Intermountain Health

JTG

Standardizing and Automating Chemistry Lab Testing Across 27 Laboratory Sites to Shorten Time-to-Answer, Reduce Staff Touches, and Improve Service to Physicians

Executive War College

April 30 – May 1, 2024

Agenda and Objectives

- Introductions and disclosures
- Background
- Early decisions and goals
- Implementation
- Metrics
- Lessons learned
- Next steps

Introductions and Disclosures

Dan Anderson, MS, MT (ASCP)

Clinical Pathology Lab Manager
Intermountain Health

https://claudewalrath.wordpress.com/2015/05/22/blogging-challenge-13-the-flash/

- Clinical Pathology Manager at Intermountain Health Central Laboratory in Salt Lake City, UT
- Experience managing different labs with 20+ years of experience in laboratory medicine.
- Quality first, then everything else
- Flash:
  - Speed, Agility, Empathy
- No conflicts of interest

JAMEL GIUMA

President and CEO
JTG Consulting Group

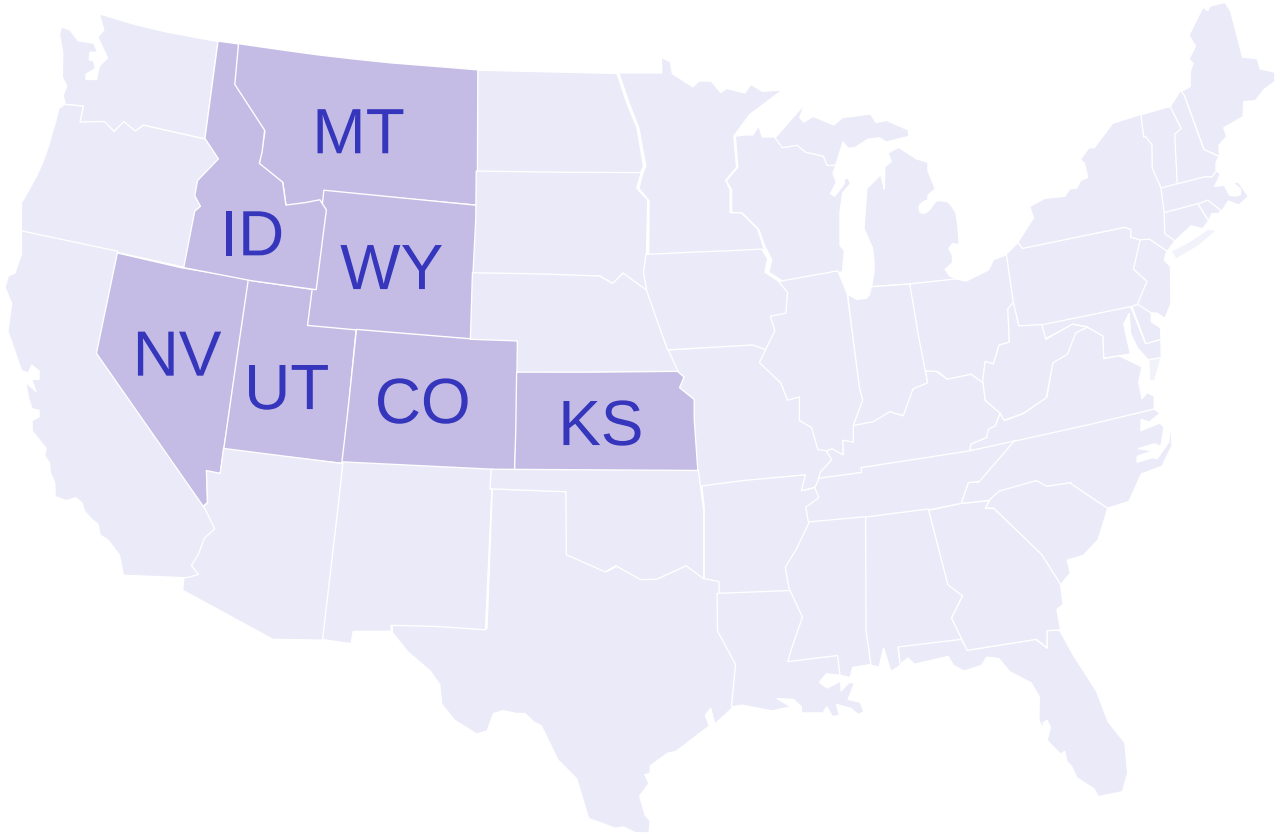
Leonardo – Teenage Mutant Ninja Turtles

- Over 17 years of Laboratory IT Experience
- “Lab IT Ninja” – Dr. David Reis, UHealth
- Focused interests:
  - Improving patient and provider workflows through interoperability to ensure the best patient care outcomes
  - Working with Providers, Customers, Software and Instrument Vendors, Public Health Agencies, Reference Laboratories
- Leonardo:
  - Leader of his brothers, mature, focused, and disciplined

Background

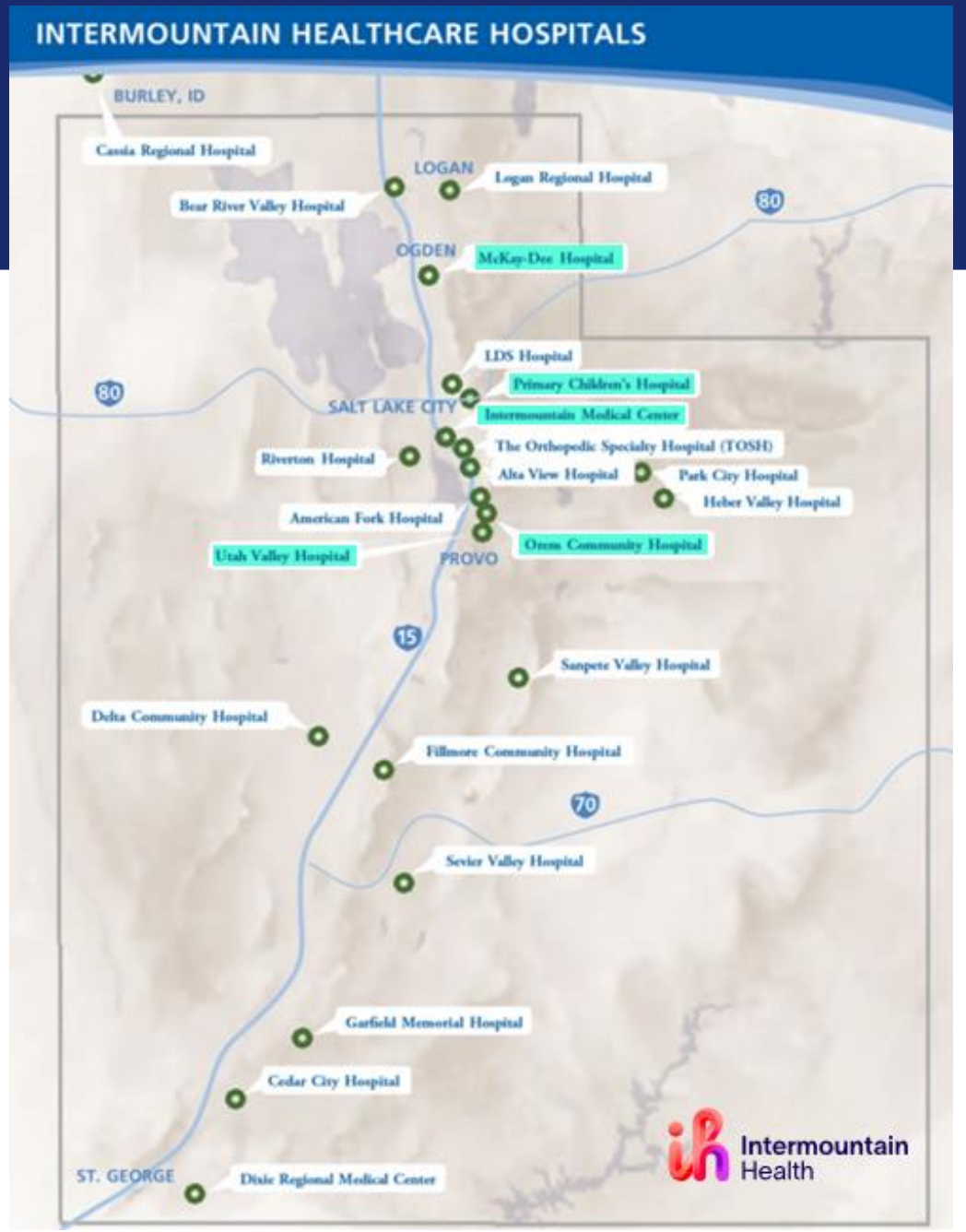
Intermountain Health

- Dedicated to creating healthier communities and helping our patients thrive
- The largest nonprofit health system in the Intermountain West
- We serve patients and communities across 7 states



Utah Hospitals

- Intermountain Medical Center
  - Central lab
- Over 20 other hospitals



Laboratory Services

- Rural, hospital, draw sites, mobile phlebotomy and large core labs
- Standardized system
- Best practice work groups
- Fulfillment center and onsite supply storage

Early Decisions and Goals

Start With Why

Source: clarityspace.co.uk

Change is painful, but nothing is as painful as staying stuck somewhere you don’t belong.

-Mandy Hale

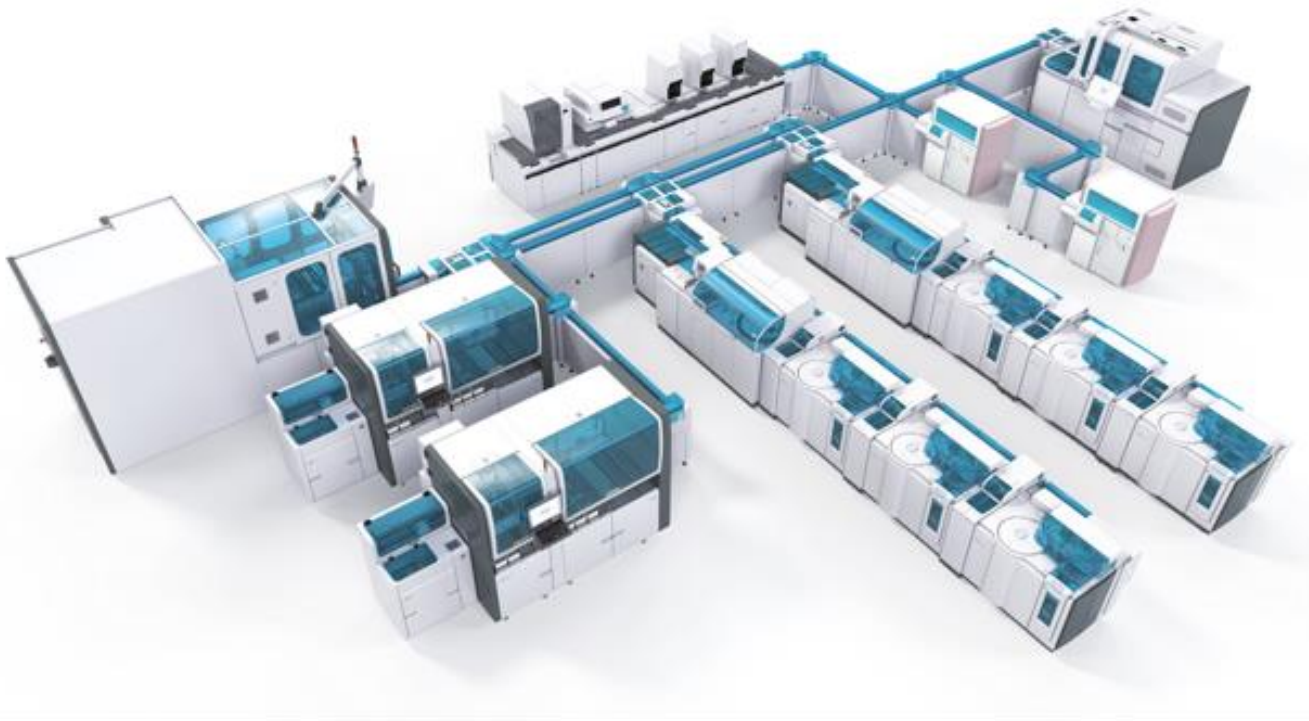
Previous state: End of contract with aging equipment.

Evaluate internally

Discover possibilities

Decisions

- Evaluate major chemistry analyzers
- Decisions would be made at the system level
- Middleware <> LIS integration capabilities



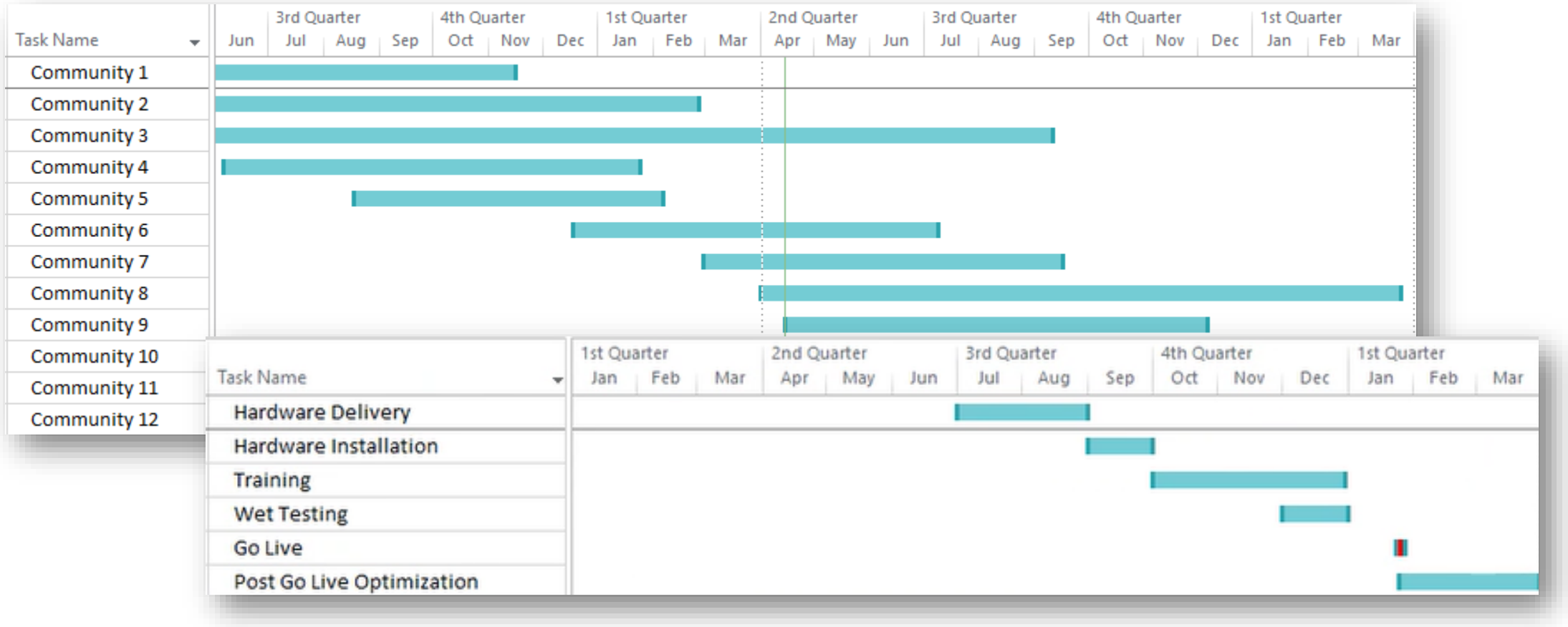
Goals

How do we define success?

- Clinical needs
  - Turnaround times
  - Offer new tests
  - Minimal disruption
- Workflow
  - Reduce hands on time

Implementation

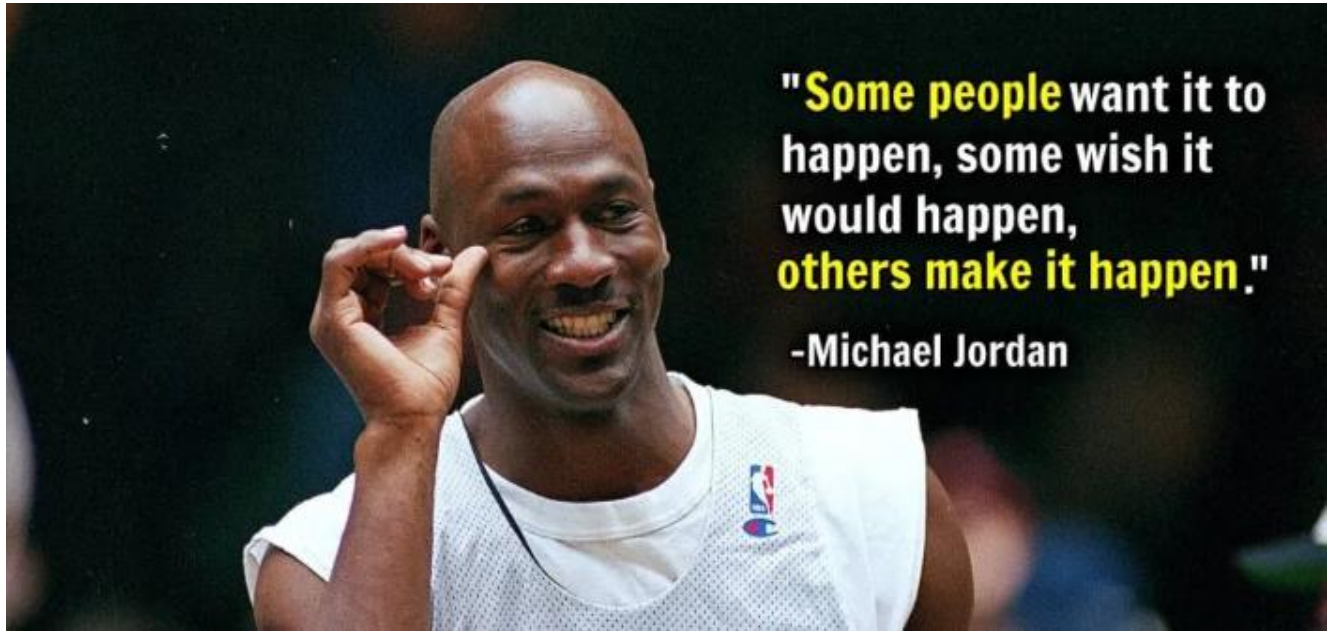
Timeline



Implementation Methodologies

Focus early and often on:

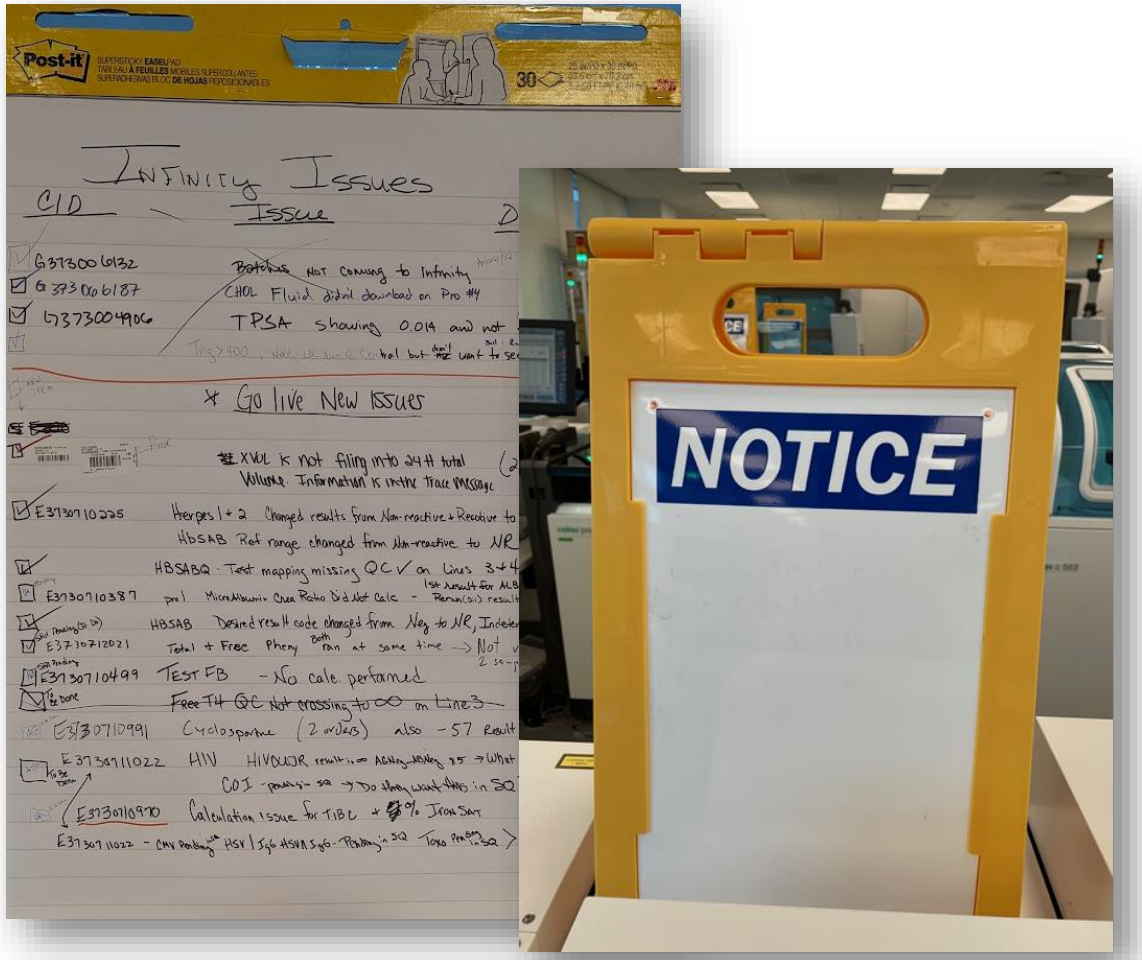
- People
- Process
- Parts



Source: https://goalcast.com

People

- Early adopters? Nay-sayers? Champions?
- Learning and training
  - Standardize training, both internal and vendor.
  - Understand different training speeds.
  - Recognize that on go-live you/they will not be experts.
- Frequent check-ins
- Define expectations



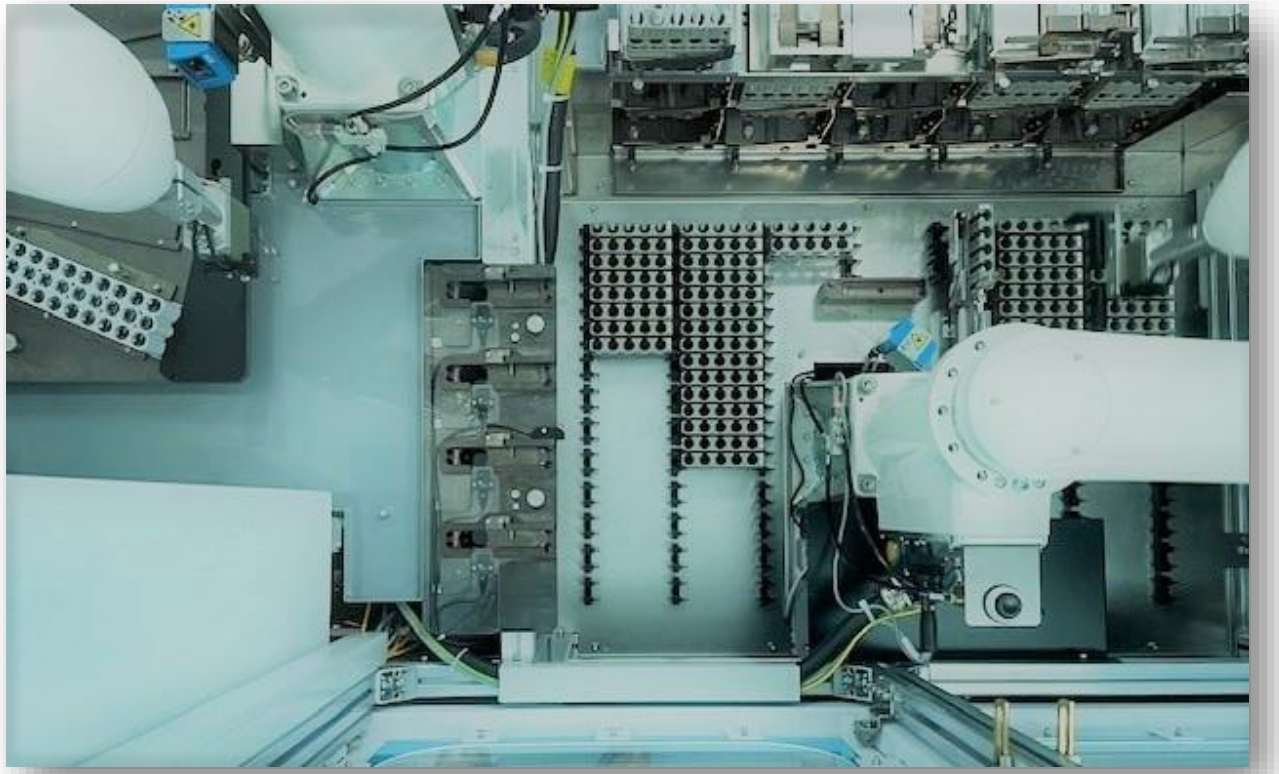
Implementation Phases

- Deming cycle
  - Plan
  - Do
  - Study
  - Act

Source: https://deming.org/explore/pdsa/

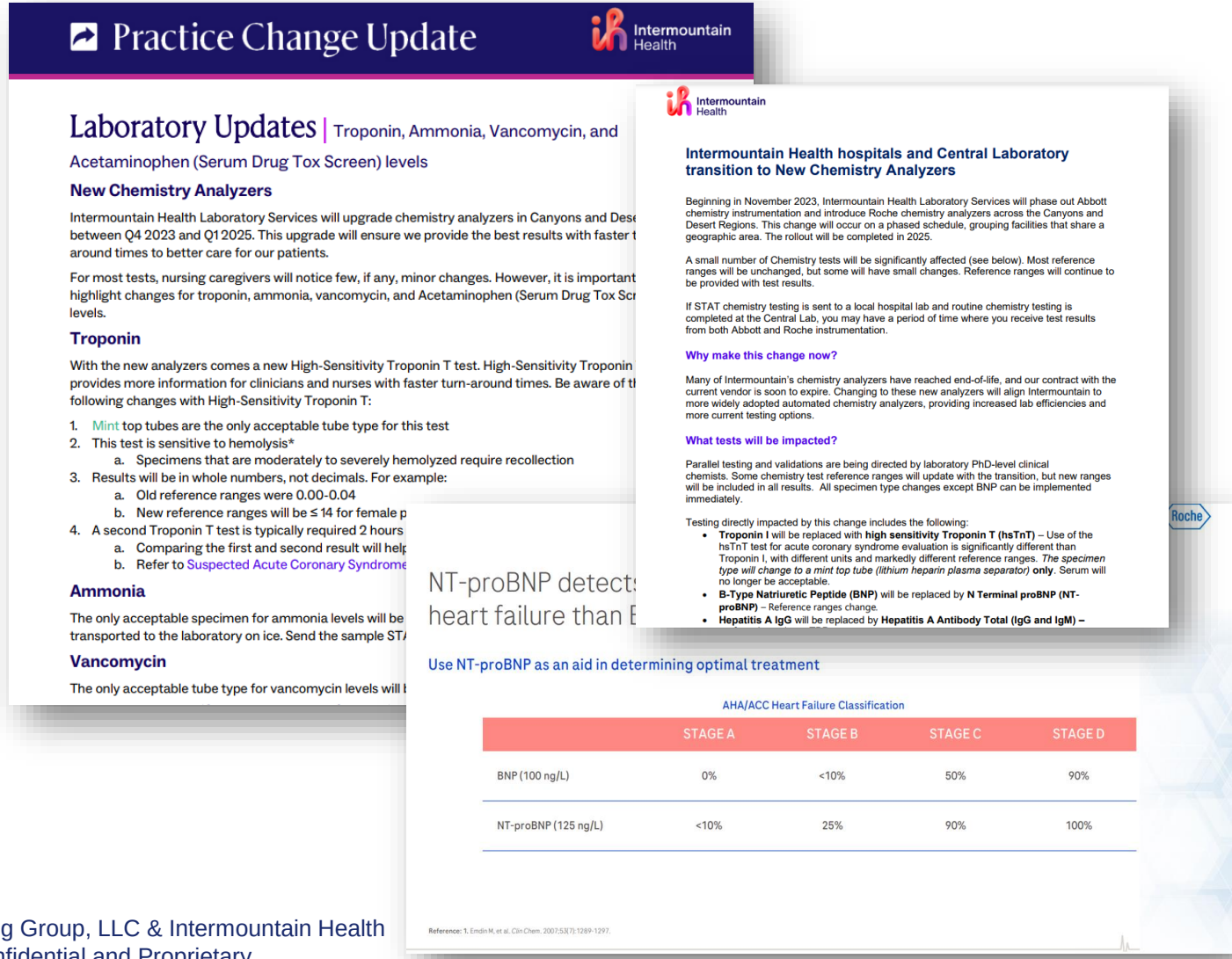
Processes – inside the lab

- Validation
- 5S
- Procedures
  - Standard works
  - Laboratory test directory
  - Supportive documents (Collection guidelines, test interpretations)



Processes – Outside the Lab

- Engage Quality, Education and lab director(s) early
- Understand the impacts outside of the lab
  - Critical timing areas (ED, (N)ICU, Infusion, etc.)
  - Specimen collection
  - Result interpretation



Practice Change Update

Intermountain Health

Laboratory Updates | Troponin, Ammonia, Vancomycin, and Acetaminophen (Serum Drug Tox Screen) levels

New Chemistry Analyzers

Intermountain Health Laboratory Services will upgrade chemistry analyzers in Canyons and Dese between Q4 2023 and Q1 2025. This upgrade will ensure we provide the best results with faster t around times to better care for our patients.

For most tests, nursing caregivers will notice few, if any, minor changes. However, it is important highlight changes for troponin, ammonia, vancomycin, and Acetaminophen (Serum Drug Tox Scr levels.

Troponin

With the new analyzers comes a new High-Sensitivity Troponin T test. High-Sensitivity Troponin provides more information for clinicians and nurses with faster turn-around times. Be aware of t following changes with High-Sensitivity Troponin T:

1. Mint top tubes are the only acceptable tube type for this test
2. This test is sensitive to hemolysis*
   a. Specimens that are moderately to severely hemolyzed require recollection
3. Results will be in whole numbers, not decimals. For example:
   a. Old reference ranges were 0.00-0.04
   b. New reference ranges will be ≤ 14 for female p
4. A second Troponin T test is typically required 2 hours
   a. Comparing the first and second result will help
   b. Refer to Suspected Acute Coronary Syndrome

Ammonia

The only acceptable specimen for ammonia levels will be transported to the laboratory on ice. Send the sample STA

Vancomycin

The only acceptable tube type for vancomycin levels will

Intermountain Health

Intermountain Health hospitals and Central Laboratory transition to New Chemistry Analyzers

Beginning in November 2023, Intermountain Health Laboratory Services will phase out Abbott chemistry instrumentation and introduce Roche chemistry analyzers across the Canyons and Desert Regions. This change will occur on a phased schedule, grouping facilities that share a geographic area. The rollout will be completed in 2025.

A small number of Chemistry tests will be significantly affected (see below). Most reference ranges will be unchanged, but some will have small changes. Reference ranges will continue to be provided with test results.

If STAT chemistry testing is sent to a local hospital lab and routine chemistry testing is completed at the Central Lab, you may have a period of time where you receive test results from both Abbott and Roche instrumentation.

Why make this change now?

Many of Intermountain's chemistry analyzers have reached end-of-life, and our contract with the current vendor is soon to expire. Changing to these new analyzers will align Intermountain to more widely adopted automated chemistry analyzers, providing increased lab efficiencies and more current testing options.

What tests will be impacted?

Parallel testing and validations are being directed by laboratory PhD-level clinical chemists. Some chemistry test reference ranges will update with the transition, but new ranges will be included in all results. All specimen type changes except BNP can be implemented immediately.

Testing directly impacted by this change includes the following:

- **Troponin I** will be replaced with **high sensitivity Troponin T (hsTnT)** – Use of the hsTnT test for acute coronary syndrome evaluation is significantly different than Troponin I, with different units and markedly different reference ranges. *The specimen type will change to a mint top tube (lithium heparin plasma separator)* **only**. Serum will no longer be acceptable.
- **B-Type Natriuretic Peptide (BNP)** will be replaced by **N Terminal proBNP (NT-proBNP)** – Reference ranges change
- **Hepatitis A IgG** will be replaced by **Hepatitis A Antibody Total (IgG and IgM) –**

Roche

NT-proBNP detects heart failure than B

Use NT-proBNP as an aid in determining optimal treatment

AHA/ACC Heart Failure Classification

	STAGE A	STAGE B	STAGE C	STAGE D
BNP (100 ng/L)	0%	<10%	50%	90%
NT-proBNP (125 ng/L)	<10%	25%	90%	100%

Reference: 1. Emdin M, et al. *Clin Chem.* 2007;53(7):1289-1297.

Processes – Focus on Change Control

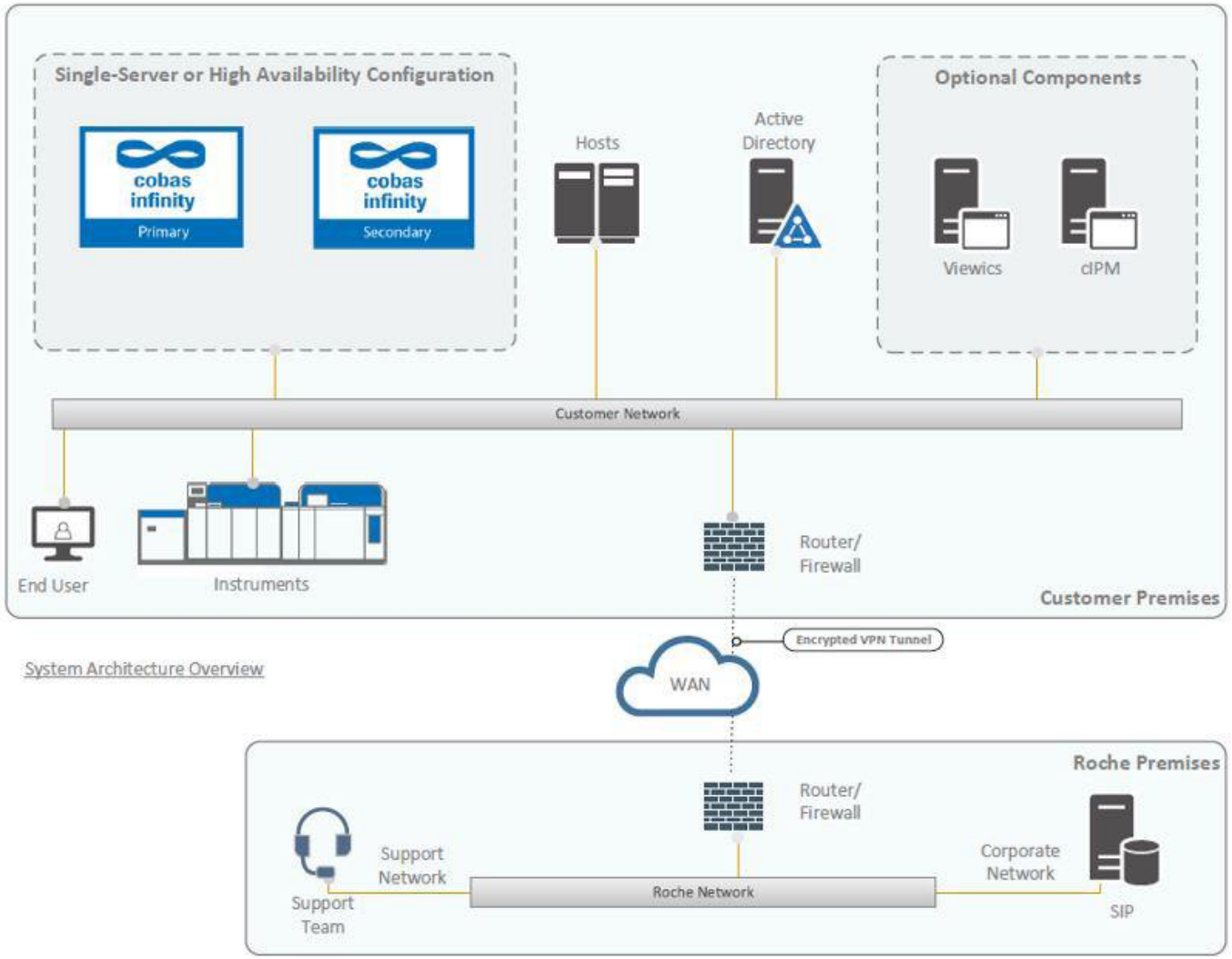
- Scope
- Timeline (and mini-timelines)
- Create a plan, including impacts
- Resources available?
- Obstacles

Process (IT) – Essential for success

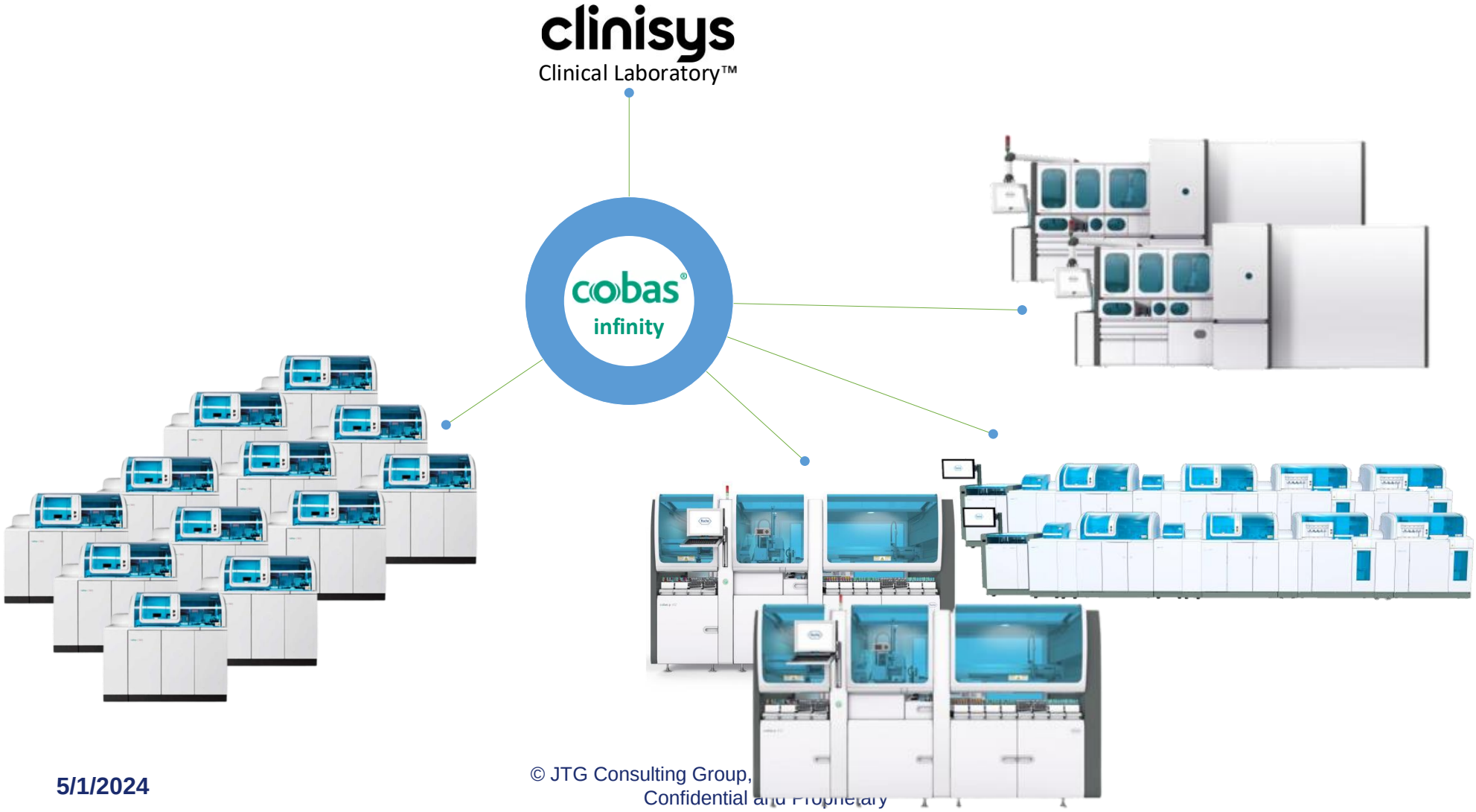
- Clear expectations and requests
- Coordinate between lab IT and vendor IT
- Frequent meetings
- Working sessions
- Validation of LIS rules, calculations and interfaces

Source

System Architecture Overview



Logical Data Flow – Current State



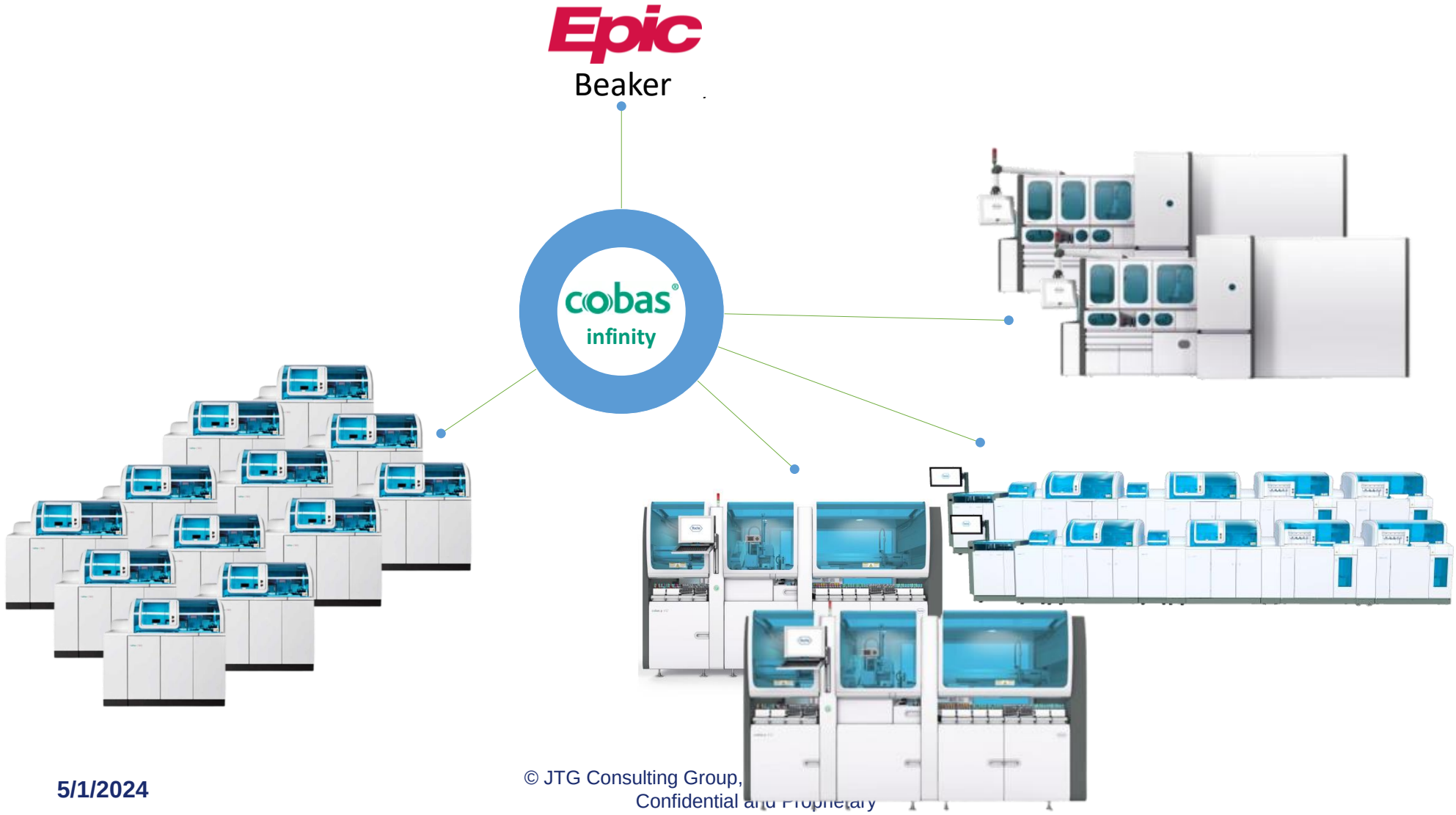
Calculations and Rules

To Calc, or not to Calc, that is the question!

- Evaluation of LIS calculations and middleware rules
- Benefits vs capabilities
- Future proofing/planning
  - Epic Beaker transition

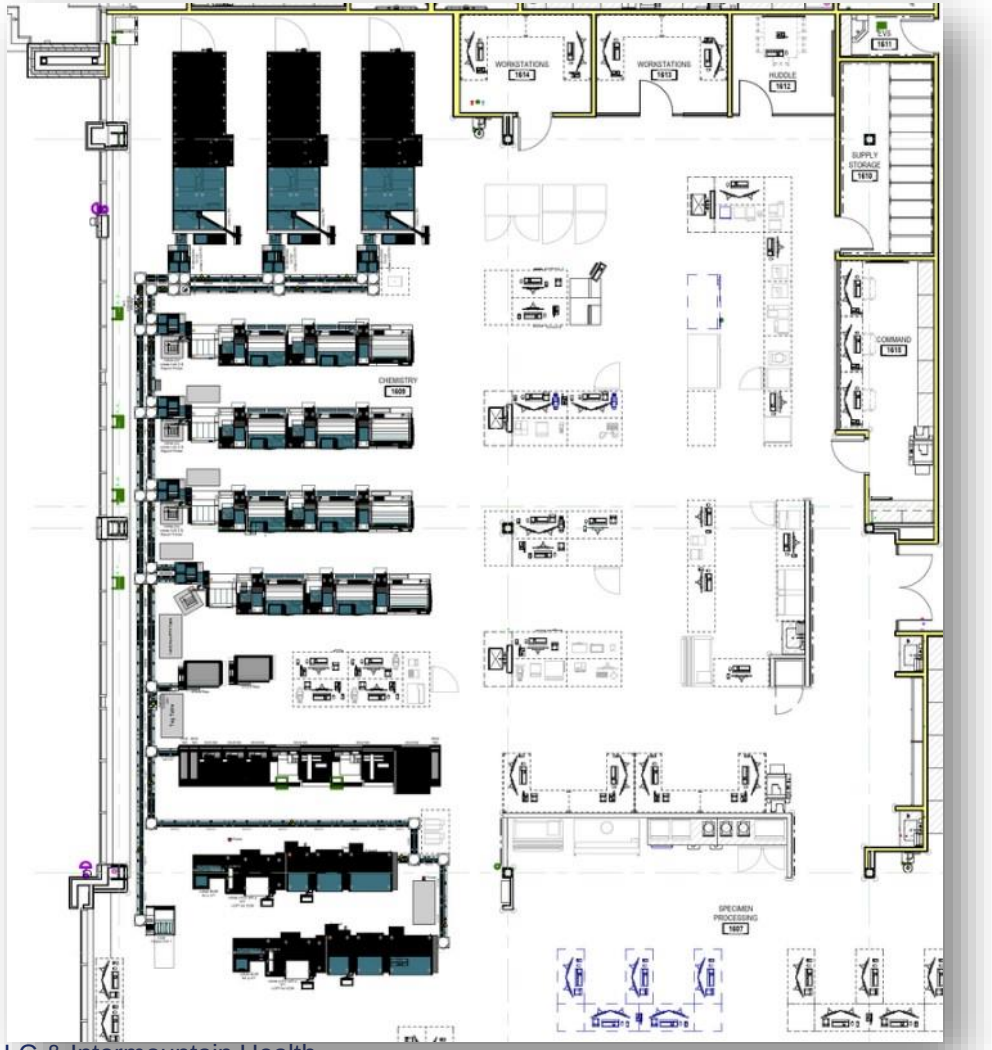
Source: Bored Panda

Logical Data Flow – Future State



Parts - Instruments and Facilities

- Contracts
- Reagents/consumables
- Construction / Facilities
- Validation

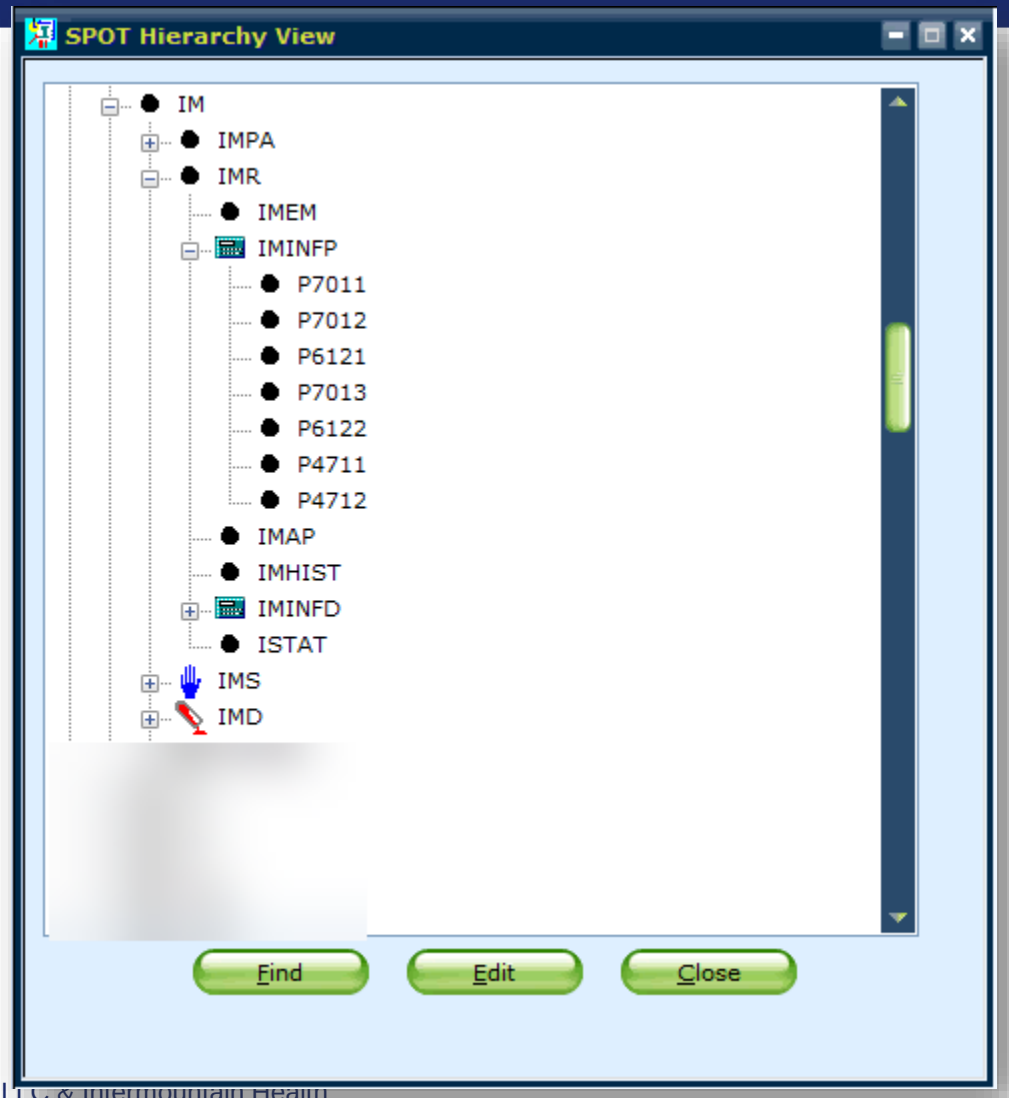


Tempus600® System

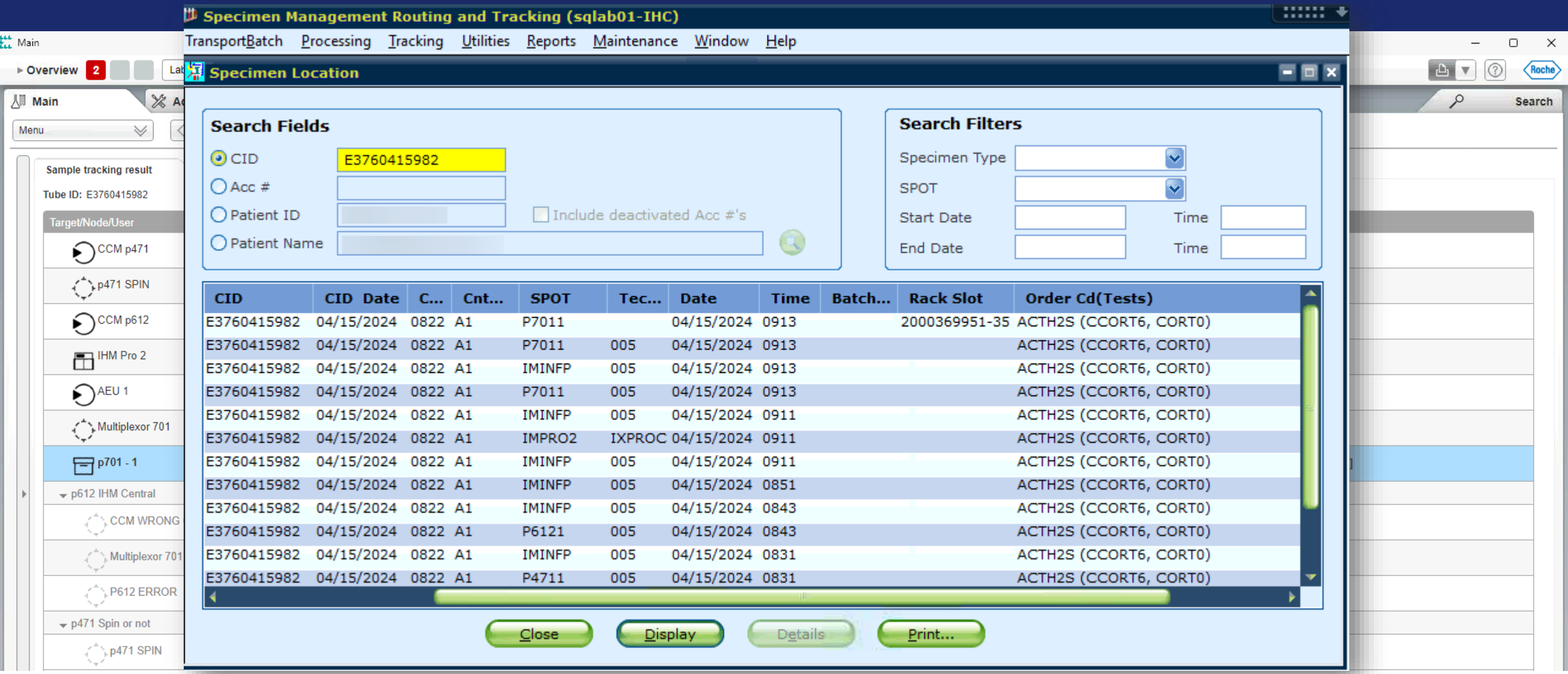
- ED label with automation ready label
- Tube system will deliver directly to preanalytical instrument (BLIM)
  - Reduces TAT by removing a touchpoint
- First in North America

Tempus600® Technical Considerations

- Bypasses specimen processors
  - Download of orders to Roche logic required updating
- Disbanding of batches by Automation Line
- Automatic “Sample Seen” messaging
- Updating Start SPOT maintenance



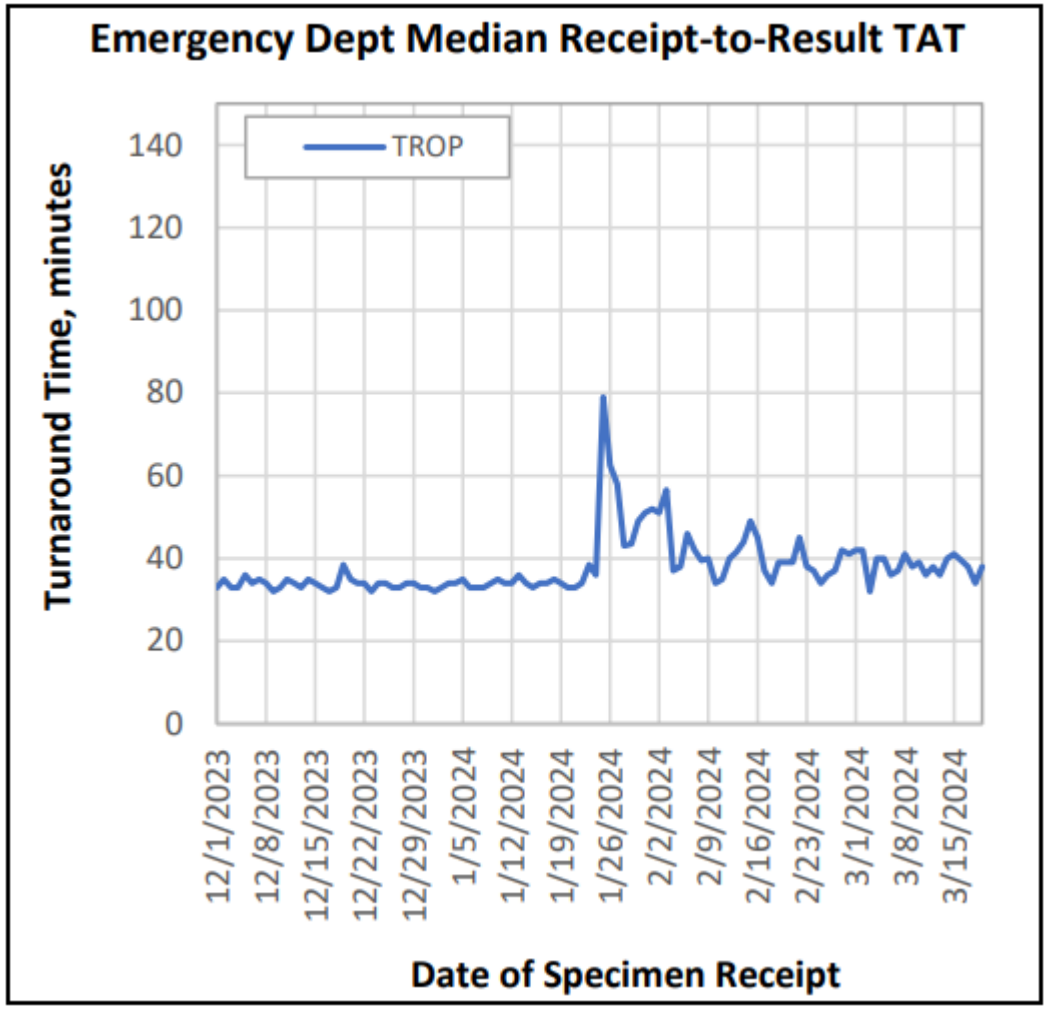
Enhanced Tracking Capabilities



Metrics

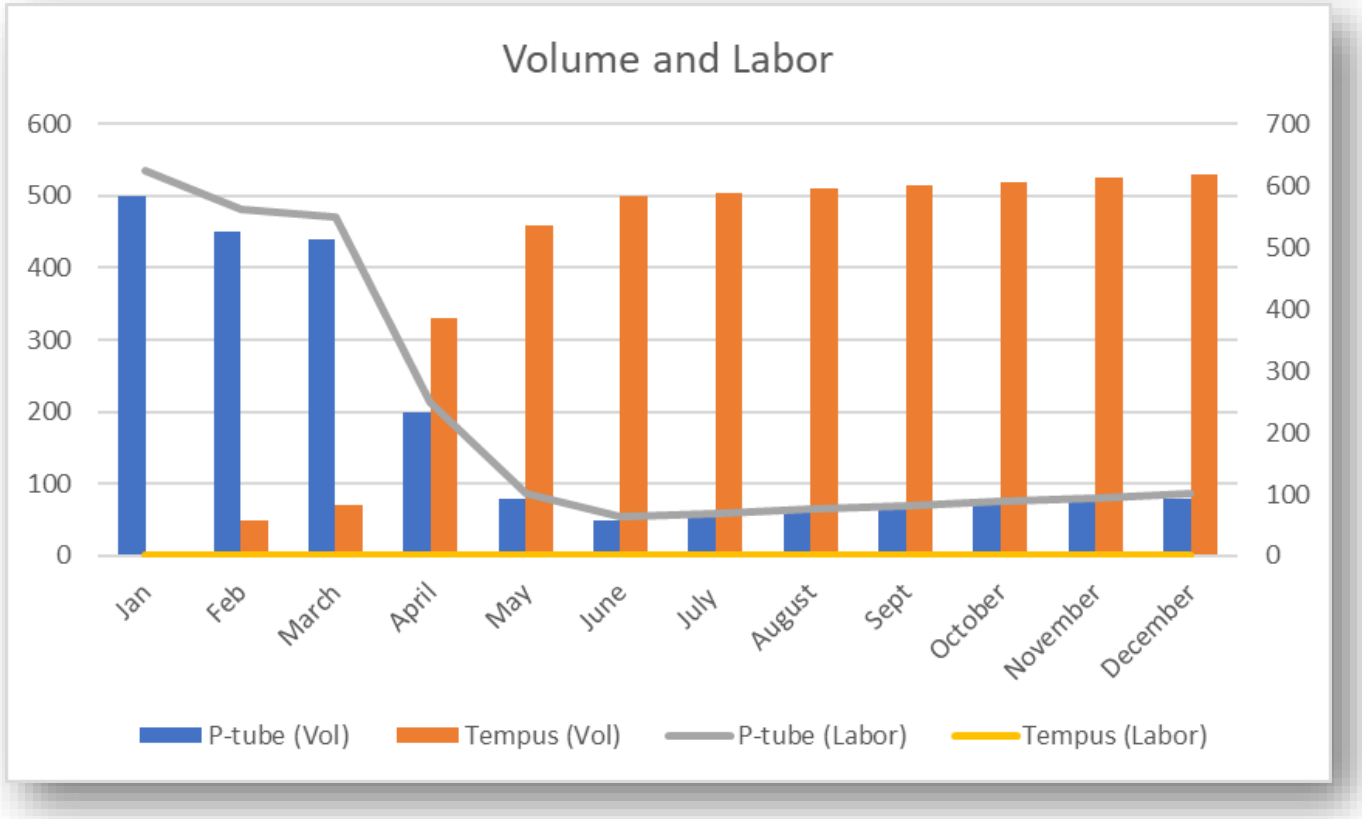
Turnaround time

- Daily review
- By shift
- High impact tests
- By ordering unit (ED, (N)ICU, Infusion)



Hands on time

- Tempus (remove processing time)
- Automation rules (i.e., Additional testing)
- Onboard centrifuge, auto-discard, pulling specimens



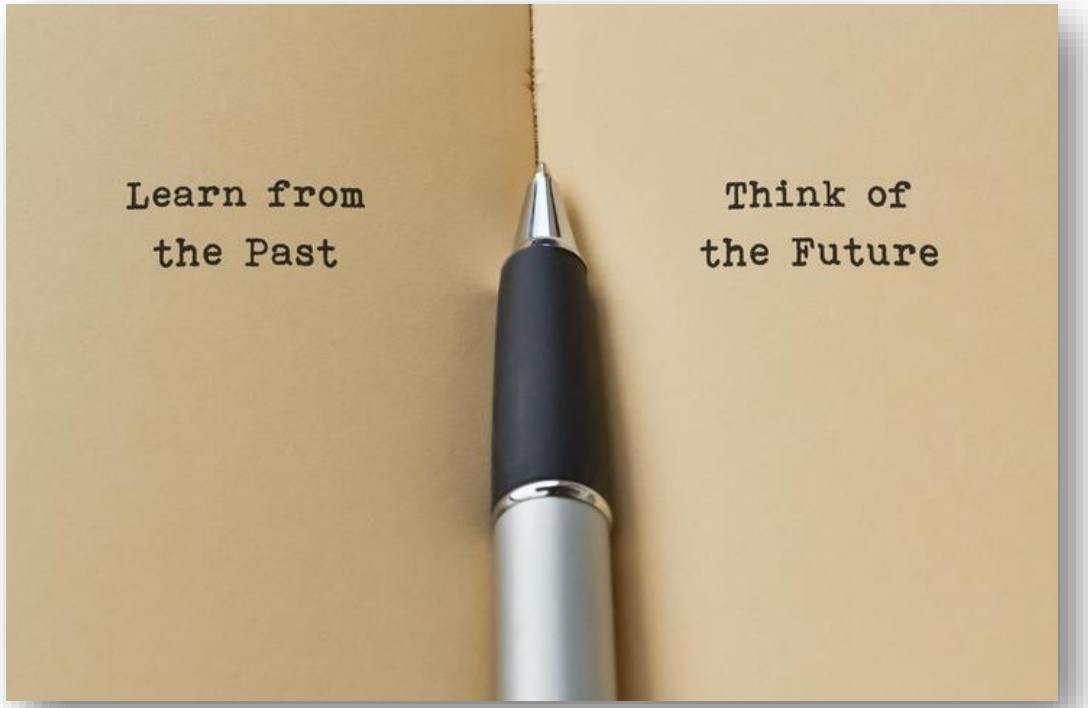
Expenses

- Upfront and ongoing cost
  - Need at least 6 months
- Supply management (deliver schedule)

Lessons Learned

Looking back.....

- What We Did Well
  - Standardization across sites/communities
  - Setup for success in the future with Epic Beaker throughput/workflows
  - Teamwork
  - Partnership
- Improvements
  - Involving QA and other support groups earlier in process
  - Communication to providers




Roche

Next Steps

Next Steps

- Remaining communities
- Continuous improvement (Audit results)
- Optimize integration opportunities
- Epic Beaker transition


?
@
Get in touch!