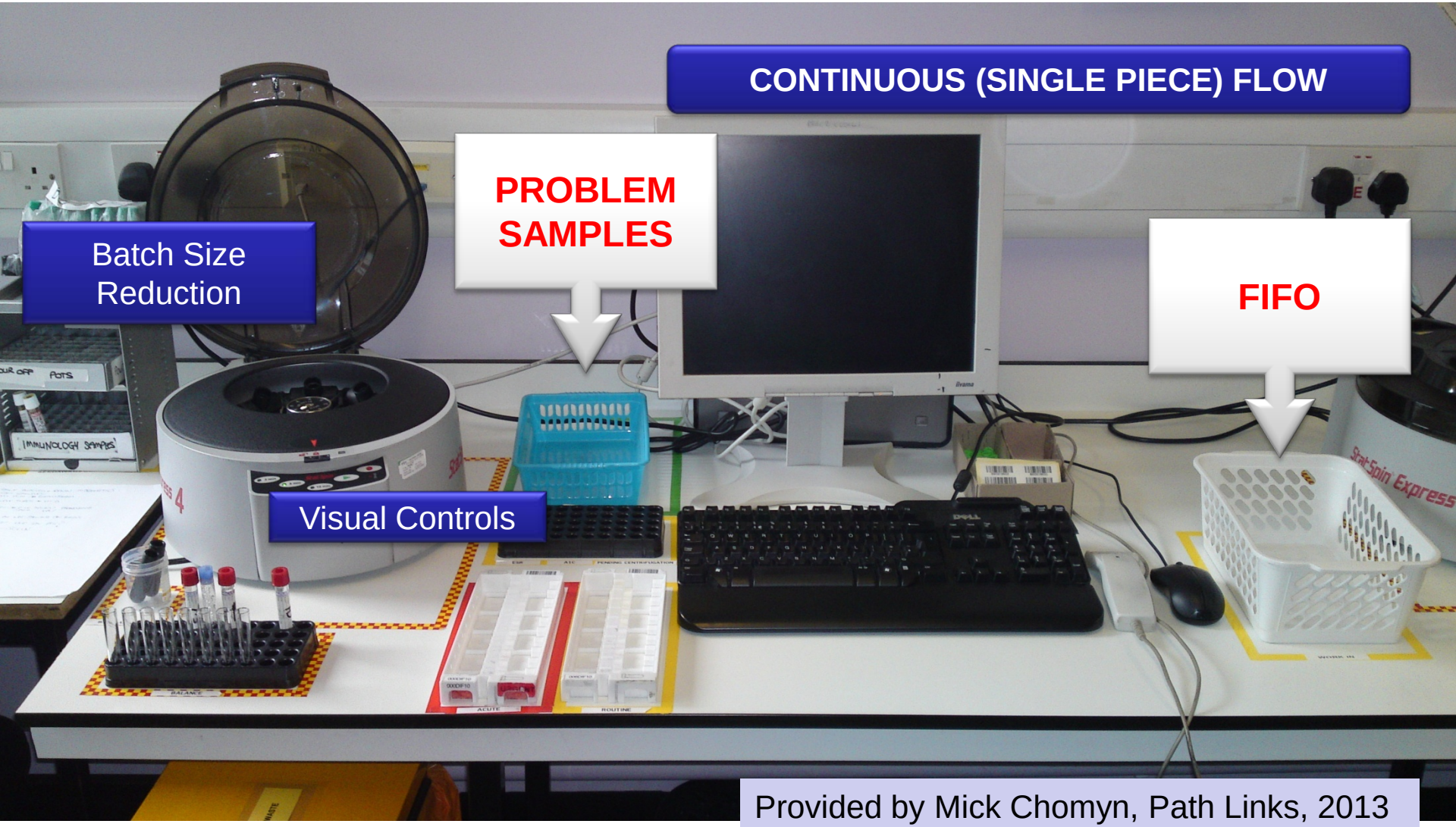
Provided by Mick Chomyn, Path Links, 2013

Boston Blood Science Laboratory - Validation Work Cell

Provided by Mick Chomyn, Path Links, 2013

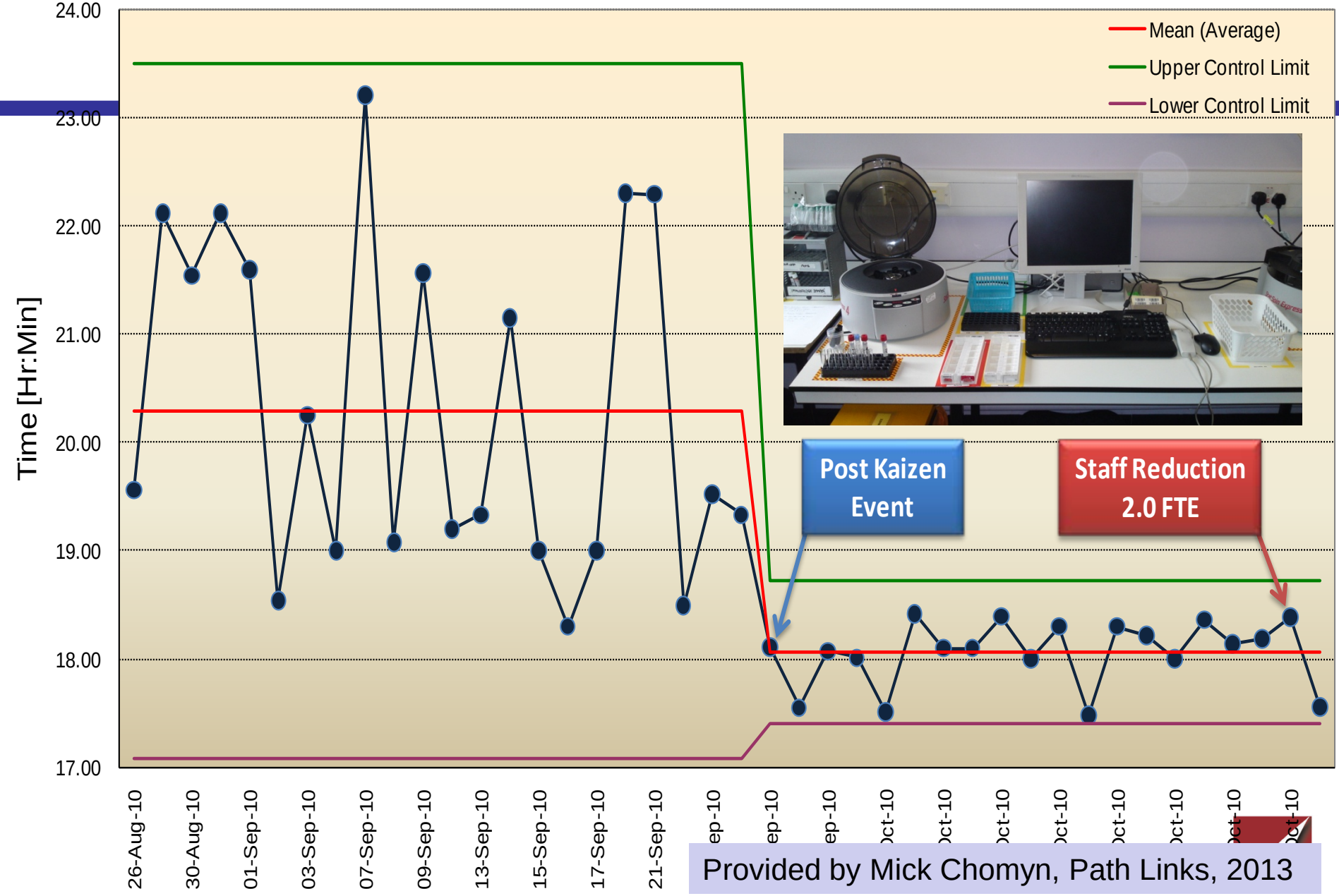
Boston Blood Science Laboratory Plan

Pre-Analytical Work Cell



Provided by Mick Chomyn, Path Links, 2013

Impact of Lean Pre-Analytic Work Cell - Time of Last GP Sample Data Entry



Provided by Mick Chomyn, Path Links, 2013

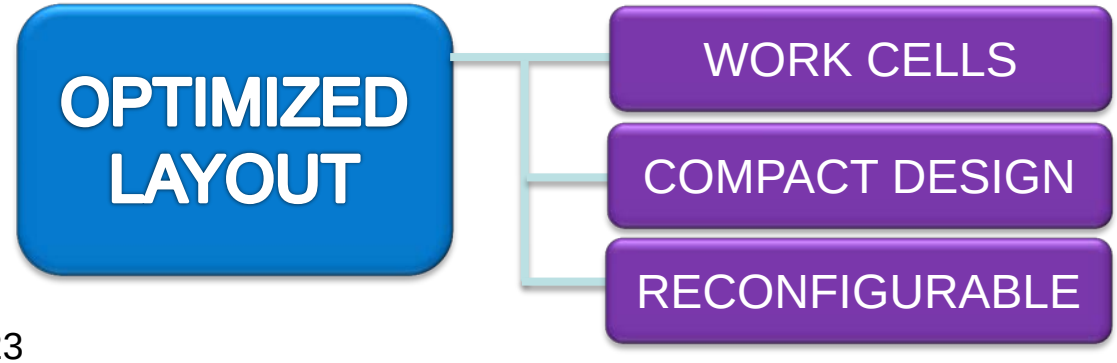
Lean Automation

- Automation can facilitate Lean
- The right automation can reduce the need for manual intervention
- Important part of a Lean Work Cell
- The right automation can also reduce the benefits of tracks

Lean Automation

AUTOMATION IS 'LEAN' IF IT IMPROVES:

AND SUPPORTS:



Total Laboratory Automation

- TLA can bring together some or all of the core lab testing functions
- Connectivity to pre and post-analytical is a key characteristic
- Can produce standardized and consistent results
- Addresses a primary issue in labs - labor

TLA Benefits

Benefit / Outcome	Traditional Lab	TLA
Improved TAT		◉
Productivity of Staff		◉
Utilization of Equipment		◉
Space Utilization		◉
Standardized Work / Quality		◉
Improved Communication		◉

◉ = Advantage ○ = Partial

Automated Work Cells

- Automated work cells typically link one testing area of the core lab
  - Chemistry/IA connected with pre and post-analytics or Hematology work cells
- May require several solutions to improve all core testing areas
- Some Immunochemistry integrated systems have reduced the importance of these work cells
- We'll talk more about TLA

TLA Set-up

According to a 2011 study published by the American Society for Clinical Pathology (ASCP), 43 percent of clinical laboratories surveyed said it is difficult to find personnel.[1]

- This is nothing new, but labor concerns set-up laboratory automation well

1.http://www.mddionline.com/article/us-healthcare-time-right-laboratory-automation

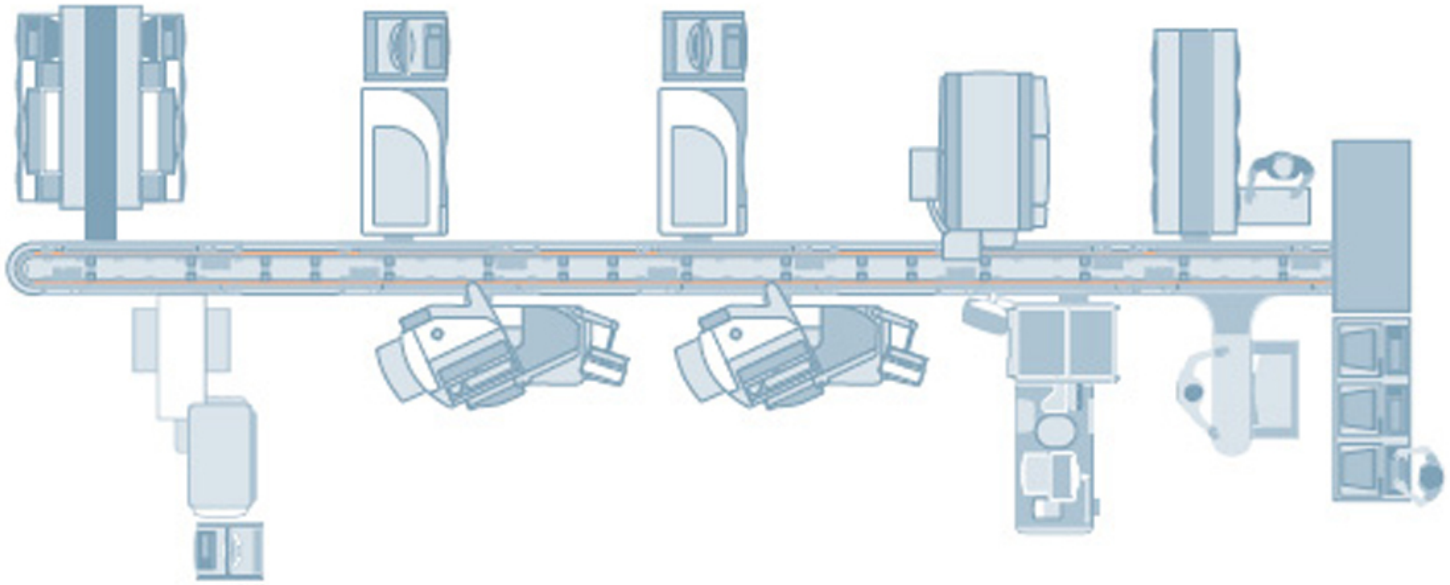
TLA Example

Here is one of several examples we could look at:

ADVIA Solutions

- High-throughput lab automation with broad menu, single LIS connection, flexible configurations and ability to connect multiple disciplines with same track system: (chemistry, immunoassay, hematology, coagulation, urine)[2]

TLA Example



TLA

- Many options
- Several companies offer true TLA
- Many others still offer work cells
- Integrated systems can be important
- Pre and post a key part of the package

Assessment: Lean Work Cell

Benefits:

- Can experience excellent TAT
- Improve labor utilization (removes NVA)
- Improves employee satisfaction
- Optimize laboratory space
- Can provide a good return on investment
- Facilitates a culture of continuous improvement
- Flexible and scalable, easy to change
- Procedures can be simple, visual controls and mistake-proofing – standardized work

Assessment: Lean Work Cell

Must Consider:

- Will take a commitment to Lean
- Commitment for implementation and sustaining
- Require buy-in from staff
- Designed to be easy and mistake-proof, but there is still the human factor – staff could deviate from standard work
- In some cases, highly specialized people don't care for standardized work (can be a benefit)

Assessment: TLA

Benefits:

- Brings everything together: pre, post and core analytical (work cell mentality)
- Can reduce training requirements
- Help with staff issues
- Can reduce decision making
- Could be considered a turnkey product
- Consistent output – predictable TAT
- Standardization and quality

Assessment: TLA

Must Consider:

- Can be costly, capital commitment
- Space requirements – could have large footprint
- Barrier to movement in the lab
- Weaker systems may bottleneck – must properly spec – must be robust
- Integrated systems could reduce benefits of track
- Stand-alone pre-analytics may bottleneck
- Scalable, but cost and space may be an issue

Head-to-Head

Benefit	Lean Work Cell	TLA
Flexibility	◉	
Cost	◉	
Space Utilization	◉	
Turnkey & Self-Managed		◉
Supports Multiple Vendors	◉	
Improves TAT	◉	◉
Labor Utilization	◉	◉
Sustainable Performance	○	◉
Addresses Human Factors		◉

◉ = Advantage ○ = Partial

Final Thoughts

When making decisions for your lab:

- Understand the entire value-stream
- What is your baseline?
- What are your real needs?
- Define your goals and objectives
  - what is the end-game?
- Determine your level of commitment
  - e.g. if Lean is right for you are you ready to see it through to the end

Training Thoughts

Remember…

“Learning is not compulsory, neither is survival”

- W. Edwards Deming

End of presentation

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