IU Health Laboratory Services and *Lab Automation's Next Generation*

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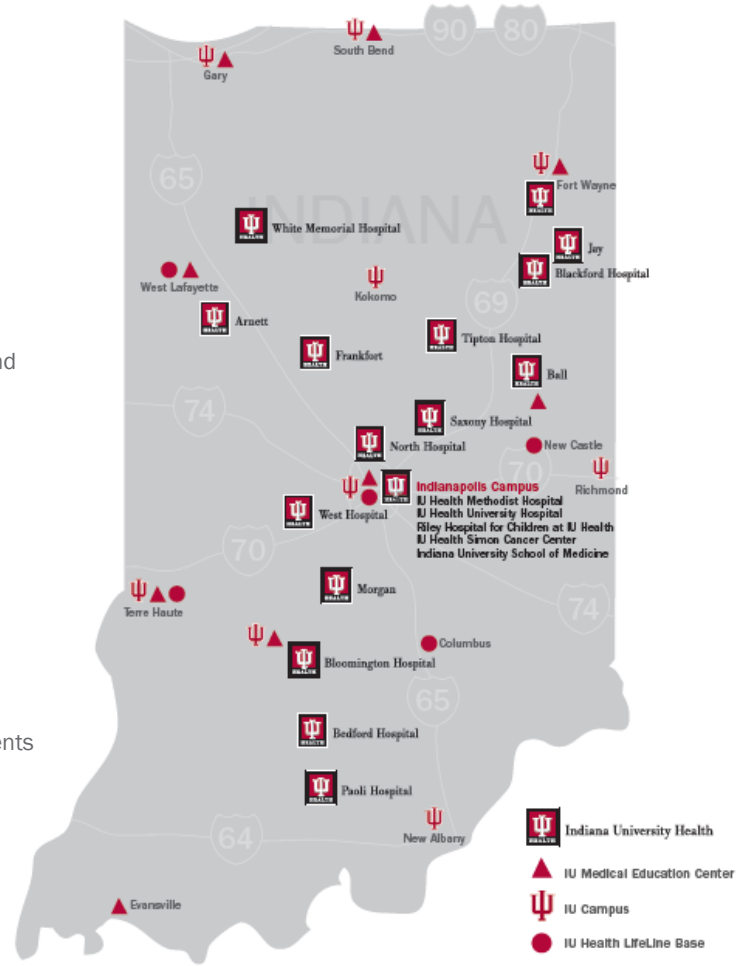
Indiana University Health

Indiana University Health

- Indiana's largest and most comprehensive health system
  - 15 hospitals offering the full spectrum of healthcare services for adults and children
  - More than 300 primary care, specialty care offices and allied services
- One of Indiana's largest employers
  - 38,000+ team members
- Indiana University School of Medicine
  - Unique partnership provides access to leading-edge research and treatments



IU Health: A national leader in healthcare

2.5 million+
OUTPATIENT VISITS

111,689
ADMISSIONS

Nationally Ranked in **10** Pediatric Specialties

Riley Hospital for Children
Indiana University Health

38,079
TEAM MEMBERS

2,354
ACTIVE PHYSICIAN TEAM MEMBERS

$1.5 billion
COMMUNITY BENEFIT & INVESTMENT

2,641
NUMBER OF VOLUNTEERS

IN PARTNERSHIP
INDIANA UNIVERSITY

Medicine | Nursing | Pharmacy
Public Health | Social Work

15
hospitals across Indiana

MAGNET RECOGNIZED
AMERICAN NURSES CREDENTIALING CENTER

7 hospitals have achieved Magnet status—the gold standard for nursing excellence.

PATHWAY DESIGNATED
AMERICAN NURSES CREDENTIALING CENTER

9 facilities have achieved Pathway to Excellence Designation—providing the very best patient care.

IU HEALTH

IU Health Pathology Laboratory Services

Network of laboratories

- Centralized state-of-the-art facility in downtown Indianapolis, IN
- Regional laboratories
  - Hub and regional hospitals (5)
  - Critical access hospitals (10)

24+ million billed tests per year

Extensive outreach service as a regional reference lab

Specialized team

- 1,100+ team members
- 40+ outpatient service centers
- 100+ medical directors, pathologists and faculty

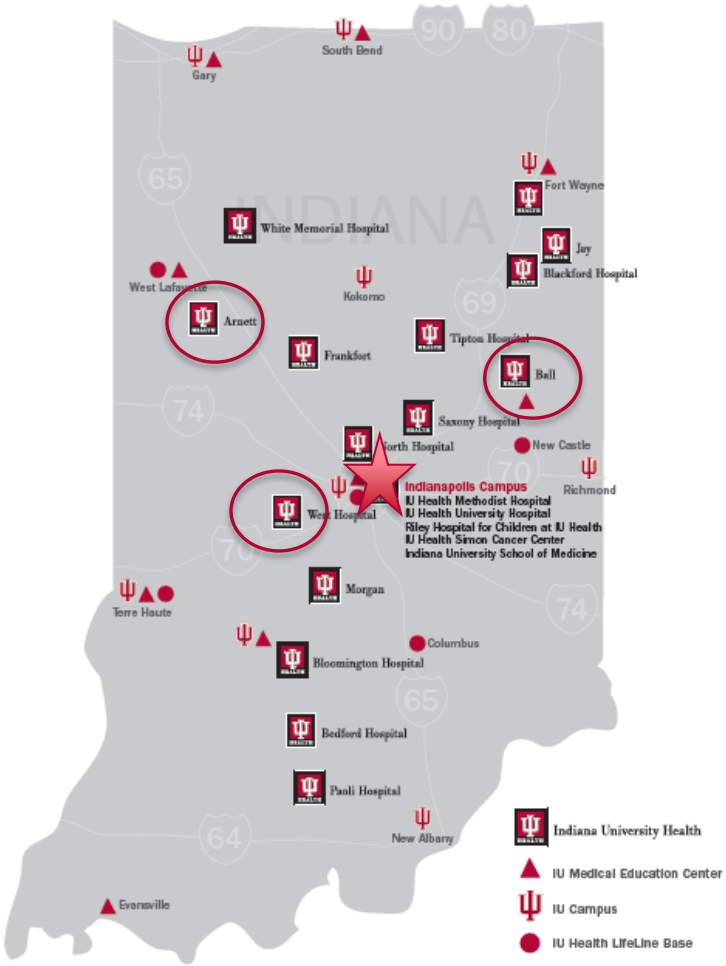
Hub Geography

IU Health Arnett
West Lafayette, IN

IU Health Ball Memorial
Muncie, IN

IU Health West
Avon, IN

IU Health Pathology Lab (Reference Lab)
Indianapolis, IN



Why Choose Next-Gen Automation?
-Today's Problems Need Today's Solutions!

- Business is Changing
  - High hospital patient census
  - Test volume increasing (internal and external)
- Financial Pressures
  - Annual challenge to reduce spend
  - Lower cost per test
- Staffing Challenges
  - Base salary and starting wage increases
  - Wage compression
  - Workforce shortages

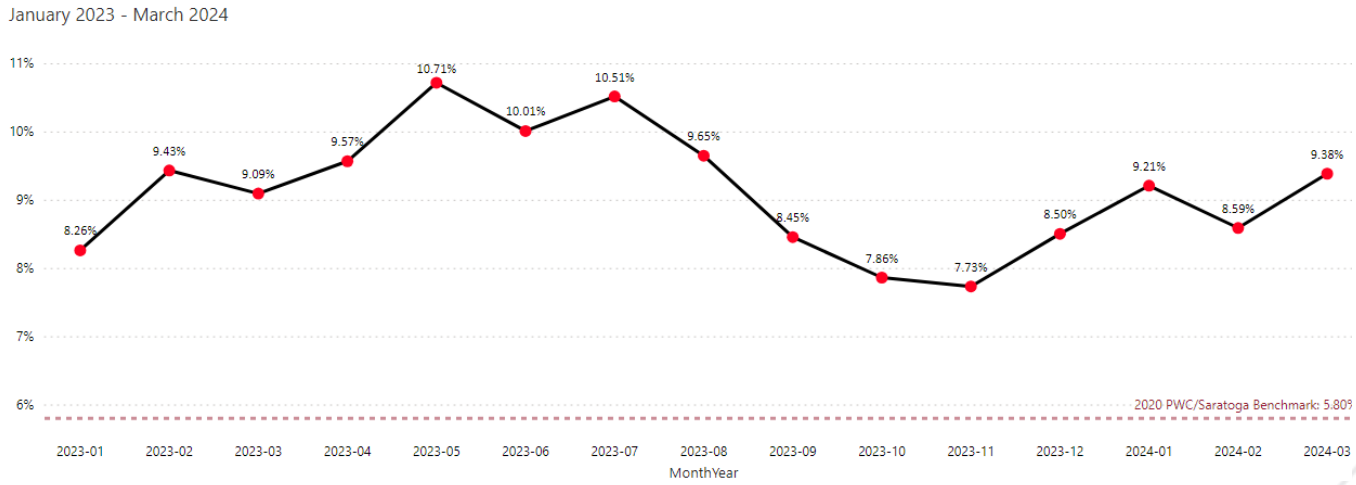
State of the Laboratory Team

Aging and Strained Team

- 41 years average age, 8% are age 65+
- Averaging 32.5 FTEs of overtime per pay period system wide.

Job Openings and Opportunities

- 9.38% vacancy
- 41 days to fill (avg)
- 125 open reqs, with 14 reqs >120 days



What Solutions Can a Lab Consider?

Manage Demand (Volume)

- Reduced staff
  - *Coverage issues*
  - *Errors and omissions*
  - *Stat workflow process*
- Simplify the menu
  - *More send-out or POC testing*
    - *Higher cost*
    - *Slower TAT*
    - *Quality risk*
- Increase TAT expectations
  - *Customer experience suffers*

Improve "Supply" (Capability)

- Shorten **TAT**
  - *High throughput / high capacity*
  - *Dedicated stat workflow*
- Reduce **errors** and rework
  - *60% hours in pre-analytical*
    - *75% errors*
- Enhance staff **productivity**
  - *Reduce steps*
  - *Lean, efficient workflow*
- Team engagement & collaboration
  - *Workflow/force versatility*

Revenue risk (less controllable) versus Expense risk (controllable)

Lab Automation Solutions Support the “Supply” Alternative

Top 3 Reasons Labs Seek Automation[1]

- Improve STAT turn-around times
  - DxA gives STAT tubes continuous priority
  - 4-minute centrifugation
- Reduce errors & standardize process

1. Read the barcode label
2. Measure sample tube size
3. Identify container type
4. Identify container cap type
5. Identify container cap color
6. Measure the fill level
7. Measure sample volume
8. Calculate sample weight
9. Conducts pre-spun status check[1]

- Improve productivity
  - Handle more specimens with less or the same FTE

[1]Laboratory Automation Marketing Monitor Report (LAMM), 2018

A Comprehensive Solution to Achieve Significant Improvement

Automation integrates multiple diagnostic specialties to one single track to improve efficiency, organization, standardization, quality and safety of laboratory testing[2]

More than

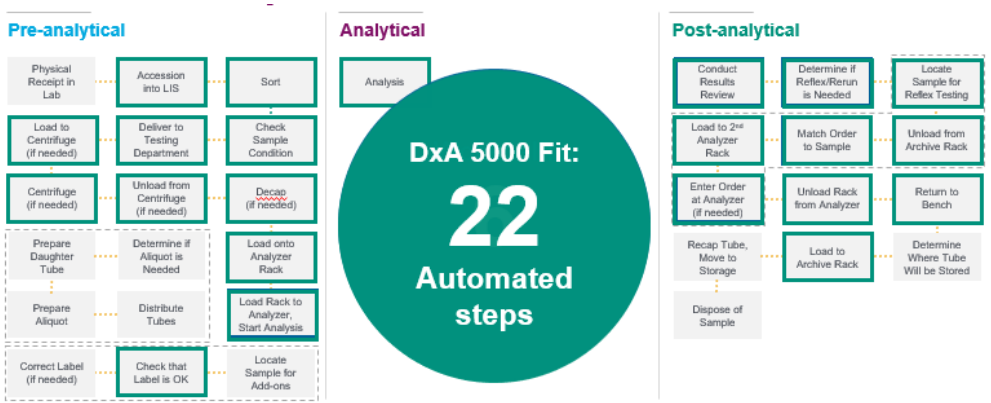
90%

of workflow steps occur pre- / post-analysis[3]

About

75%

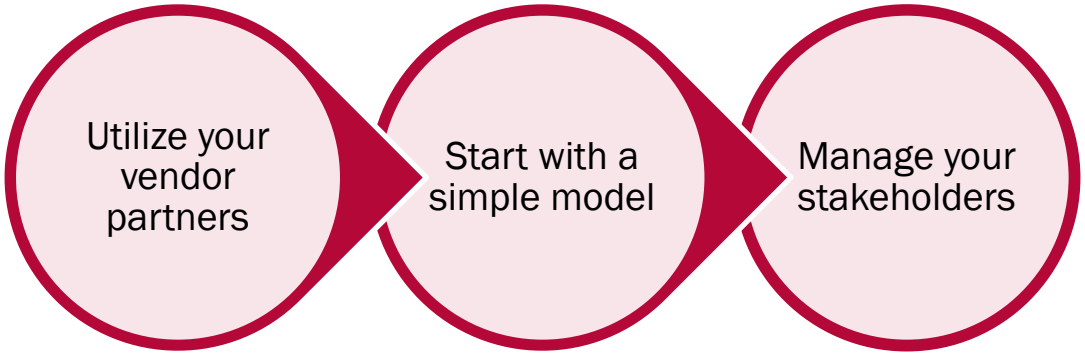
of result errors trace to pre-analytical mistakes[3]



Beckman Coulter DxA 5000 Fit Automates 70% of Manual Workflow

[2] Lippi, Giuseppe and Da Rin, Giorgio. "Advantages and limitations of total laboratory automation: a personal overview" Clinical Chemistry and Laboratory Medicine (CCLM), vol. 57, no. 6, 2019
[3] A Review of Medical Errors in Laboratory Diagnostics and Where We Are Today. https://academic.oup.com/labmed/article/43/2/41/2505001

Building the Business Case



Next Generation Automation Candidates at IU Health

IU Health Arnett Hospital

- 130 Patient Census
- 850,000 Billable Tests
- 40.09 FTEs

IU Health Ball Memorial Hospital

- 230 Patient Census
- 860,000 Billable Tests
- 49.96 FTEs

IU Health West Hospital

- 175 Patient Census
- 470,000 Billable Tests
- 25.82 FTEs

Region Labs Compared to Central Core Automated Laboratory

KPIs	Central Core	Arnett	Ball	West
Test Volume	3.8M	0.9M	0.9M	0.5M
FTE	79.51	40.09	49.96	25.82
Productivity	0.04	0.10	0.12	0.11

Could a midsize lab's productivity approach that of the core laboratory?

Initial Investment Analysis Example

IU Health Arnett Hospital

Current	Med Tech	Processors	Total
FTE	9.4	5.0	14.4
Rate	$ 37	$ 29	
Total ($000)	$ 726	$ 306	$ 1,032
Future State Automation			
FTE	7.0	4.5	11.5
Rate	$ 41	$ 33	
Total ($000)	$ 597	$ 304	$ 901
Annual Savings			
FTE	(2.4)	(0.5)	(2.9)
Rate	$ 41	$ 33	
Save ($000)	**($205)**	**($34)**	**($238)**
Automation Investment ($000)			**$700**
Investment Multiplier		2	**$1,400**
Payback Period (Years)			**(5.9)** ✗

IU Health Ball Memorial Hospital

Current	Med Tech	Processors	Total
FTE	12.8	9.8	22.6
Rate	$ 37	$ 29	
Total ($000)	$ 988	$ 600	$ 1,588
Future State Automation			
FTE	7.0	5.5	12.5
Rate	$ 41	$ 33	
Total ($000)	$ 597	$ 372	$ 969
Annual Savings			
FTE	(5.8)	(4.3)	(10.1)
Rate	$ 41	$ 33	
Save ($000)	**($494)**	**($291)**	**($785)**
Automation Investment ($000)			**$1,400**
Investment Multiplier		2	**$2,800**
Payback Period (Years)			**(3.6)** ✓

Indiana average salary rates (2019) with +28% benefits. Assumed 2% CPI over 5 years for Future State.
Automation investment covers more than hardware and is illustrative.

Other Factors to Consider: Assign a Financial Benefit Where Possible

The Customer Experience

- Consistent, reliable turn-around time

Team Member Engagement

- Improve retention

Productivity

- Cost per test (SWB/Test vs OpEx/Test)

Error Reduction

- Patient impact & team member time

What is the "right thing to do" to do for your health system or laboratory?

A Case Study: IU Health Ball and Beckman Coulter Core Lab Automation

- October 2022: IU Health Ball Memorial Hospital is first IU Health laboratory to install next generation automation
  - Processing
  - IA
  - Chemistry
  - Hematology
  - Coagulation
  - Storage
- Installation
  - October 2022-Dec 2022
  - Existing equipment was factored into the design and moved prior to installation
- Go-Live
  - December 2022
  - Very little work required to launch
    - Platelet poor plasma validation
    - IS testing

A Case Study: IU Health Ball and Beckman Coulter Core Lab Automation

A Case Study: IU Health Ball and Beckman Coulter Core Lab Automation

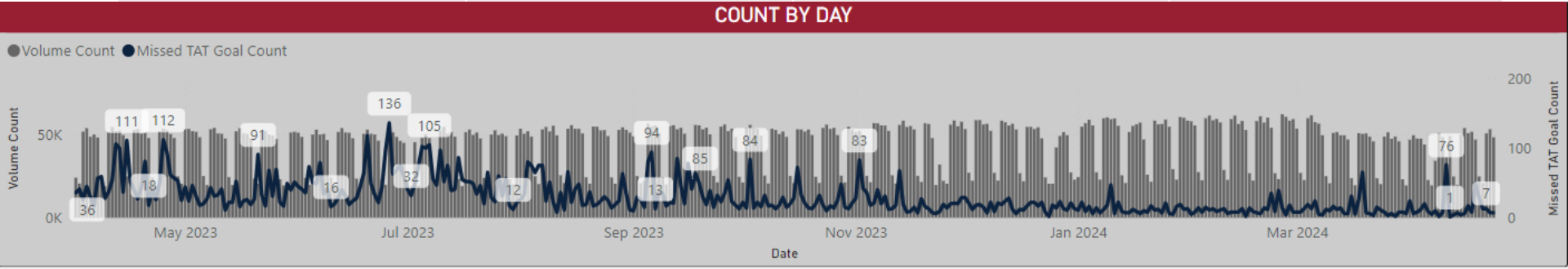
KPIs	2022	2024	Δ
FTE	49.96	41.94	↓8.02 (16%)
Testing Volume	760,000	860,000	↑100,000 (13%)
ED TAT (target 92%)	90.5%	94.3%	↑3.8%
Productivity	0.12	0.02	↓0.10
Team Engagement	2.96 (Gallup)	3.40	↑0.44

Case Study 2: IU Health Methodist Lab

- New, on-site automated laboratory
  - Processing
  - IA/Chemistry
  - Hematology/Coagulation
  - Storage
- Testing was previously performed at off-site laboratory with older generation of automation
  - ED testing was performed in Acute Care STAT lab within ED space.
- Largest hospital in IU Health, with greatest volume
- Required recruitment of many new laboratory scientists and support staff

Case Study 2: IU Health Methodist Lab-Launched June 26, 2023

ED STAT Testing	ED Lab Performance Jan 2023-June 2023	New Lab, Post-automation July 2023-Dec 2023	Post-Automation Jan 2024-April 2024
Count Missed TAT Goal*	7166	5760	1506
% Goal* Met *goal=92% in 60min	89.29%	91.84%	96.69%



Learnings

- Every lab is different, so results will vary!
- ADKAR, ADKAR, ADKAR!
- Be adaptable.
- Rely on your vendor where it makes sense.
- Have fun along the way!

Thank you!

Discussion

Indiana University Health