

Offset Staff Shortages With LIS Integration

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Objectives

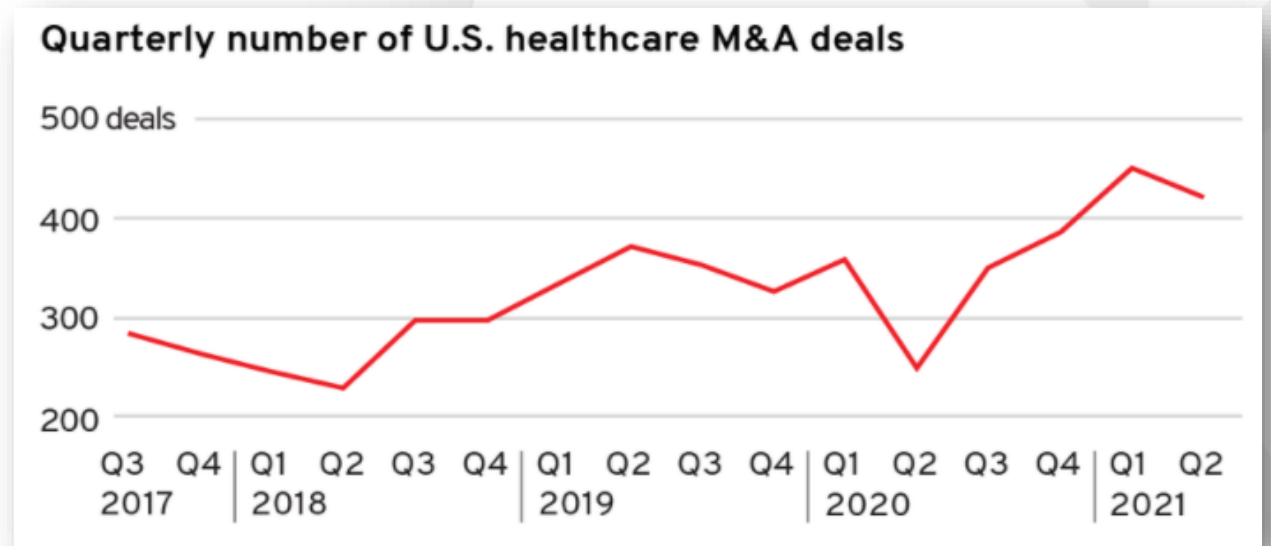
Recognize	trends within the healthcare and laboratory industries that are adding pressure to laboratory professionals' jobs.
Identify	the cost of errors and burnout in the laboratory.
Share	a laboratory case study example that highlights the benefits of an integrated LIS.
Examine	the myriad benefits achieved by integrating your LIS.

Trends in the Healthcare & Laboratory Markets

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Continued Healthcare Consolidation

- Healthcare M&A continue to rise
- Record # in 2021
 - ~ 3,000 deals
 - up > 25% from 2020
- Recent mergers are trending toward “megamergers”



2021 Lab M&A Summary

U.S. Laboratory Acquisition Summary for 2021 (\$ millions)

Date	Buyer	Target	Purchase Price*	Acquired Revenue	Price/Revenue
Pending	Labcorp	Personal Genome Diagnostics (Baltimore, MD)	\$575	\$40	14.4
Jan-22	Exact Sciences	PreventionGenetics (Marshfield, WI)	190	36	5.3
Dec-21	Sonic Healthcare	ProPath (Dallas, TX)	NA	110	NA
Dec-21	Northwest Pathology	Progenity's Avero Diagnostics (Irving, TX)	10.9	40	0.3
Dec-21	Castle Biosciences	Cernostics (Pittsburgh, PA)	80	NA	NA
Dec-21	Quest Diagnostics	Labtech Diagnostics (Anderson, SC)	NA	NA	NA
Nov-21	EKF Diagnostics	Advanced Diagnostic Laboratory (San Antonio, TX)	10	12	0.8
Sep-21	Labcorp	Myriad's Vectra autoimmune testing business (Salt Lake City, UT)	150	35	4.3
Aug-21	Fulgent Genetics	CSI Laboratories (Alpharetta, GA)	52	43E	1.2
Aug-21	ProPhase Labs	Nebula Genomics (San Francisco, CA)	14.6	NA	NA
Aug-21	PathGroup	DermLab (Birmingham, AL)	NA	NA	NA
Aug-21	OPKO/BioReference	Roche's Ariosa U.S. prenatal testing business	NA	NA	NA
Aug-21	Quest Diagnostics	Nationwide Laboratory Services (Boca Raton, FL)	26	NA	NA
Aug-21	Veracyte Inc.	HalloDx (Marseille, France and Richmond, VA)	321	30	10.7
Jul-21	Eurofins Scientific	DNA Diagnostics Center (Fairfield, OH)	NA	55	NA
Jul-21	Labcorp	OmniSeq (Buffalo, NY)	NA	NA	NA
Jul-21	PathAI	Poplar Healthcare (Memphis, TN)	NA	NA	NA
Jun-21	Apollo Medical Holdings	Sun Clinical Laboratories (El Monte, CA)	4	NA	NA
Jun-21	PathGroup	Skin Diagnostics Group (Birmingham, AL)	NA	NA	NA
Jun-21	Quest Diagnostics	Mercy Health clinical lab outreach (AR, KS, MO, OK)	225	NA	NA
May-21	Castle Biosciences	Myriad's MyPath Laboratory (Salt Lake City, UT)	32.5	10E	3.3
Apr-21	Augustus Labs	Evergreen-Sheridan Laboratories (Palos Heights, IL)	NA	NA	NA
Apr-21	Diamed	Interpace Biosciences (Connecticut lab)	NA	NA	NA
Mar-21	Veracyte Inc.	Decipher Biosciences (San Diego, CA)	595	40	14.9
Mar-21	Bio-Techne Corp.	Asuragen (Austin, TX)	320	30	10.7
Mar-21	C2I Genomics	QNA Dx (Cambridge, MA)	NA	NA	NA
Jan-21	ChristianaCare	Delaware Clinical & Laboratory Physicians (Newark, DE)	NA	NA	NA
Totals & Weighted Average**		(all lab deals completed in 2021)	\$2,429	\$855	2.8
Totals & Weighted Average		(excluding next-gen and liquid biopsy labs)	\$1,193	\$755	1.6

*Purchase price includes upfront cash paid plus contingent consideration

**Excludes Labcorp's pending purchase of Personal Genome Diagnostics and Exact Sciences acquisition of PreventionGenetics in January 2022

Source: *Laboratory Economics*

Lab M&A

MERGERS & ACQUISITIONS

Lighthouse Lab Services
Acquires Burns Consulting Group
PathGroup Buys DermLab.....
BioReference Buys
Roche's Ariosa Lab
Testing Business
Quest Buys Nationwide
Lab Services.....

MERGERS & ACQUISITIONS

PathGroup Acquires
Pathology Consultants
Sema4 Pays \$473 Million
To Buy GeneDx

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Castle Biosciences to
Buy Cernostics

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Progenity Sells Lab Business
To Northwest Pathology
Labcorp To Buy PGDX.....
Exact Acquires PreventionGenetics...

MERGERS & ACQUISITIONS

Quest Buys Labtech Diagnostics

Reimbursement Decline

Significant ↓ in payment
for ~ 75% of lab tests
billed to CMS

CMS estimated 1st year
cuts at \$670 million

Some suggest PAMA will
cause more industry
consolidation as the
large reference
laboratories continue to
buy smaller laboratories

Protecting Access to Medicare Act

PAMA Delays

Laboratory Access for Beneficiaries (LAB) Act of 2019

- delayed PAMA reporting until 2021

2020 Coronavirus Aid, Relief, and Economic Security (CARES) Act

- delayed PAMA reporting by another year with a new reporting period of January 1 to March 31, 2022
- capped the 2020 CLFS rates through 2021
- delayed the 15% reduction cap originally planned for 2021-2023 until 2022-2024

Pandemic

Labs pivoted quickly to ramp up
COVID-19 testing

Added new analyzers, methodologies

Addressed supply chain, PPE shortages

COVID's Impact on the Lab

Pros

- Brought some much-needed recognition to the profession



Cons

- Added an enormous amount of pressure to an already short-staffed profession



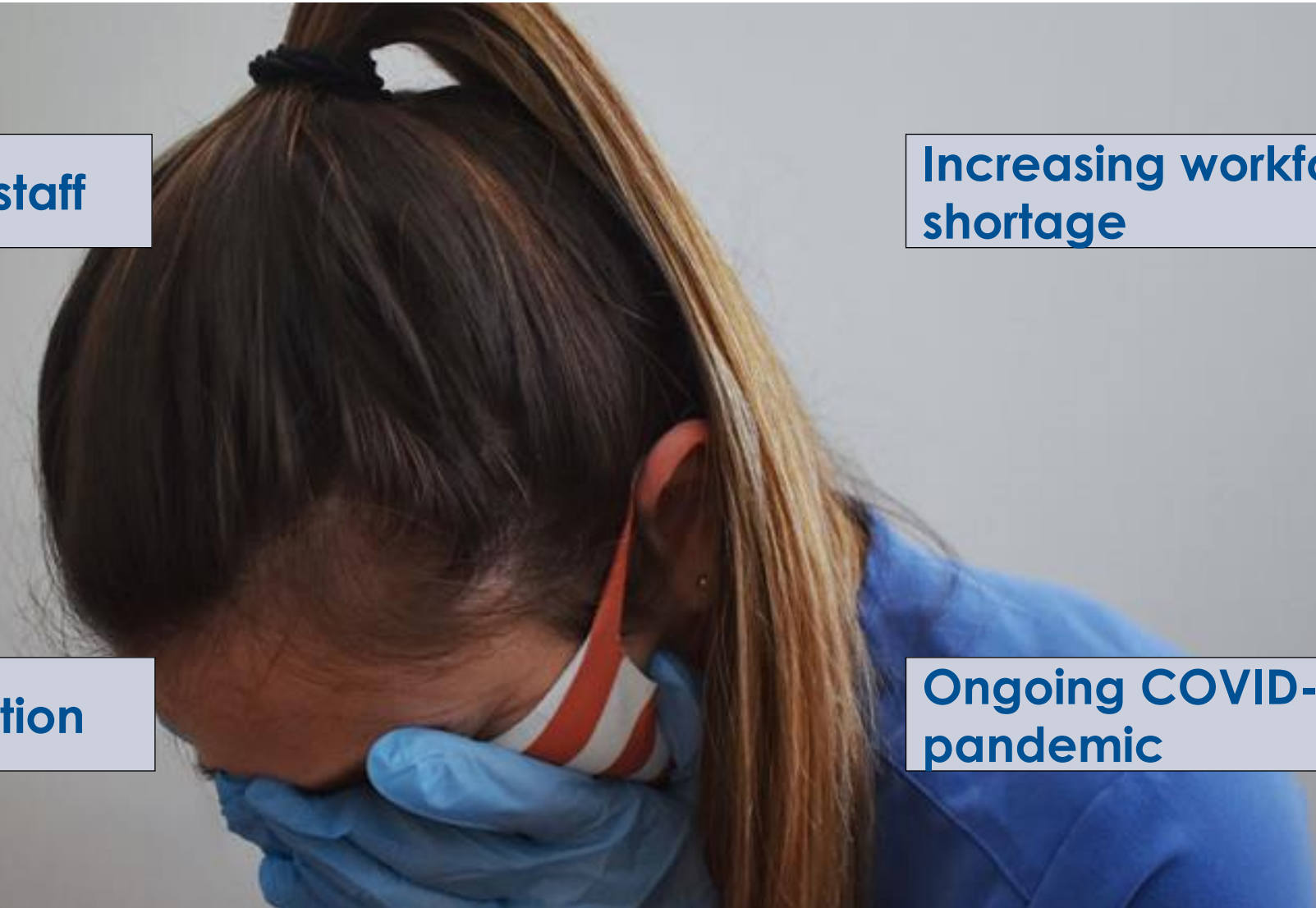
Burnout in the Lab

Overburdened staff

Increasing workforce shortage

Lack of recognition

Ongoing COVID-19 pandemic



Poll Question

Which of the following healthcare trends has had the biggest impact on your laboratory?

- COVID-19
- PAMA
- M&A
- Staff Shortages
- All of the above
- Other

Laboratory Professional Staff Shortage

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Critical Staff Shortages



Continuing ↓
in qualified
MLSs

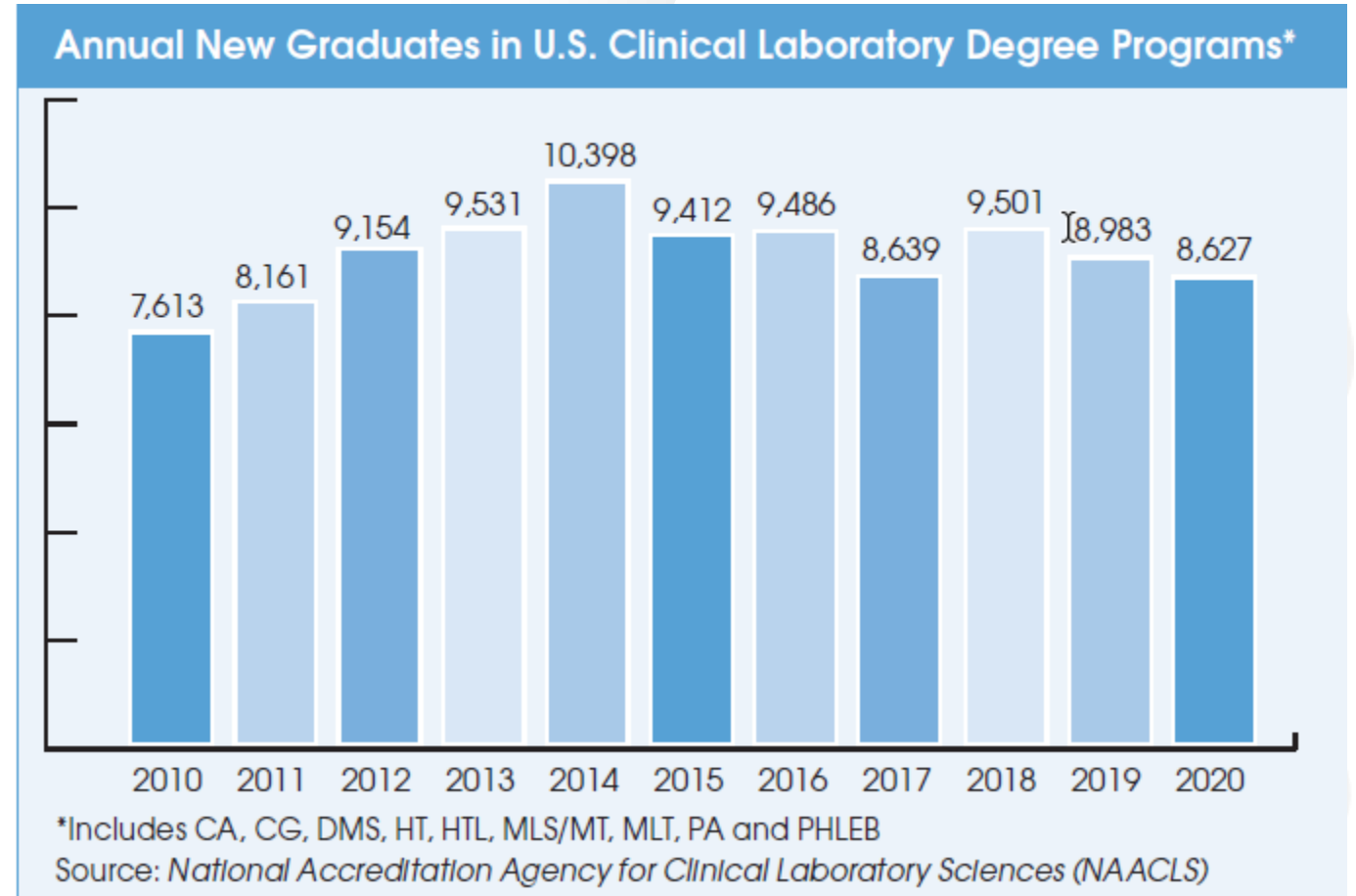
Not matching
the demand
for new
scientists as
older
generation
retires

↑ in non-
certified
individuals
performing
low- to high-
complexity
tests

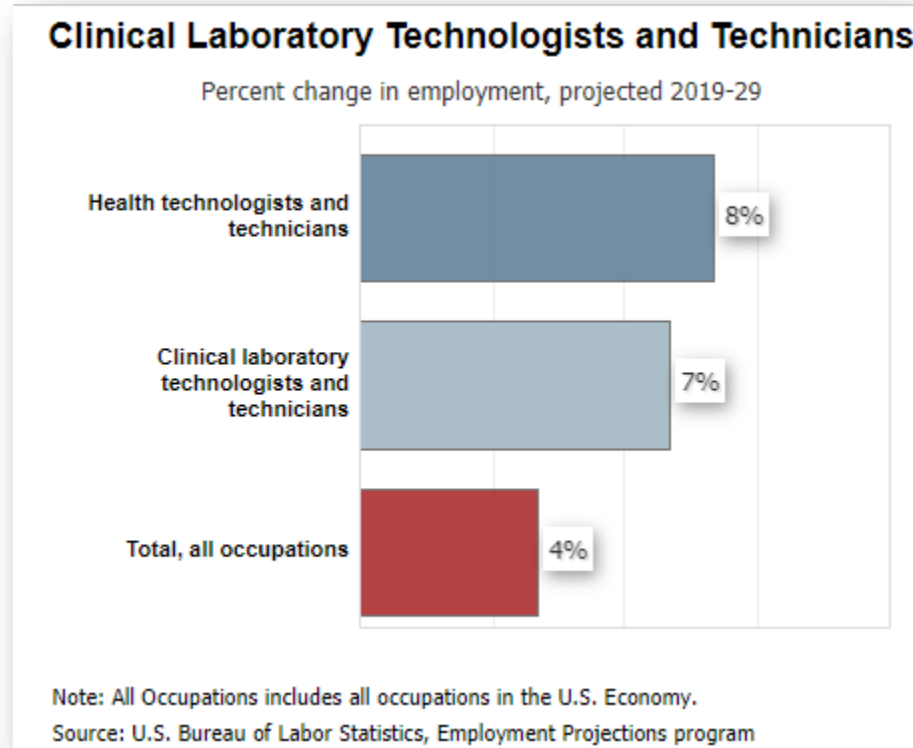
↑ rate of
laboratory
staff taking on
more
responsibilities

Pandemic Intensified Staff Shortage

- Difficult for MLS programs to access clinical rotation sites
- Higher rate of early retirement for employees with health concerns
- Increased demand for workers due to the high volume of COVID-19 testing

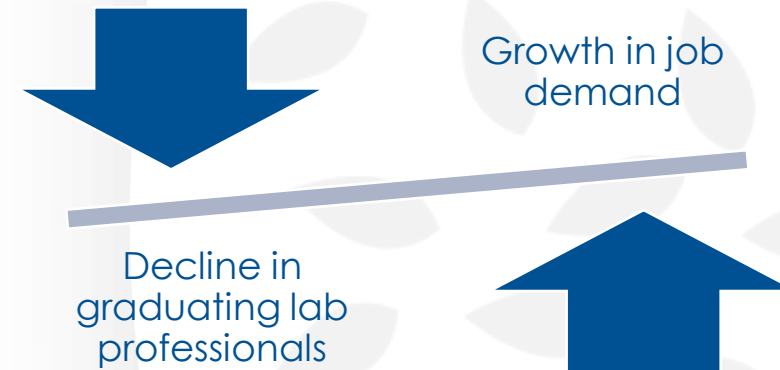


Staff Shortages Reach Critical Stage



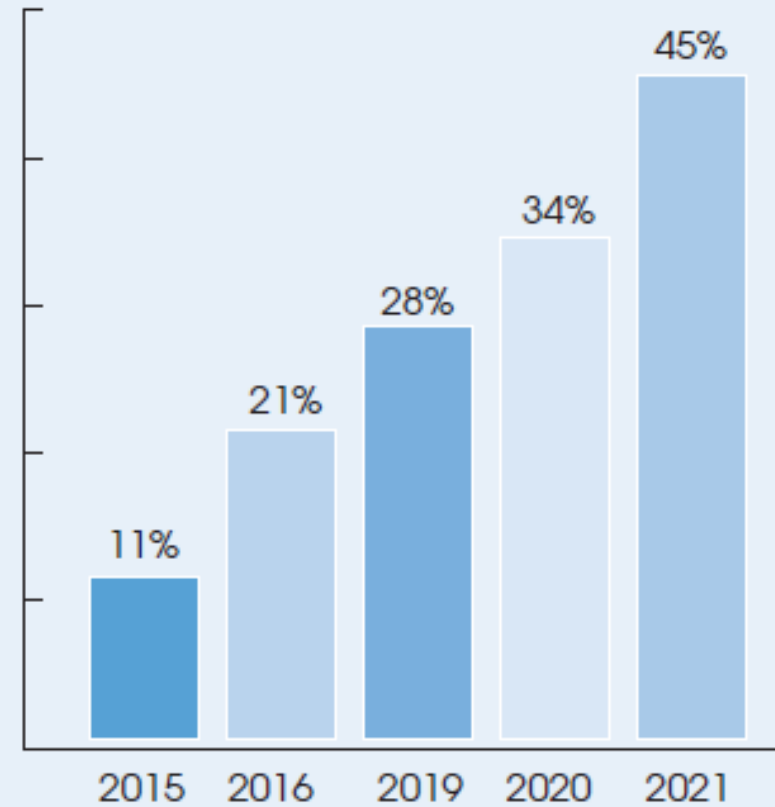
Demand projected to grow 7%
from 2019 to 2029

Average lab vacancy rate is 7%



Staffing Concerns Reaching a Critical Level

Technical Staff Shortages Are A Big Challenge

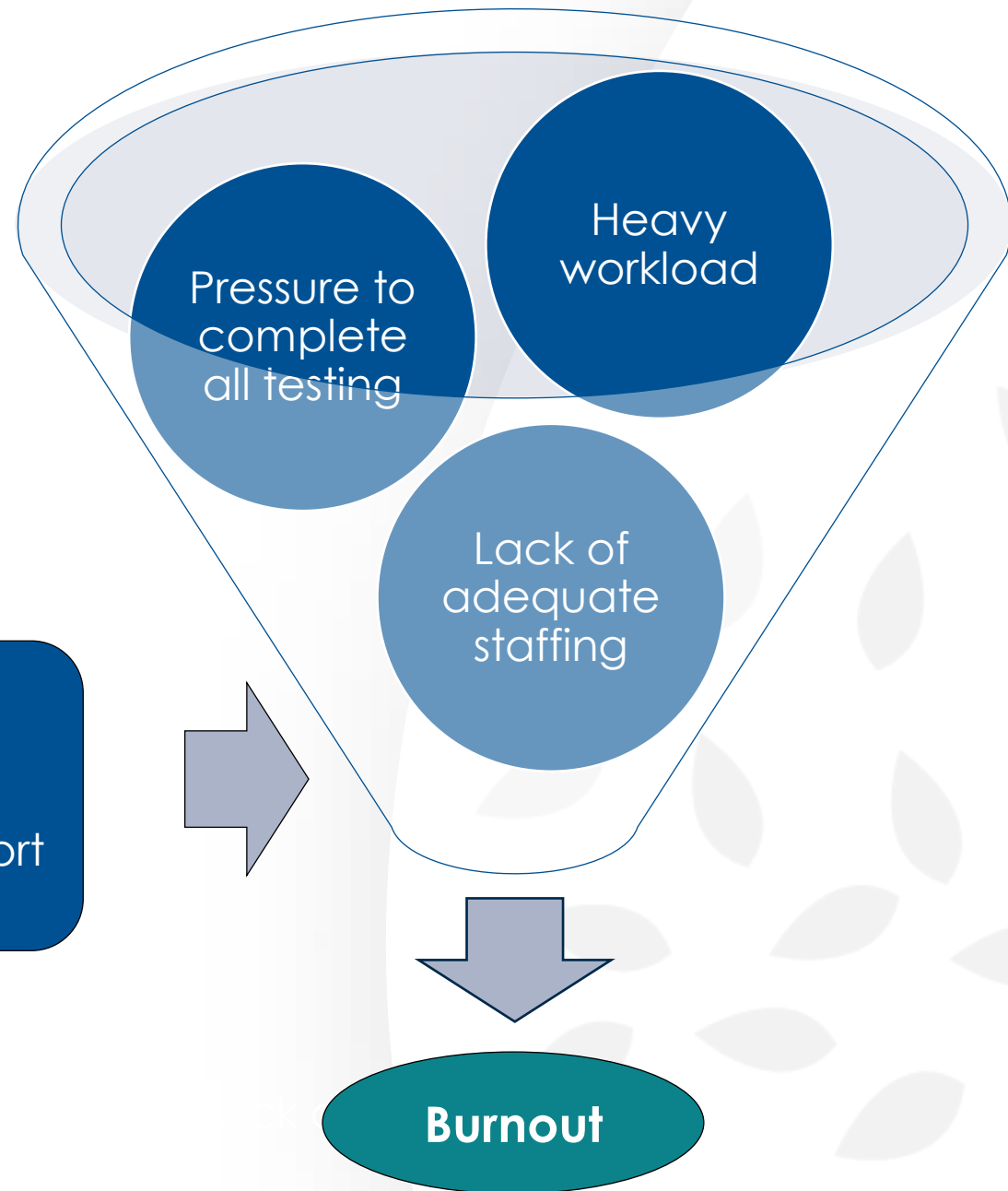


Source: *Laboratory Economics Surveys* (December 2021, October 2020, July 2019, August 2016 and July 2015—no comparable LE surveys were conducted in 2017 and 2018)

2020 ASCLS Job Satisfaction Survey

Lack of

- Appreciation
- Recognition/respect
- Understanding & support from management



“The pandemic revealed the fearless commitment and ingenuity of clinical laboratorians and the IVD industry, but stress and burnout have left them wounded.”



53.4 % feeling significant job stress

44.4% considering changing careers

85.3 % experiencing burnout

24.9% considering retiring

Sources: Garcia, Edna, et al. "The American Society for Clinical Pathology's job satisfaction, well-being, and burnout survey of laboratory professionals." *American Journal of Clinical Pathology* 153.4 (2020): 470–486.

Miller, J. Your Burnout is Real. CLN. Oct 2021. <https://www.aacc.org/cln/articles/2021/october/your-burnout-is-real>

The “Great Resignation”

- Large # of healthcare workers leaving jobs because of the pandemic
- Attributed to anxiety from the pandemic
- Abundance of open lab positions
 - Early retirements
 - Graduates going into more specialized training programs
 - Shift in the way the current working generation views employment

Quit Levels Among Healthcare and Social Assistance Workers	
Month (2021)	Workers who quit
August	552,000
September	562,000
October	546,000
November	592,000
December	503,000
Total	2,755,000

Nearly 2.8 million healthcare and social workers quit their jobs from August through December 2021. Source: Bureau of Labor Statistics.

Burnout is an Official Workplace Syndrome



Although not quantified among laboratory professionals, logic dictates that burnout among laboratory professionals leads to an increased opportunity for diagnostic errors.

World Health Organization Burn-out defined in ICD-11

“Burn-out is a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. It is characterized by three dimensions:

- feelings of energy depletion or exhaustion;
- increased mental distance from one’s job, or feelings of negativism or cynicism related to one's job; and
- reduced professional efficacy.”

Urgent Need for Tools that Boost Productivity



Poll Question

Do you believe that your laboratory utilizes its IT systems (i.e., EMR-LIS integration) to the fullest extent?

- Yes, we are leveraging every tool we have available
- Sort-of, we are trying but need to find the time to set up/ validate
- No, we have a long way to go

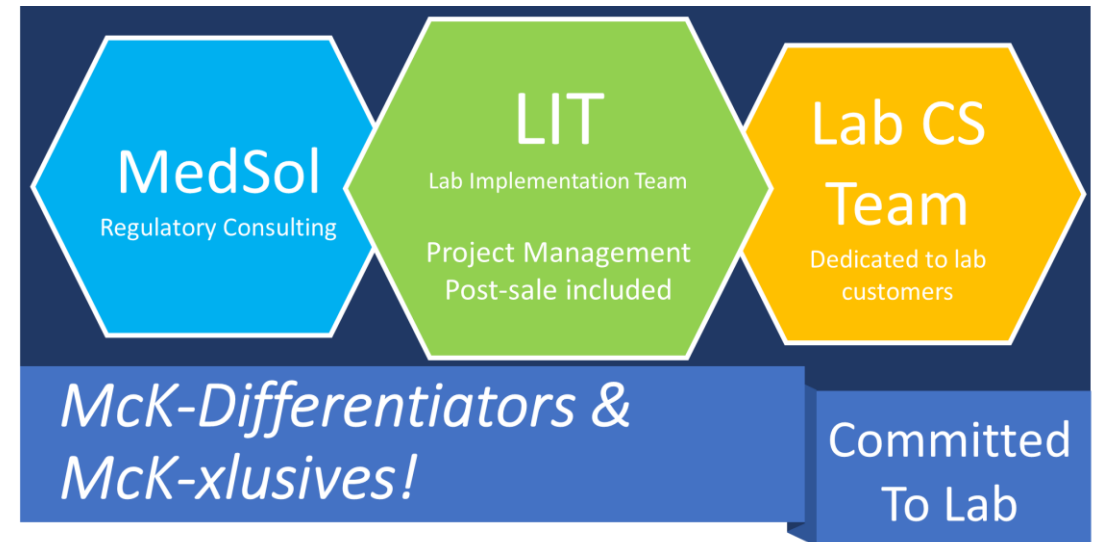
Time & Money Saved with LIS Integration: A Case Study

Case Study Scenario

Multi-State LTC Health System

- ✓ Over 1000 employees
- ✓ >100 locations in over 3 states
- ✓ Complex enterprise-wide lab with large testing menu in need of sample tracking, remote sample collection and POC testing capabilities

MCKESSON White Glove Approach



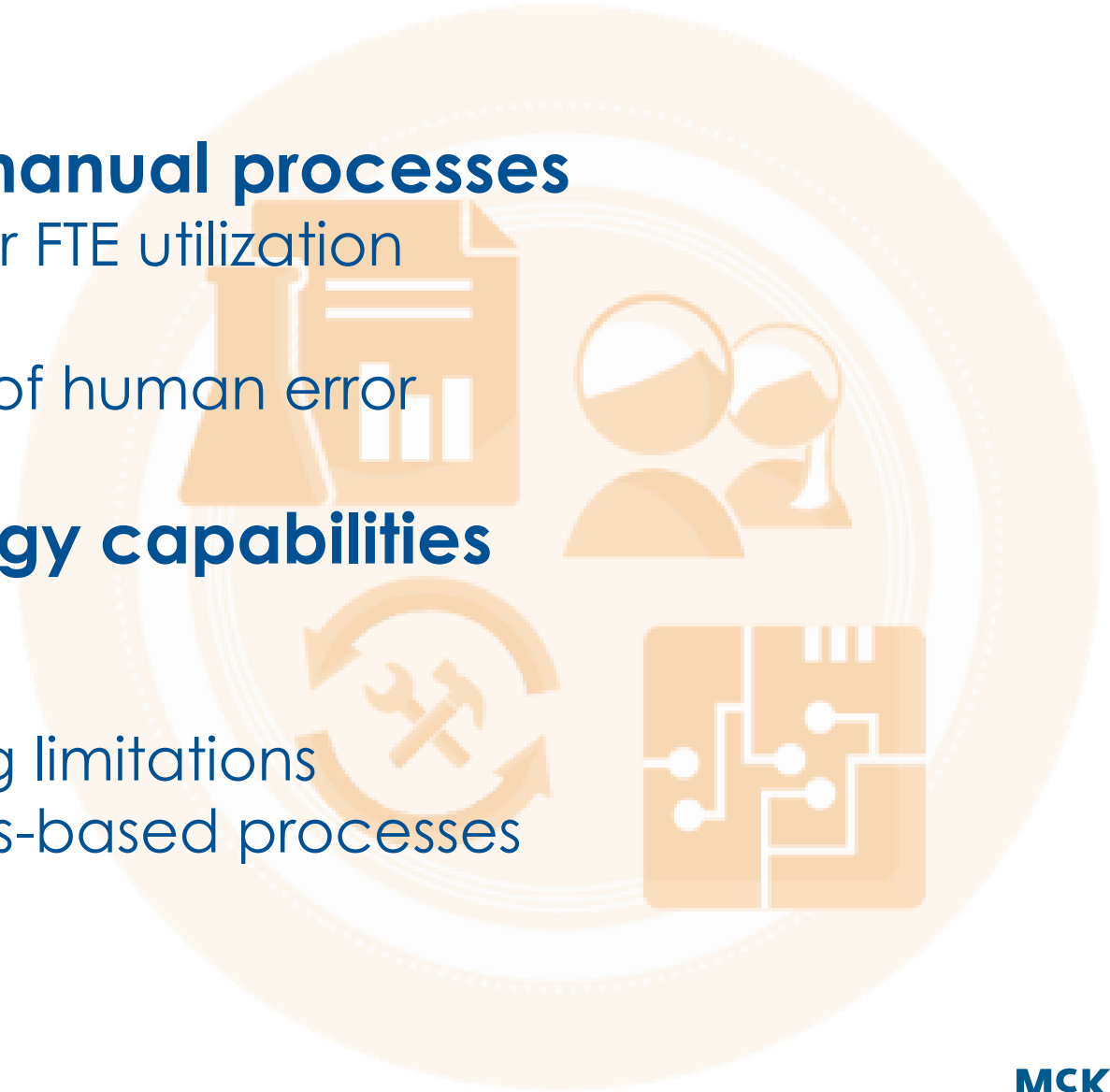
Challenges to Overcome

Over dependence on manual processes

- ✓ Lost profits due to poor FTE utilization (time=money)
- ✓ Increased probability of human error

Old or missing technology capabilities

- ✓ Little or no scalability
- ✓ No positive patient ID
- ✓ Manual state reporting limitations
- ✓ Needed complex rules-based processes



Investment vs. Savings

By implementing Orchard Software, this customer will save 76,186.70 hours, just with the procedures below.

That's 36.6 FTE's

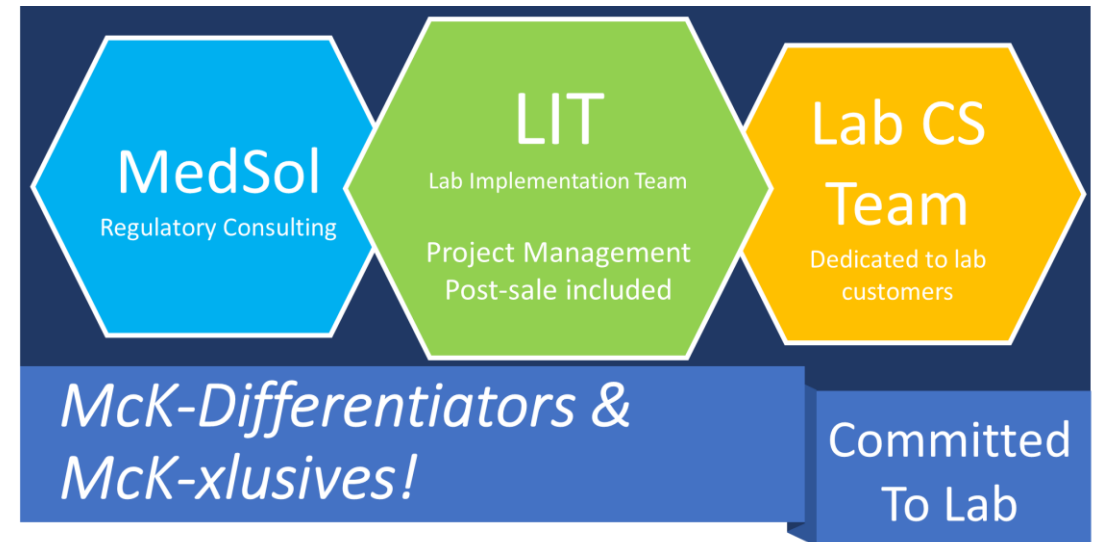
At \$15/hr plus employee fees, that represents.... **\$1,427,400 Annually**

<u>Manual process</u>	<u>Minutes per procedure</u>	<u>Procedures per year</u>	<u>Total Minutes Saved</u>	<u>Total Hours Saved</u>
Handwriting each tube (Avg. 3/patient)	0.75	3,000,000	2,250,000	37,500
Manually input lab order into CLS portal	1	1,000,000	1,000,000	16,666.7
retrieve and save results from reference labs	1	1,000,000	1,000,000	16,666.7
Human Error Correcting @ 1% of 4M procedures	10	4,000	40,000	666.7
Tracking down missing info for billing or testing	10	12,000	120,000	2,000.0
Charge for Covid Cepheid test	5.5	20,800	114,400	1,906.7
Load each Covid test	2:30	20,800	2,167	36.1
Result each covid test	3:30	20,800	3,033	50.6
Upload each Covid result to states	2	20,800	41,600	693.3
Total			-	76,186.7

Tech Time & Money Saved with LIS

- ✓ Over 75,000 hours of time saved by eliminating wasted manual processes
- ✓ Approximately 37 FTEs saved
- ✓ Almost \$1.5M saved annually in operating costs
- ✓ Improved Turn Around Times (TAT)
- ✓ Better patient-experience w/faster diagnostic capabilities for providers

MCKESSON White Glove Approach



Job Satisfaction Boost

Employees who have tools that make their day-to-day tasks easier are happier.

Workers feel a greater sense of achievement when their valuable time is not spent on repetitive tasks.

The LIS can automate repetitive tasks, leaving time for MLSs to take care of hand-on tasks.

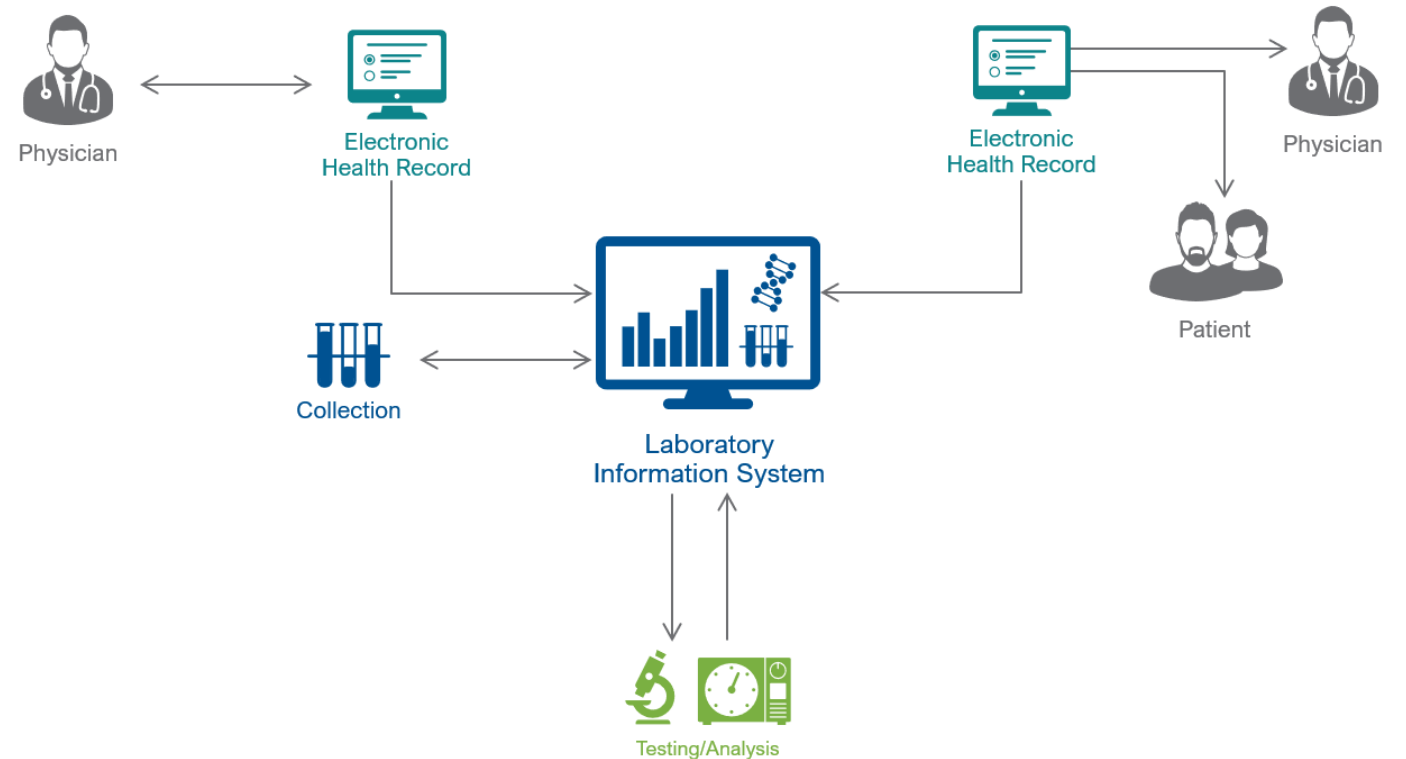
The LIS improves lab efficiency, productivity, communication, & outreach ability.

Overall Benefits of Implementing an Integrated LIS

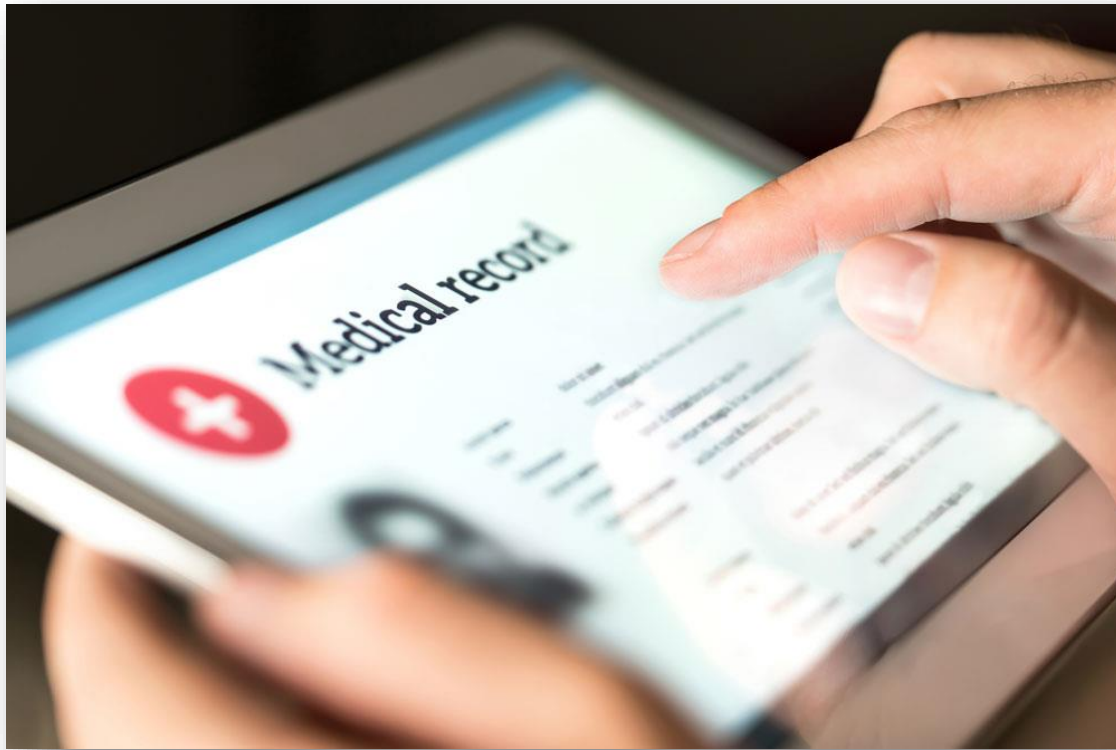
Automate Orders & Result Delivery

An integrated LIS automates the entire test ordering and resulting process

- Orders are placed in the EMR
- Results return to the EMR



Faster TAT – Better patient care



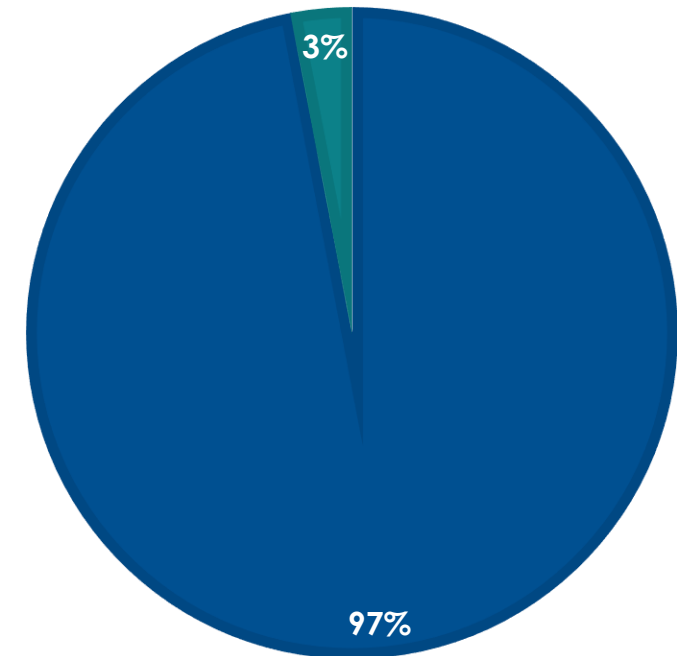
- With orders flowing from the EMR to the LIS and results returning to the patients' charts, results are immediately available for the provider
- Faster TAT allows providers to make faster clinical decisions that lead to faster diagnoses
- Delays in diagnosis can exacerbate patient conditions

Downstream Cost Savings

- Downstream cost savings are associated with lab testing.
 - Prescriptions
 - Imaging
 - Surgeries
 - Hospital LOS

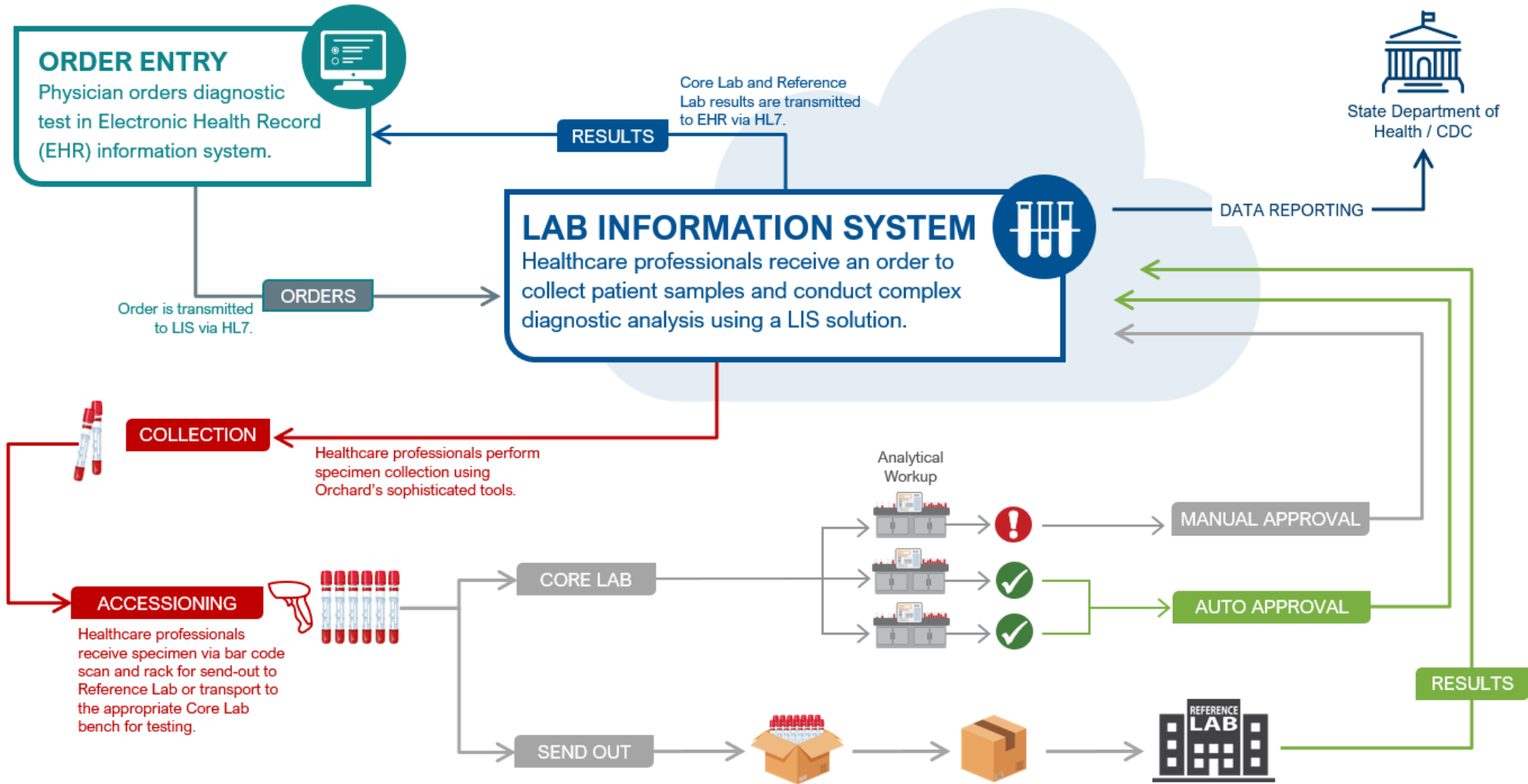
HEALTHCARE SPENDING

■ All other ■ Lab



Lab testing is only ~3% of healthcare spending.

Streamline Workflows



Autoverification

Helps improve quality,
reduce costs, & simplify
processes

Provides consistent test
reporting with
dramatic
improvements in TAT &
reduction in error rates



Depending on your lab menu and patient population, 40% to 95% of results could qualify for autoverification.

Reduce Manual/Paper Processes

Is this stack of
paperwork sitting on
your desk right now?



“Inspection-ready” Lab

Quality Control

Track qualitative & quantitative QC with L-J graphs & Westgard rules

Allow inspectors to view QC graphs on LIS (do not need to print)

See multiple L-J graphs on one screen for comparison

Perform required weekly QC review – automate documentation of review

Quality Assurance/Assessment

Standardize comments for unacceptable specimens, rejected tests – rejected orders log

Create error reports with corrective action comments (by provider)

Track remedial action reports by pre-, analytical, post-

Track TAT for time-sensitive tests

Lab Stewardship



Think beyond reporting test results to downstream healthcare processes

Assist providers in best test selection & interpretation

Laboratory stewardship means the laboratory takes responsibility for the use of lab testing—from order through interpretation to analytics.

Standardization

Can improve efficiency,
& workflow across
clinical operations

Standardized policies,
procedures, & methodologies
improve manageability, quality,
& efficiency due to decreased
redundancy & errors



Rules Help Standardize Workflow & Reduce Errors

Auto-route testing based on insurance requirements

Do not allow orders without Dx codes

Print the exact number of labels needed

Do not allow results to be released without acceptable QC

Reflex to secondary test based on results of primary test

Auto-deliver reports how and where you want

Auto-verify "normal" results

Automatically attach correct CPT codes to billing reports



Reduce "sticky" notes!

Error Reduction Improved Patient Safety

Automating result delivery removes opportunities for human error and supports improved patient care.



Audit Trails Sample Tracking

- Tools to organize & track laboratory samples throughout the testing continuum



Data Mining

Data that lives in your LIS is available to help achieve quality goals, promote population health management, and close care gaps.

Set up automated reports to track laboratory metrics on a consistent basis

Utilization monitoring

Staff productivity

TAT tracking



LIS Integration “Wins”

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Provider Satisfaction



Employee Satisfaction



Employee Retention

- Increased competition among labs for qualified MLSs
- Happy employees stay
- Employees are happy when they are supported by technology & tools that make their jobs easier
- Job satisfaction is tied to workload
- LIS can improve productivity and reduce workload burden



- Integrate your lab
- Access patient records & data
- Standardize procedures
- Efficiently use resources
- Reduce errors & paper
- Automate reporting
- Reduce TAT
- Improve staff performance & satisfaction
- Improve your lab's contribution to patient care

**Effective Use
of your LIS**

Key Takeaways



Healthcare & lab industries face continual challenges



COVID-19 placed enormous pressure on an already short-staffed industry



It is Important to find ways to retain & motivate lab staff to reduce burnout



There are opportunities for significant time and costs savings associated with LIS use



The LIS provides a multitude of benefits for the lab & helps improve overall patient care



Healthcare's financial terrain makes it imperative that today's labs are highly efficient

Q&A

Thank You!