Meaningful Medical Analytics: Driven by Laboratory Data Integration

Are You Asking the Right Questions of Your Lab Data?

The changes taking place in healthcare offer great opportunities for the lab. The lab sits on the hub of clinical data that feeds diagnostic decision-making—information that will change the way we deliver and pay for care. Orchard Software wants to empower pathologists and laboratory leaders to see the value of the information they are processing and to become active participants in analytics that advance the value of lab information, improve patient care, and save healthcare dollars.

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PART ONE: The changing healthcare landscape, how it impacts the lab, and how advanced analytics involving lab data can play a larger contributory role

New Approach Required for Aging, Sicker Population
In the U.S., we face an aging population and a steady increase in chronic disease. As of 2012, nearly half of all adults—117 million people—have one or more chronic disease conditions.\(^1\) Seven of the top 10 causes of death can be tied to a chronic disease, with heart disease and cancer accounting for nearly 50% of deaths. Additionally, the population of 65 and older has increased from 35 million in 2000 to 41.4 million in 2011 (an 18% increase) and is projected to increase to 79.7 million by 2040.\(^2\) These demographic shifts are proof there is a need to prevent or delay the onset of age-related illnesses, such as cancer, heart disease, and diabetes. See Figure 1.

Combine these U.S. healthcare statistics with a misaligned fee-for-service (FFS) reimbursement model that rewards for quantity of care rather than quality of care and you have a recipe for disaster. This combination has culminated in unsustainable growth in healthcare spending and a plethora of unnecessary, and sometimes harmful, services. In response, our healthcare system is in the midst of unprecedented transformation driven by healthcare reform laws that attempt to renew focus on improving the quality of patient care and reducing per capita healthcare costs.

Unlocking the potential of the enormous amount of data amassed is vital to solving the healthcare conundrum in healthcare. Healthcare data must be analyzed in order to find specific ways to improve the overall health of the population by incorporating preventive services into the public health system, managing chronic diseases (that account for the bulk of healthcare spending) more effectively, and decreasing the fragmentation of healthcare services.

Laboratory data is healthcare’s highest-volume activity with seven to 10 billion tests performed each year. Information from the laboratory accounts for a large percentage of the overall data providers use to diagnose and care for patients, and therefore accounts for much of the structured clinical data available in the EHR. But is the power of that data limited only to the results themselves? Or is there more value that can be garnered from clinical data, particularly...
when combined with other data sets? Are some of the benefits of those results being overlooked because no one knows what to look for? **Analytics that combine laboratory data with finance, pharmacy, radiology, and other departments can play a pivotal role in the strategic planning necessary to improve the quality of care and reduce overall costs.**

**Healthcare’s Emerging Economic Landscape**

According to predictions by the Centers for Medicare & Medicaid Services (CMS), per capita healthcare spending is on track to reach $10,000 per person in 2015, with much of these costs shifted into high-deductible insurance plans. Overall spending in healthcare is near $3 trillion and is expected to rise to 19.3% of GDP by 2023, an increase from 17.2% in 2012. Bottom line: Our current spending trajectory in healthcare is clearly unsustainable.

**Lab’s Economic Landscape**

In spite of the tremendous amount of money being spent in healthcare, lab reimbursements have continually declined. Between 2010 and 2013, Clinical Laboratory Fee Schedule (CLFS) reimbursement rates were cut by nearly 12% and laboratory reimbursements continue to dwindle. Just last year, the Protecting Access to Medicare Act of 2014 (PAMA) was signed into law, creating provisions that directly impact laboratory reimbursements. Section 216 of PAMA, entitled “Improving Policies for Clinical Laboratory Tests,” sets into motion a plan to begin basing Medicare reimbursements for clinical lab tests on private sector payment rates beginning in 2017. Passage of PAMA will cut $2.4 billion from Medicare Part B reimbursements for clinical laboratory tests, indicating a significant change in lab payments. The overall cuts between now and 2022 will potentially reach a cumulative 75% reduction in future CLFS reimbursements. See Figure 2.

Pathology has been shouldering slashes in Medicare reimbursements for the past two years, in particular CPT 88305-TC—the most important code for pathology groups, used to code for biopsy tissue slide preparation—which was reduced 52% in 2013.

**Reimbursement Shift From Volume to Value**

This January, the U.S. Department of Health and Human Services (HHS) announced specific goals and a timeline for Medicare reimbursements to shift from FFS toward outcomes-based reimbursements. See Figure 3 (next page). By the end of 2016, at least 30% of FFS Medicare payments will be tied to value through alternative payment models, such as Accountable Care Organizations (ACOs) or bundled payment arrangements. By the end of 2018, that will increase to 50%. To get an idea of how quickly reimbursement models are shifting, as of 2011, Medicare made almost no payments through alternative payment models. To make this scalable beyond Medicare, the Health Care Transformation Task
Force was created with the intention of shifting 75% of operations for private payers to contracts that improve quality and lower costs by 2020. These announcements point out not only the rapid pace in which change is taking place, but also the need for a strategic plan that addresses escalating healthcare costs and the critical need for better population health management.

How will these cuts affect the lab? Ask yourself this: If lab reimbursements decrease to zero dollars, will labs close? How do you articulate the value of the lab in a non-FFS model? Providers cannot take care of patients without the lab, so the lab will not go away as a tool in healthcare—the lab actually becomes more valuable. The shifts we are seeing in healthcare reimbursement will only make the laboratory a more valuable part of the treatment plan.

Lab value comes from results that drive diagnosis and treatment protocols, but results can also influence decisions made downstream that impact patient care. And if this collaboration is expanded upon via lab results collated with other data sets, much more benefit can be achieved. Potential savings generated by these interventions will more than pay for the costs of the lab tests; they will save money throughout the organization and simultaneously improve patient care. Labs remain essential no matter what happens to reimbursements.

The Burgeoning Potential of Advanced Healthcare Analytics

Wikipedia defines analytics as “the discovery and communication of meaningful patterns in data. Especially valuable in areas rich with recorded information, analytics relies on the simultaneous application of statistics, computer programming, and operations research to quantify performance. Analytics often favors data visualization to communicate insight.”
Gartner, the world’s leading information technology research and advisory company, describes analytics as a continuum that moves from descriptive analytics (hindsight) to diagnostic and predictive analytics (insight), to prescriptive analytics (foresight)—a progression that parallels both an increase in the value of and the difficulty in obtaining the analytics. See Figure 4. This progression moves from looking at past data to see what happened, to predicting what will happen, to thinking about what we can do to make certain things happen in the future.

SAS, a leading advanced analytics software company, breaks analytics down into eight levels. See Figure 5 (next page). The majority of analytics available today fall into the first four categories: standard reports, ad hoc reports, query drilldown, or alerts. These typically provide a rear-view mirror look at what has already happened, but offer little insight into the future. Often, these types of analytics suffice for simple situations.

The more complex beast of healthcare reform requires multifaceted questions to be asked and answered and that we look for predictive insights from data using the last four categories: statistical analysis, forecasting, predictive modeling, and optimization. Difficulty rears its head in the healthcare setting because, while expertise is available in analyzing volumes of data, analyzing healthcare data also requires in-depth medical knowledge to understand which data sets to combine and what questions to ask of those data sets.
Laboratory Data Integration Driving Meaningful Medical Analytics

1. **STANDARD REPORTS**
   - Answers the questions: What happened? When did it happen?

2. **AD HOC REPORTS**
   - Answers the questions: How many? How often? Where?

3. **QUERY DRILLDOWN or Online Analytical Processing (OLAP)**
   - Where exactly is the problem? How do I find the answers?

4. **ALERTS**
   - When should I react? What actions are needed now?

5. **STATISTICAL ANALYSIS**
   - Why is this happening? What opportunities am I missing?

6. **FORECASTING**
   - What if these trends continue? How much is needed? When will it be needed?

7. **PREDICTIVE MODELING**
   - What will happen next? How will it affect my business?

8. **OPTIMIZATION**
   - How do we do things better? What is the best decision for a complex problem?

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**Healthcare’s Data Conundrum: How Do We Turn Disparate Data Into Meaningful Information?**

Data is growing and moving faster than healthcare organizations can figure out how to leverage it to gain insights. And data lives in multiple places, such as individual EHRs, LISs, imaging systems, physician notes, medical correspondence, payor claims, pharmacy systems, CRM systems, and finance. See Figure 6 (next page). Accessing this valuable data and factoring it into clinical and advanced analytics is critical to improving care and outcomes, incentivizing the right behaviors, and driving efficiencies.

Rapid progress has been made in clinical analytics—techniques for analyzing large quantities of data and gleaning new insights from that analysis, which is part of “big data.” As a result, there are unprecedented opportunities to use big data and data analytics to reduce the cost of healthcare. Big data is a term used for massive amounts of information that can be interpreted by analytics to provide an overview of trends or patterns. Organizations leverage big data by compiling information and then interpreting it with analytics. Although common in other industries, big data has only recently become a factor in healthcare. Its applications range from provider-specific business intelligence to scouring an entire state’s health records to pinpoint people who are at risk for certain conditions. Proper analysis of big data in healthcare can potentially target early warning signs and improve patient safety.9
One of the earliest uses of big data to generate new insights has been in predictive analytics. In addition to the typical administrative and clinical data, integrating additional data about the patient and his or her environment might provide better predictions and help target interventions for specific patients. These predictions can identify places to improve healthcare quality and efficiency in areas such as readmissions, adverse events, treatment optimization, and early identification of progressing disease states or highest-need populations.\(^\text{10}\)

Providers and payers are increasingly investing in their analytical capabilities to help them make better sense of the changing healthcare environment but this technology is still in its infancy. Today’s healthcare CIOs are facing more challenges than ever, including consumerism, information security, and preparation for value-based payments.\(^\text{11}\) Patients are becoming better-informed users of healthcare and are demanding the level of customer service they are accustomed to in retail and banking markets. Empowered consumers want transparency and quality data to make the best-informed decisions.

Healthcare organizations are leveraging big data technology to capture all information about a patient to get more insight into care coordination and outcomes-based reimbursement models, population health management, and patient engagement and outreach. As providers look toward shared savings, the focus begins with the largest consumers of healthcare—patients with chronic conditions—to decrease hospital utilization, decrease length of stay (LOS), and begin preventive care targeted at early identification of these conditions.

Currently, it is estimated that big data in healthcare, leveraged effectively, could create $300 billion in value every year.\(^\text{12}\) With the healthcare industry at the beginning of its reform journey toward more accountable care, it will take tremendous partnering to develop, organize, and optimize the new IT solutions that will be required to support and facilitate the new healthcare model.\(^\text{13}\)
The Laboratory Value Proposition

Making future business decisions is easier when decisions are based on data. A cost-benefit analysis is a decision-support method that measures and weighs the benefits of a particular course of action. It is a powerful tool used to analyze the probable value of investing in something new. Feeling confident that the benefits derived from an action will outweigh the costs of implementing that action makes the decision to proceed much easier.\(^\text{14}\) The simplest way to look at the relationship between benefit, cost, and the corresponding value is in the following equation: Value = Benefit/Cost. In addition, the following equation is important for resources to invest in healthcare: Profit = Revenue – Expenses. See Figure 7.

In healthcare, the value we are striving for derives from focus on the Institute for Healthcare Improvement (IHI) Triple Aim goals: improving patient outcomes, improving patient satisfaction, and decreasing costs. By simplifying operational tasks and putting methodologies and processes in place that improve efficiency, further revenue can be generated while simultaneously improving patient care and satisfaction. However, to accomplish this, collaboration between hospital departments is required.

If we agree that the overriding goal is a united effort to improve healthcare, it becomes imperative that each member of the healthcare team utilizes their knowledge and experience. The laboratory is often “in the basement,” both literally and figuratively, and some in the laboratory see their primary role beginning and ending with performing and reporting lab results. In the new laboratory value continuum, this must be expanded. See Figure 8. Pathologists and laboratorians can become data brokers who inform clinicians how that data can be integrated with other data—creating more than just lab analytics. There is added value in integrating lab data with other data sets so the new information can influence the next choice.

Diagnostic information is the currency of the new healthcare model, and diagnostic information coming from the lab can be used to improve a healthcare organization’s viability and sustainability.
PART TWO: Real world examples of internal use of lab data and results of lab data analyzed with other data sets

Case Studies at the University of Mississippi Medical Center

For the most part, laboratories have mastered the science of reporting accurate results, including proficiency in quality control, quality assessment, and cost efficiency. Internally, laboratories tend to be run with an eye on efficiency and are accustomed to being on a tight budget. With the myriad changes in regards to the restructuring of U.S. healthcare delivery, the time has come to branch out beyond those mastered areas. One of the ways laboratories can best support the ordering provider in today's market is by offering expertise in test order optimization and interpretation. This can involve many interventions, from offering alerts or testing cascades at the time of CPOE, to the use of variation analysis studies, test formularies, or comprehensive test utilization plans.

Focus on Unnecessary Testing

Below are several real-world examples put in place at the University of Mississippi Medical Center by Dr. Brad Brimhall, Senior Consultant for the Enterprise Data Warehouse and Integrated Analytics, and professor of pathology and internal medicine. Dr. Brimhall and his colleagues have been instrumental in showcasing the value of laboratory data and how it can be used to find substantial savings concurrent with improvements in patient care and satisfaction. The section below delves into test order optimization.

Implement Duplicate Testing Alerts

There is no better time to influence provider ordering patterns in a positive way than at the time the order is placed. It is a well-documented fact that providing useful information at the time of order, and the way in which orders are presented, has an impact on provider test selection.

A simple intervention at the University of Mississippi resulted in a surprising amount of savings. The lab introduced duplicate testing alerts in its Epic EHR at the time of CPOE. See Figure 9. Initially, the alert triggered for CBC and BMP if those same tests had been ordered within the previous four hours. With no other pressure or communication other than the alert, they saw a 40% reduction in duplicate orders for those two tests and generated an annualized variable cost savings of $72,576. See Figure 10.

<table>
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<tr>
<th>Test</th>
<th>Total</th>
<th>Cancel</th>
<th>Pct Cancel</th>
<th>Vbl Cost</th>
<th>Total</th>
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<td>$40,730</td>
<td>$63,875</td>
</tr>
<tr>
<td>CBC</td>
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<td>$17,668</td>
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<td>$18,368</td>
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<td>MG</td>
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<td>1,914</td>
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<td>$6,393</td>
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<td>14,519</td>
<td>42.7%</td>
<td>$72,576</td>
<td>$131,423</td>
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</table>

Figure 9: EHR CPOE Duplicate Testing Alert

Figure 10: Savings from Duplicate Alerts
Laboratory Data Integration Driving Meaningful Medical Analytics

Eliminate Unnecessary Testing Groups

Often, certain tests or test combinations are ordered out of habit because providers are unaware of updated testing recommendations, or even in error due to a similar name or acronym. The laboratory can take the initiative to ensure testing recommendations are up to date and communicated properly.

At the University of Mississippi, Dr. Brimhall and his team reviewed eight different groups of tests, for 23 combinations. This data was reviewed in two hospital systems: Hospital System 1 included four hospitals and more than 500 providers; Hospital System 2 included 12 hospitals and more than 4,000 providers. He also took a look at four large regional payors over a minimum of a two-year period.

By reducing and simultaneously improving these test orders, both hospital groups identified significant savings: Group 1 saved more than $395,000 in variable costs, and Group 2 saved more than $750,000 in variable costs. For Group 2, adding in labor costs revealed potential savings of more than $1.2 million. See Figures 11 and 12.

From the payor perspective, the total claims amount paid was $32.2 million, a savings of about 40 cents per member per month (PMPM), so payors saw this intervention in a positive light. Incidentally, some payors are now beginning to act by issuing policy coverage recommendations that reflect these practices (e.g., further thyroid testing is not approved unless the TSH is abnormal). The thyroid cascade is a perfect example of an opportunity to put in place a testing reflex or cascade to minimize inappropriate testing. Another reflex opportunity is in the instance of a GGT order accompanied by an ALKP; better practice would be to order the GGT as a reflex only when the ALKP is abnormal. See Figure 13 (next Page).
Other unnecessary testing groups Dr. Brimhall and his team focused on included scenarios where testing recommendations offer a better test option for a particular diagnosis or where testing is only recommended for certain diagnoses. For example, amylase and lipase are often ordered in tandem, yet the lipase may be sufficient for diagnosis in most cases. As new guidelines are released, some tests might become obsolete. Or, for a particular diagnosis, another test might be a better indicator, such as replacing the ESR with CRP for inflammation, or the CKMB with troponin for myocardial infarction.

Often, in trying to screen for vitamin D deficiency, providers inadvertently order a 1,25 dihydroxy vitamin D, which is more appropriate in the setting of renal failure. Iron saturation is most appropriately ordered for iron overload, ferritin for iron deficiency; when these tests are ordered together, this may be an unnecessary testing combination.

The Power of Combining Lab Data

By far, the most comprehensive impact the laboratory can have involves the pathologist or other laboratory leader finding ways to combine lab data with data from other departments and offering substantial improvements in patient care and/or organization-wide savings. The following case studies are a result of Dr. Brimhall’s collaboration with other departments in the hospital to enhance the value of the lab data beyond the value of the results, having a broader impact on patient care and cost savings.
New Technology Evaluation: Looking at the Bigger Picture

As the lab grows to understand its value to the overall organization, thinking beyond only the cost per test, testing platforms are beginning to shift and offer testing that has greater diagnostic value. A certain methodology on the typical lab cost spreadsheet may appear expensive, but the downstream savings are more than enough to cover the testing costs and provide a better test methodology that also creates revenue for the hospital. The laboratory at the University of Mississippi Medical Center looked into replacing its current methodology for speciating bacteria from a blood culture to a MALDI-TOF methodology. The lab’s standard method involved using a gram stain, which was inexpensive and fast, yet incredibly limited in terms of information provided to the clinician, accompanied by a culture, which is very slow, somewhat expensive, but more accurate. In comparison, the MALDI-TOF analysis designed to replace this is fast, also somewhat expensive, but much more accurate.

In the initial profitability analysis (see Figure 14), the project earned $33,408 in savings with an initial investment of $312,000, equating to a payback period of 26 years. Needless to say, this proposal was not very attractive to administration, particularly because the MALDI-TOF analyzer would be reaching end of life in about 15 years and there was a negative net present value (NPV) of $228,519. NPV is used in capital budgeting to analyze the profitability of an investment or project, so presented in this fashion, from a financial standpoint, this looked like a losing endeavor.

Dr. Brimhall and his colleagues decided to take a different approach and look further into the benefits brought by increasing diagnostic efficiency. “Think about what this [MALDI-TOF] instrument actually does; it decreases the time to get a diagnosis, increasing the diagnostic efficiency. We are in the information business, not the lab business,” explains Dr. Brimhall. In his literature research, Dr. Brimhall found studies that show that the most conservative time savings to bacterial identification is 28.8 hours and that about one-fourth of the time, test results change which antibiotic is used. What does that mean financially? From here, Dr. Brimhall, in collaboration with the finance department, reviewed three Medicare Severity Diagnosis Related Groups (MS-DRGs) for sepsis and found 710 patients with an LOS greater than two days. He then looked at fixed and variable costs to determine how much it costs per day to keep a patient with sepsis in the hospital. This was determined to be $1,471.79 per day.

Figure 14: Initial Profitability Analysis for MALDI-TOF

<table>
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<tr>
<th>Item</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Total</th>
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<td>($19,178)</td>
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<td>Sum of cash flows</td>
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<td>Payback period (years)</td>
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<td>Payback period (weeks)</td>
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<tr>
<td>Discount rate</td>
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<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Discounted internal rate of return</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
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<tr>
<td>Reinvestment rate</td>
<td>-2.24%</td>
<td>-2.24%</td>
<td>-2.24%</td>
<td>-2.24%</td>
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<td>-2.24%</td>
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<tr>
<td>Net present value</td>
<td>Discount rate 5%</td>
<td>Discount rate 5%</td>
<td>Discount rate 5%</td>
<td>Discount rate 5%</td>
<td>Discount rate 5%</td>
<td>($228,519)</td>
</tr>
</tbody>
</table>
Laboratory Data Integration Driving Meaningful Medical Analytics

If you add that vital piece of information into the pro forma balance sheet, it makes a much bigger splash with administration. See Figure 15. The payback period decreases from 26 years to 12.6 weeks—a much more compelling endeavor. The NPV is now $5,471,954, and if you invested the same amount in a bank account, you would need to get an 80.79% rate of return in order to match the return from this project. Just to be certain this would work, Dr. Brimhall did a sensitivity analysis to determine how much of an LOS decrease would be required to achieve a two-year payback. This turned out to be only 3.59 hours, so in effect the providers would have to discharge one out of every six sepsis patients one day early—certainly an attainable goal.

Radiology Project: Lab Intervention Increases Satisfaction

Another area where the laboratory was able to make an impact involved collaboration with the radiology department. There was an ongoing issue with some of the patients scheduled for radiology studies with contrast. Both patients and radiologists were displeased with long wait times associated with waiting for a creatinine result to determine if the patient’s kidneys were healthy enough to handle the contrast. Approximately 17 patients per month walked out disgruntled without receiving their scan. Dr. Brimhall and his colleagues talked to administration about considering a point-of-care (POC) creatinine for these patients and this was eventually approved. So, in a sense, the laboratory is connected to and driving the efficiency of radiology studies.
Using combined data from Epic and Allscripts, Dr. Brimhall and his team performed a before-and-after comparison, looking at the difference in MRI, CT, and PET scan patient volumes. The resulting difference in annualized additional patient volume brought in $495,323 more in net revenue. When you subtract the cost of additional contrast and the cost of the POC reagents, there was still an additional net revenue of $377,100. See Figure 16. In addition to the added revenue, the POC devices were paid for in less than one month, the number of walk-outs decreased from 17.7 to 2.6 per month, and satisfaction improved for both patients and radiologists.

**Pharmacy Utilization: Better Antibiotic Stewardship**

The most lucrative collaboration involved combining lab results with pharmacy data. When Dr. Brimhall talked with his pharmacy colleagues, there was a shared concern about antibiotic stewardship, specifically the initial estimate that as much as $12-15 million per year was being spent on unnecessary pharmaceuticals for inpatients, mostly on antibiotics. They began the study by taking a more in-depth look at expensive “Gorillacillin” (slang term for a very powerful antibiotic) usage. They focused on two of the most expensive antibiotics and discovered a tremendous cost saving opportunity. In their collaborative study, they uncovered 2,157 unnecessary doses, which equated to a total of $705,877 (variable costs) spent on unnecessary antibiotics. Switching those patients to Vancomycin would have cost $56,211, but even after subtracting the cost of the Vancomycin, this project resulted in a $649,665 in savings.

Results of microbiology sensitivities were available from the lab to help determine when it was appropriate to use the most expensive antibiotics. Yet, in order to use that data to its full potential, they had to combine data from multiple sources. Once clinicians find out the bacteria are sensitive to Vancomycin, which is much less expensive, why would they continue treating with a more expensive antibiotic? See Figure 17. “In comparison, not to minimize the importance of reducing unnecessary testing and promoting optimal test orders, but where’s your real leverage? Is it focusing on lab utilization or is it focusing on lab utilization and beyond?” asks Dr. Brimhall.
Data Warehousing & Analytics for Laboratory Professionals

In light of these findings, the research department at the University of Mississippi decided to build an Enterprise Data Warehouse, intended for research but also used for clinical work, to help identify and quantify problems. A data warehouse is a powerful data management system that encompasses all of the data from disparate sources and brings it into a common database structured to optimize performance of advanced analyses. Effective use of data requires integrating business, financial, and clinical data into an operative enterprise data warehouse because data warehousing is the foundational platform for analytics. Using these analytics tools, problems can be uncovered and strategies can be developed to make improvements. Analysis of the data in the warehouse can be used to monitor and fine-tune strategies and make sure problems are rectified. The data warehouse can be a robust tool to help manage healthcare delivery.

Because lab testing is healthcare's highest-volume activity, these massive databases rely heavily on laboratory data and are capable of providing new tools for evidence-based medicine that has vast possibilities waiting to be tapped. Current applications are already shaping key business decisions, directly aiding clinicians, and steering patient treatment. And laboratories, manufacturers, and researchers envision a multitude of potential applications. The lab staff at the University of Mississippi Medical Center are contributing to the data warehouse design and are beginning to carve out a reputation of being more than just a laboratory.

PART THREE: Orchard’s plan to build a data analysis project portfolio and guide the data-oriented pathologist

Orchard Analytics is Here to Help

Imperative to the development of these positive interventions is knowing what questions to ask of the data. How does lab data interact with data sets from departments such as finance, pharmacy, radiology, OR, ICU, etc.? Knowing how lab data is used in each of those scenarios allows for more in-depth thought on projects that can save tremendous amounts of healthcare dollars.

Orchard Analytics, a new business unit of Orchard Software Corporation, provides analytic services and advanced training to support pathologists, lab leaders, and healthcare administrators in learning to use healthcare data from disparate sources to improve patient care and reduce costs.
Orchard Analytics (OA) offers two avenues that support this endeavor:

1. **Analytical Services**, to include analysis of organization-specific data sets to pinpoint savings and patient care improvement opportunities; and a specialized training opportunity, the Orchard School of Medical Analytics (OSMA), to train leaders to derive analytic, cost-saving opportunities within their own facilities.

2. **A Healthcare Analytics Consortium** where members can share project formats and results of lucrative analytic initiatives among the group. Consortium members experience the dual advantage of benefiting not only from the results of their own internal projects but from other members’ shared projects and results.

The services offered include the following steps and options:

- **On-site Data Assessment for Project**
- **Analytics Project Proposal & Pricing Model**
- **Orchard School of Medical Analytics (OSMA)**
- **Analytics Project Implementation**
- **Membership in the Orchard Healthcare Analytics Consortium**

**Projects Yield Proven Results**

The OA team will delve into your facility’s data sets to clean and analyze the data specific to ongoing projects. **Projects are based on proven results that have already been shown to enhance antibiotic stewardship, increase patient satisfaction, and save hundreds of thousands of healthcare dollars.** The projects focus on global analytic opportunities to improve patient care and reduce spending by looking at the whole picture and incorporating lab data with other data sets to maximize downstream cost savings.

![Figure 18: Orchard’s Healthcare Analytics Consortium](image-url)

**Figure 18: Orchard’s Healthcare Analytics Consortium**

![Figure 19: Projects Based on Proven Results](image-url)

**Figure 19: Projects Based on Proven Results**

www.orchardanalytics.com
The Orchard School of Medical Analytics

The laboratory sits on the hub of clinical data that feeds diagnostics decision making, and pathologists are key players. The changes taking place in the healthcare system offer great opportunities for the lab, as the lab holds the bulk of the diagnostic information that will change how we deliver and pay for care. We want to encourage pathologists to become active participants in the way lab information is used. The goal is to empower pathologists and laboratory leaders to see the value of the information they are processing and to believe in it—to learn to articulate value in a positive and powerful way and to move from departmental-thinking to system-wide thinking. This requires thinking about the future, not just how things have been done to be successful in the past, and learning to find new analytic opportunities to share within your organization.

Orchard Analytics offers a comprehensive training class, the OSMA, designed to nurture data-driven pathologists, laboratorians, and other analytic-minded leaders interested in making the most of lab data. Attendees will be taught new skill sets: to continue to be good stewards of the lab but also to process healthcare analytics. These analytics include lab data but offer more opportunities to improve patient care and save healthcare dollars by incorporating other data sources.

If you think about the lab as a tool instead of as its own entity, and think of the lab’s value to the overall healthcare system, what the lab brings to the table is tremendously powerful in regards to patient risk stratification and population health management. The information from the lab, combined with other clinical and financial data sets, is worth much more than the value of the tests themselves. As we move toward population health and bundled payments, it will be essential for labs to be involved in helping clinicians direct patient care. The pathologist leader can direct this relationship.

We expect our school to contribute at the highest levels—delivering value to the healthcare marketplace. Orchard is recognized as a leader in the lab industry. Now we plan to take that a step further and gain recognition as an integrator of diagnostic information. The challenge is to see the value of the lab impacting utilization outside of the lab. Lab results are not the only product. Lab data can be used to help evaluate other non-lab testing—think about how analytics can be performed so they impact the patient directly.

Summary

Healthcare is moving away from a system that rewards for quantity to a system that rewards for quality—for added value to the patient. In this new value-driven environment, information will be the key to success because this information will be analyzed to determine which activities yield value and which do not. Payments will be directed only toward value-added actions.

In the future, we are looking at not only using data to be efficient within the laboratory, but merging the lab’s data with other data sets to gain insight into overall patient care needs in a more comprehensive way. Simply put, lab analytics are extremely important, but by combining lab data with data from finance, pharmacy, radiology, and other departments, the benefits are greatly magnified.
Laboratories have squeezed out much inefficiency. They understand cuts and how to maximize efficiencies. Now it is time to build on that value and guide laboratories to become instrumental in directing targeted interventions. Laboratorians may underestimate how much experience they have in being efficient. They have skills and valuable information that can be shared with the physicians. We would like to support pathologists and lab leaders in evolving into a consultative role.

The laboratory, once again, is at the forefront of change. It interacts with almost all healthcare departments. The power to access, combine, and analyze large data sets can improve our ability to anticipate and treat illnesses. This data can be used to identify waste in the healthcare system and to hit the target of the Triple Aim goals: to improve the health of the population, improve the patient experience, and lower the cost of healthcare across the board.

Notes