The Impact Of Technology On New Healthcare Models

Lance V. Berberian
Chief Information Officer
Where I Have Been

Electronic Data Systems
Quest Diagnostics (CIO)
Interim Healthcare (CIO)
IDEXX Laboratories (CIO)
LabCorp (CIO)

What I Do

Traditional IT:
• Systems
• Infrastructure
• Information Security

Other:
• Product Development
• Robotics
• Bioinformatics
Enterprise Strategic Overview
LabCorp is a leading global life sciences company that is deeply integrated in guiding patient care.

Our Mission is to Improve Health and Improve Lives.

Our Strategic Objectives are to:
1. Deliver World-Class Diagnostics
2. Bring Innovative Medicines to Patients Faster
3. Use Technology to Improve the Delivery of Care
We bring this strategy to life by combining the strengths of two leading healthcare companies.

“At Scale” Diagnostic Laboratory

- 5,000 Frequently Ordered and Specialty Tests
- 700 Ph.D.s & M.D.s on Staff
- Convenient Patient Service Centers (PSCs)

PLUS

- 500 million Tests Performed Per Year
- 3,100 Couriers that Transport Specimens
- 11,500 Phlebotomists in PSCs and Customer Locations

End-to-End Drug Development

Research
- Preclinical
- Phase I
- Phase II
- Phase III
- Phase IV
- RWE

Laboratory Services & Information

Development
- DISCOVERY
- COMMERCIAL

Commercial
1. Based on guidance issued on November 30, 2018.
2. EPS, as presented, represents an adjusted, non-GAAP financial measure (excludes amortization, restructuring and other special charges). See Appendix for non-GAAP reconciliation.
3. Free cash flow represents operating cash flow less capital expenditures in each of the years presented. See Appendix for non-GAAP reconciliation.
4. Free cash flow in 2017 and 2016 has been reduced by $8.7 million and $13.4 million, respectively, as the result of implementation of ASU 2016-18. This amount represents the amount of historical payments made on the Company’s zero-coupon subordinated notes deemed to be accreted interest.
5. Free cash flow increased by $47.4 million and $34.6 million in 2017 and 2016, respectively, for the reclassification of tax payments for net share settlements relating to employee stock vesting from operating activities to financing activities.
6. Free cash flow includes a fourth quarter tax payment of approximately $125 million related to the disposition of the Food Solutions business.
LabCorp Diagnostics
Strategic Innovation
Utilizing Technological Innovation to Improve Care, Lower Cost and Enhance Consumer Experiences
Link Physician Portal for Convenient Access to LabCorp Information and Services

- **LabCorp | Link™ Order and Results:**
  - Enhanced level of ordering and results reporting including historic results trending
  - Integrated with many client EMRs for demographics
  - View saved, standing and pending orders
  - Automate routine tasks including Medicare ABNs
  - Integrated AccuDraw

- **LabCorp | Link™ eServices:**
  - Suite of mobile optimized value added capabilities for ordering providers to use with Link or their own EMR
  - Provides on-line supply ordering, invoice management and payment, billing information, ABN determination, Accudraw, and test change notifications
Report Modernization –
Improving the Physician and Patient Experience

- Physician friendly, easy to read, quick to digest.
- Improves patient communication and education.
MDSL and the Matrix Optimize our Clinical Decision Support (CDS) Systems
EDI Connectivity in Support of Health Systems, Hospitals and Physician Offices

- Support for >700 EHR and LIS System Interfaces
- 8,000 – 10,000 Unique EDI Connections Implemented Annually
- >200 Personnel in Technical and Project Management Roles
- Provide Technical Support for > 67,000 active interfaces
- > 7 Million Electronic Order per Month (40%)
- Leverage Platforms for:
  - B2B
  - B2C
Developing Integrated “Research Hub” Model for Hospitals and Health Systems

- Grow reference testing
- Cultivate long-term, comprehensive partnerships
- Improve patient recruiting for pharmaceutical companies
- Expand patient recruitment
- Enhance site identification

- Access to new revenue stream
- Differentiate from competitors
- Enhance academic reputation
- Reduce costs under value-based reimbursement framework

- Greater access to clinical trials
- Improve patient care and outcomes

LabCorp

Diagnostics

Pharmaceutical Companies

Hospitals, Health Systems & Large Provider Networks

Patients

Integrated “Research Hub” Model
The Phoenix Project is Modernizing our Unique Business Processes and Systems

Examples:

- **Revenue Cycle Management (a.k.a. Healthcare Billing)**
  System to improve our cash flow, DSO, bad debt expense and efficiency.

- **Customer Support** for health system and physician customers by enhancing our self-service capabilities and optimizing our call center services.
High-Performance Healthcare Big Data Platform with a Variety of Customer Focused Tools

- “Data Lake” to Accumulate Disparate Data
- “ELTTT” and Information Curation
- Master Data Management
- Patient Matching
- Memory / Disk Optimization Engine
- Flexible Information Access Tools:
  - Structured Reporting
  - Business Analytics
  - Data Feeds to other systems
  - Power tools for Data Scientists & Statisticians (SAS, R, etc.)

Data Sources
- Secure Access Layer & Reusable Visualization Components
- Data Lake on Hadoop (Raw and Trusted Zone)
- High Speed In-Memory Platform on SAP HANA (Refined Zone)
- Data Integration and Monitoring
- Lab Results
- Billing Data
- Specialty Labs (IO, IG, etc.)
- Master Patient Data
- Phoenix Data Repository

Apps
- Machine Consumption
- Portals
- Workbench
- Data Science

Platform
AccuDraw Phlebotomist Guidance System Ensures Accuracy and Precision

- Combines on-screen visual cues with specimen collection instructions based on the specific combination of tests ordered to help ensure accuracy and precision when collecting specimens
- Following the collection, handling, and shipping guidance may help to reduce the need for patient redraws and repeat visits
- Integrated into LabCorp systems used by our In Office Phlebotomists and Clients as well as in our Patient Service Centers
- Available on the Internet for use by our customers (https://accudraw.labcorp.com)
LabCorp Designs and Builds Proprietary Advanced Robotics

- Propel serum aliquoting robot
- Software and hardware designed and built by LabCorp
- Processes 80,000 orders (250,000 test tubes) in an eight hour shift
- Currently implemented at our laboratories in:
  - Burlington, NC (x2)
  - Tampa, FL
  - Birmingham, AL
  - Dublin, OH
  - Houston, TX
- Enhances efficiency, quality and customer service.

Technical Statistics
- 7,000 square feet
- 133,000 pounds
- 50,000 piece parts
- 4000 actuators
- 49 robots
- 17 machine vision systems
- 2 miles of network cable
- 1 million lines of code
LabCorp Designs and Builds Proprietary Advanced Robotics
Bioinformatics Team is Accelerating the Introduction of New DNA Tests to the Market
Why Focus on Patients as Consumers?

- Consumers are taking greater responsibility for their wellness and healthcare
- Higher co-pays and deductibles drive consumers to influence healthcare decisions
- Advances in technology drive expectation of convenience
- Empowered consumers expect convenience, insights, engagement, and price transparency
- LabCorp is uniquely positioned to engage with healthcare consumers at scale:
  - Performs testing for >2.5 million consumers per week
  - Sees >150,000 consumers per weekday in person
  - Has diagnosis and test result information
  - Has data and clinical expertise to engage with consumers in a personalized manner

Who is involved in the decision on where to get your lab testing?

- My doctor: 17% Not sure, 36% No Influence, 44% Influence, 4% Primary
- Me: 23% Not sure, 33% No Influence, 28% Influence, 7% Primary
- My insurance company: 33% Not sure, 30% No Influence, 7% Influence, 10% Primary
- My employer: 34% Not sure, 34% No Influence, 7% Influence, 10% Primary
- Family member/friend: 34% Not sure, 34% No Influence, 7% Influence, 10% Primary

2017 LabCorp Consumer Study
N=1,500
MOE +/- 2.5%
• The estimator service is enabled across the LabCorp PSC network and for LabCorp in-office phlebotomists

• Estimates are customized for each individual and health plan

• For select genetic testing, consumers can obtain cost estimates online without visiting a PSC
• Educate patients about what their lab results mean
• Empower patients to participate in their own care
• Condition-specific care plans
LabCorp at Walgreens

LabCorp PSCs in Walgreens stores are attracting new patients

% of Patients Seen at Walgreens that are New to LabCorp

30%
20%
10%
0%

LabCorp at Walgreens PSCs

28%

Comparable LabCorp PSCs

18%
Moving Reliable Self-Collected Testing to the Home
Enhancing the Consumer Experience
Leveraging Technological Innovation and LabCorp-Covance Combined Strength

- Improved Trials by using Real World Evidence
- Comprehensive Companion Diagnostics (CDx) Solutions
- Portfolio of Innovative Solutions Focused on Client Needs
Leveraging LabCorp-Covance Combined Strength
Holistic Approach to Protocol, Site/Investigator, and Patient Intelligence

**Improved Trials**

- **Protocol**
  - Covance supports ~50% of all clinical trials
  - Deep therapeutic expertise
  - LabCorp patient data reduces the screen fail rate

- **Optimization**
- **Site / Investigator**
  - Covance supports ~50% of all clinical trials
  - Site / Investigator performance database
  - Geolocation of sites / investigators globally

- **Selection**
- **Patient**
  - ~115 million LabCorp patient encounters annually
  - ~1,900 patient service centers
  - High-quality data (Dx codes, demographics and results)
  - >50 million global CLS patient lab results per year
Ulcerative Colitis Example

Ulcerative colitis
Understanding the Impact of Study Design on the Protocol and Available Patient Pool

| Description                                                                 | Number   
|-----------------------------------------------------------------------------|----------
| 51,814 patients between June 2016 and May 2017 identified                   |          
| 48,708 patients between 18 and 80 years old                                |          
| 20,288 without Crohn’s Disease, IBD and UC Proctitis                       |          
| 20,146 without Malignancy, Inherited Immuno Syndrome, TB and HIV/AIDS       |          
| 20,075 without Hepatitis B and C                                            |          
| 13,950 with all relevant labs populated                                     |          
| 13,750 with Neutrophil value >= 1.5x10^9/L and Platelet >=100x10^9/L       |          
| 13,552 with Hemoglobin >= 8.5g/dL and Lymphocyte >500 cells/uL             |          
| 13,516 with Total WBC >=3.0 x 10^9/L and Serum Creatine <=2xULN            |          
| 13,227 with Alk Phos <=2xULN and ALT <=2xULN                               |          
| 12,980 with AST <=2xULN and Bilirubin <=3xULN                              |          

The protocol inclusion / exclusion criteria is applied to the patient pool and then matching patients are geo-located on the map.
Covance Data Insights Show Workload of Key Investigators

- Investigator patient accrual per study drops as more studies are taken on – diminishing return from in-demand sites
- Objective site performance data around the globe which includes 8+ pharma programs and 53 active UC studies
- Creates immediate 963 sites for targeted outreach
- 27 out of 1,054 (3%) of known investigators are not in an active trial

<table>
<thead>
<tr>
<th># Active Studies</th>
<th># Investigators</th>
<th>Patients Per Investigator</th>
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<td>9+</td>
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<td>1</td>
<td>644</td>
<td>10</td>
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<tr>
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Location of Investigator Sites in Relation to Ulcerative Colitis Patients

Sample from Seven UK GP Surgeries

**BLUE DOTS** – Crohn’s and UC Patients from EMR  
**SIZE OF BLUE DOTS** – Number of Patients  
**STARS** – Covance sites  
**COLOR OF STARS** – *Green* high score to *red* low score

**DOTS** – UC patients who match study design from LabCorp Real World Database  
**STARS** – High performing Covance sites
Companion Diagnostics (CDx) is a Key Driver of Precision Medicine

- A companion diagnostic is the ultimate biomarker test
  - Co-developed and linked with a specific therapy
  - Help identify patients most likely to respond
  - Help identify patients who may have an adverse event
  - Provide added value for how the diagnostic and therapy are used
- Genomic and proteomic biomarkers are key features of developing new therapies and diagnostics
- Collaborated with > 40 clients on > 165 CDx projects in 2017

Personalized Medicines Top 30% of FDA Approvals for First Time in 2017\(^{(1)}\)

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
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<tbody>
<tr>
<td></td>
<td>21%</td>
<td>28%</td>
<td>27%</td>
<td>34%</td>
</tr>
</tbody>
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Covance Provides Comprehensive CDx Solutions For The Drug Life Cycle

Drug Development
- Preclinical
- Phase I
- Phase II
- Phase III
- NDA Submission

Biomarker/CDx Development
- Biomarker Development
- CDx Assay & Feasibility
- CDx Development & Validation
- Regulatory Submission & CDx Launch

Commercialization
Covance Offers a Suite of Differentiated Drug Development Tools for Trial Planning and Execution

PharmAcuity

• Metrics and Benchmarking
• Trial Forecasting

endpoint

• Pulse
• Drive

Xcellerate®

• Clinical Data Hub
• Monitoring Solutions
• Data Management
• Insights

GLOBAL SPECIMEN SOLUTIONS

• GlobalCODE
• snapTRACK
• LabCODE
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