2008 Trends in Clinical Pathology Laboratory Management

Ten Trends that Highlight Rapid Changes in Healthcare & Laboratory Medicine

By Robert L. Michel Sylvia Christensen
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As DARK Daily http://darkdaily.com/ celebrates its first year, we draw on current events, comments from our readers, and 11 years of wisdom from THE DARK REPORT http://www.darkreport.com/ to bring you 10 trends that hint at the future of clinical pathology laboratory management. This special report is designed to provide pathologists and lab administrators with our best assessment of the most important strategic drivers in the clinical laboratory and anatomic pathology marketplace.

DARK Daily has identified and analyzed 10 distinct trends. These have been distilled down and are presented to allow you to grasp the most essential elements of each trend. to the essential items we believe to be most significant. Our objective is to help you focus your strategic thinking on the critical few items that will have the greatest positive impact on your pathology group practice or laboratory.

10 trends may seem like a large number to keep up with, but this high number is significant in and of itself. The multiplicity of trends at play simultaneously reflects how the American healthcare system is changing. Not only are there more disruptive forces at work, but their effects are rapidly felt by laboratories, hospitals, physicians, and other providers. more rapid. Collectively, both factors reinforce each other and accelerate the pace of change currently seen in the healthcare system.
Naturally, some of the trends we present here are obvious to any keen observer of the American healthcare system. What you’ll find most valuable is our assessment of how each trend is likely to affect the clinical laboratory and anatomic pathology profession. This is useful analysis, designed to focus your strategic thinking.

As DARK Daily publishes an annual yearly list of clinical pathology laboratory management trends, we recommend our readers use them for strategic planning sessions. One trait of successful laboratories is a regular review of the business variables and market changes which affect the lab’s strategic thinking. Feedback from THE DARK REPORT readers tells us that reviewing a list of anatomic pathology trends for the year invariably triggers new insights.

It is difficult to prioritize this list from most important to least important. Our recommendation is that you look at each clinical laboratory and anatomic pathology trend as both a threat and an opportunity. The threat generally comes when a lab or pathology group does nothing in the face of significant changes which have negative impact on the lab’s finances. The opportunity comes from grasping a trend and positioning your pathology group to ride its crest—creating added value for your clients and generating additional revenue for you.

We hope you will find our list of trends and their in-depth analysis informative and relevant to your practice and continue to make use of the DARK Daily special report of clinical pathology laboratory trends for years to come.
Trend #1
Six Sigma and Lean Methods Set Deepening Roots

In recent years, Dark Daily and THE DARK REPORT have seen the use of Six Sigma and Lean methods move from a very small number of first mover laboratories to a larger number of early adopter laboratories. In 2003, clinical laboratories in three major health systems boldly became first to use Lean and Six Sigma principles to make over their high-volume core chemistry and hematology laboratories. Now, quality management programs using Six Sigma and Lean methods are being launched throughout all over the United States by early adopter laboratories.

Lean and Six Sigma are both process improvement methodologies. At a very basic level, Lean is about speed and efficiency, while Six Sigma is about precision and accuracy leading to data-driven decisions. Lean and Six Sigma methods are finding numerous applications in anatomic pathology laboratories and pathology group practices.

Effective use of Lean and Six Sigma principles generated significant benefits for Sonora Quest Laboratories http://www.sonoraquest.com/, which was recognized in December.
2005 with the Arizona Quality Program’s highest honor—the Governor’s Award. Sonora Quest became the only healthcare provider in Arizona to ever earn this recognition. Based on diligent measurements of its service, employee satisfaction, and customer satisfaction, Sonora Quest Laboratories has compelling evidence that it is raising the bar for laboratory testing services. Full details of Sonora Quest’s successful use of Lean and Six Sigma are available in the February 6, 2006 Dark Report http://www.darkreport.com/dark/02_07_2006.htm.

Another successful use of Lean and Six Sigma was carried out by the Jackson Health System http://www.jhsmiami.org/, which is home to 2 hospitals, a diagnostic center, 11 primary care centers, 2 long-term care facilities, 2 school-based clinics, and 5 corrections health services centers. When their customers argued for faster turnaround times, a Lean team was established to utilize Lean and Six Sigma principles to make processes more efficient. The team goals were to redesign the core laboratory, phlebotomy, and general services to improve turnaround times, maximize flow, eliminate waste, and reduce inventory/supplies and costs.

After conducting a thorough evaluation of their facility, the Lean team decided that non-value added activities abounded in their workplace. This was the result of both a shortage of the right type of staff and poor organization of the work space. An analysis of the walking patterns of various employees showed that they were traveling all over the office to perform their job functions. After the Lean redesign of the office space, walking distance from 109 ft to 16 feet for a certain type of employee, changing value added from 11% to 27%.
Figure 1.1 shows the outcomes and improvements from the Lean reorganization.

![Table: Lean Outcomes and Improvements at Jackson Health System](image)

**Table: Lean Outcomes and Improvements at Jackson Health System**

<table>
<thead>
<tr>
<th>Routine Samples</th>
<th>Prior to Lean</th>
<th>Post Lean</th>
<th>% Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average TAT for Chemistry (min)</td>
<td>160</td>
<td>86</td>
<td>46%</td>
</tr>
<tr>
<td>Specimens Processed/FTE/8hr</td>
<td>185</td>
<td>278</td>
<td>50%</td>
</tr>
<tr>
<td>Average TAT for Hematology (min)</td>
<td>103</td>
<td>56</td>
<td>46%</td>
</tr>
<tr>
<td>Specimens Processed/FTE/8hr</td>
<td>150</td>
<td>331</td>
<td>121%</td>
</tr>
</tbody>
</table>

Figure 1.2 shows the state of costs and the savings from 2003-2005.

![Table: Costs and Savings from 2003-2005 at Jackson Health System](image)

**Table: Costs and Savings from 2003-2005 at Jackson Health System**

<table>
<thead>
<tr>
<th>Outcomes/Improvements</th>
<th>FY 2003</th>
<th>FY 2004</th>
<th>FY 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Billable</td>
<td>3.3M</td>
<td>3.4M</td>
<td>3.4M</td>
</tr>
<tr>
<td>Agency FTEs</td>
<td>8.4</td>
<td>5.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Total FTEs (Actual)</td>
<td>365.7</td>
<td>344.3</td>
<td>314.6</td>
</tr>
<tr>
<td>Total FTEs (Budget)</td>
<td>351.6</td>
<td>354.1</td>
<td>332.3</td>
</tr>
<tr>
<td>Savings</td>
<td>$489K</td>
<td>$1.9M</td>
<td></td>
</tr>
</tbody>
</table>
It is only in the past year that projects such as the one at Jackson Health System have found their way into histology laboratories, and usually only in hospitals where the clinical lab has experience with Lean and Six Sigma techniques. The histology lab’s “Lean makeover” is usually a second or third generation project for a laboratory organization that is applying Lean techniques. Because a Lean project targeting the histology laboratory is usually a second or third phase project, it is usually handled by the clinical staff from other parts of the laboratory who have learned Lean and Six Sigma techniques, earned a black belt designation, and have the experience to design and execute the project.

In a similar fashion, those anatomic pathology group practices affiliated with hospital laboratories that have incorporated Lean/Six Sigma principles can take advantage of the hospital lab-funded Lean project. It provides pathologists with an opportunity to participate in the planning and execution of such projects in the clinical laboratory. This gives them first-hand experience in how these quality management tools are used in planning and implementing projects to improve work processes, reduce errors, increase productivity, and cut back on waste. They can then take these Lean and Six Sigma quality management methods and apply them in their own clinical pathology laboratory.
Probably the leading example of sophisticated use of quality management principles is at University of Miami/Jackson Memorial Hospital in Miami, Florida. In recent years, the pathology department has developed a “single piece work flow” system for collecting, processing, and diagnosing pathology specimens. About 80% of the tissue specimens received by the pathology department each day are reported out on the same day. Further, the pathology department has built a “stat” histology laboratory next to the operating room suites. This arrangement allows pathologists to provide surgeons with a diagnosis in as little as two hours—frequently just as the patient is wheeled out of recovery! Clinics love it and patients appreciate hearing their diagnosis so soon.

Across the country, pathology groups and histology laboratories are becoming aware of the power of quality management systems to improve clinical quality, reduce turnaround time, cut costs, and boost productivity. Adoption of quality management methods by anatomic pathology groups will increase steadily during the next five years. Dark Daily predicts that within the next 3 years, Lean and Six Sigma programs will move from early adopter laboratories and hospitals to the mainstream of most industries. This is because, as the health system emphasizes higher quality of clinical services at a lower cost, growing numbers of anatomic pathology group practices will recognize how Lean and Six Sigma methods can help them meet and exceed these expectations of their customers, whether it is the hospitals and clinicians they serve, patients, or payers.
Trend #2
Resurgence of Local Labs – But Most are Owned by Hospitals

Over the past five years, hospital laboratory outreach programs have filled the local laboratory vacuum left after independent laboratory companies were sold by their owners to public laboratory companies during the 1990s. This development has gone unheralded. In community after community since 2001, hospitals and health systems have launched laboratory outreach programs. Many times the initial lab outreach effort was organized only to serve office-based physicians owned by the parent hospital or health system. As the outreach program gained experience and resources, sales and marketing commenced to other office-based physicians in the community.

Many hospitals see laboratory outreach efforts as a way to increase revenue generated by a hospital laboratory. In the June 12, 2006 of The Dark Report Dark Report http://www.darkreport.com/dark/06_12_2006.htm detailed the economic pressures on hospital administrators and laboratory directors which have encouraged them to develop outreach programs as a way to increase the volume of specimens tested in the laboratory, thus lowering the overall average cost per test for inpatient testing. One example of such a hospital is Marquette General Health System http://www.mgh.org/ (MGHS) in Marquette, Michigan. In 1995, the system opened a Rural Reference Center that positioned MGHS well to provide outreach lab services to other facilities. By 2006, MGHS’ laboratory outreach program had grown to support over 130 clients including 14 Upper Peninsula hospitals, various physician offices, nursing homes, and other reference labs.
“We went after the reference lab business as a way to improve our
revenue stream, and counter what we perceived as a threat from
national labs that would result in lab carve outs,” said John Rhoades,
Laboratory Director at Marquette General. “We became pro-active
and developed an entrepreneurial attitude to create some business of
our own by courting new clients. We’ve been extremely successful.”
Details of Marquette’s success were published in a 2006 case study
titled Developing Lab Outreach Capabilities: A Real-World Example
provider of Web-based electronic medical records, clinical, and lab
outreach solutions that were integral to the outreach efforts.

In addition to increasing revenue for a hospital system, laboratory
outreach programs also have the ability to positively affect communities. In many communities, after local independent laboratories
were acquired by a national lab company, the national lab would
close down the acquired laboratory facility and consolidate the test-
ing into one of its existing regional laboratory facilities. This had
two consequences. It left many medical technologists and other
trained lab staff unemployed in smaller communities. It often also
caused a decline in service, since physicians were now served from
a laboratory facility that was located hundreds, even thousands of
miles away.

The resulting situation was recognized as a business opportunity by
local hospitals. Hospitals had a ready pool of med techs available to
hire, along with local service reps and sales people eager to leave
the national lab company and bring their client relationships to the
hospital’s outreach program. Hospitals increased revenue, techni-
cians were able to find work again, and doctors were again able to
deal with a local laboratory.
Together, the economic pressure on hospital laboratories to increase revenue and the obvious opportunity to provide a local lab testing service have encouraged the creation of a substantial number of hospital laboratory outreach programs across the United States. Collectively, these lab outreach programs are nibbling at the market share held by LabCorp http://www.labcorp.com/ and Quest Diagnostics http://questdiagnostics.com/. In fact, the best of these outreach programs are tough competitors. Examples are NorDx Laboratories http://www.nordx.org/ in Scarborough, Maine and DSI Laboratories http://www.dsilabs.com/ in Fort Meyers, Florida in the East, Central DuPage Hospital http://www.cdh.org/ in Winfield, Illinois in the Midwest, and PAML/PACLAB http://www.paclab.com/ in Washington State and John Muir Medical Center http://www.johnmuirhealth.com/index.php/jmmdhs_jmmc.html in Walnut Creek, California in the Far West. The success of these hospital outreach programs against the national laboratories shows that it is possible to compete and grow.
Trend #3

Growing Use of Electronic Medical Records by Doctors Requires Responses by Laboratories

Dark Daily has run numerous articles about the introduction and adoption of electronic medical records (EMRs). Although their adoption has been slow, when big companies like Wal-Mart decided this year to take them into their own hands and create them for their 2.5 million workers and dependents in the near future (see Corporations Take Electronic Health Records into their Own Hands http://www.darkdaily.com/laboratory-pathology/instruments-equipment/corporations-electronic-healthrecords.htm, President Bush’s goal to have EMRs available to everyone in the United States by 2014 did not look so unreasonable. The need for laboratories to link into the physician’s EMR (electronic medical records) system is fast becoming a competitive requirement to win and retain big clients.

Across the United States, the nation’s largest medical clinics and physician group practices are implementing EMR systems. These clinics and groups typically refer the greatest number of specimens to their laboratory providers. As physicians in these clinics and groups begin using EMRs in their daily practice, they want to electronically connect to their laboratory provider for lab test ordering and results reporting.
In order not to lose these important client accounts, laboratories are taking active steps to create electronic “gateways” between their laboratory information system (LIS) and the physicians’ EMRs. Because speed in execution is often an important consideration, many labs are opting to have a third-party software vendor create the programming necessary to meet the physicians’ request.

Lab-to-physician-EMR gateways differ from the current generation of Web browser-based lab test ordering and results reporting systems. Today’s Web browser-based systems are created by the laboratory and are designed to interact with the existing LIS and the lab’s various rules engines. Ordering physicians access them through their Web browsers. It is not so simple when the laboratory wants to electronically connect to the physician’s EMR. Many EMR systems are designed to support direct computer physician order entry (CPOE), along with a clinical decision support system, and a clinical knowledge data base.

Because physicians are working within their EMR system as they see a patient, they want the ability to order tests directly from the screen of their EMR. Similarly, they want laboratory test results to be automatically downloaded into the EMR and to populate the individual medical records in the format required by that EMR system.

Both of these requirements complicate the task of the laboratory when it wants to electronically enable lab test ordering and results reporting between its LIS and the client doctor’s EMR. The lab’s software vendor needs to write an interface that allows the EMR to build lab test orders consistent with the laboratory’s test catalog and ordering rules. Another complicating factor is that each different EMR system requires the laboratory to create a customized gateway between its LIS and the physician’s EMR system.
Combined, these factors explain why many independent labs and hospital laboratory outreach programs are actively developing interface gateways. To compete successfully for office-based physician clients, it is fast becoming a competitive requirement to provide clients with an LIS-to-EMR gateway interface.

It should be noted, however, that not all laboratories will be ready for an EMR instantaneously. There are a number of good reasons to put off adoption. In an article entitled Interested in EMR software? Look before you leap http://www.acponline.org/journals/news/oct03/emr_software.htm, Jerome Carter, FACP, outlines many of the pros and cons of adopting an EMR system. He acknowledges that there are many things to consider before spending the money on such a system and the purchase does not make sense for every practice or laboratory.

The first significant barrier to successful implementation of an EMR system is staff turnover. EMR systems cannot be learned overnight and a laboratory needs to have trained staff that stays in place to keep the EMR system working efficiently. Another barrier to EMR success is data entry. Pathologists and laboratory staff must agree on rules detailing how notes will be entered and follow the rules they create. A final barrier to EMR success is physicians themselves. It takes time to enter information into an EMR system, especially initially, so pathologists will need to block off additional time out of their day for data entry activities.
Eventually, all laboratories will need an EMR system. However, many doctors have been slow to adopt EMRs (see Slow EHR Adoption from Doctors Affects E-Connectivity of Labs http://www.darkdaily.com/laboratory-pathology/compliance-legal-malpractice/slow-ehr-econnectivity.htm). Laboratories should take careful inventory of whether the physicians they work with are already using EMRs and which systems they use before making an investment in an EMR system.
Trend #4
High-Deductible Health Plans Continue to Gain Enrollment

Enrollment in consumer-directed health plans (CDHPs) and health savings accounts (HSAs) grew steadily, if not spectacularly, over the past 12 months. UnitedHealth Group announced growth increases of 75% in its CDHP and HRA (Health Reimbursement Account) offerings for the period between June 2005 and June 2006. Membership in UnitedHealth Group consumer-driven health plans has now surpassed 1.75 million people (see UnitedHealth Group Reports Customers are Selecting CDHPs at a Rapid Pace). Moreover, research suggests that even consumers working for employers that still offer more traditional health insurance options like PPOs and HMOs are choosing to enroll in CDHPs.

This increased enrollment in CDHPs is a direct consequence of the recent policy change by employers and government health officials. The goal is to use consumer-directed health plans (CDHPs) to motivate consumers to become savvy purchasers of their health care. At the same time, employers and health plans would help make patients better consumers by giving them information about providers and treatment options. As this occurs, it is believed that the quality of health care will improve while the year-to-year increases in their health costs will be moderate.
Typically, a CDHP is a high-deductible health plan. Some CDHPs are combined with a tax-advantaged savings account, like an HSA or HRA (health reimbursement account). HSAs are employee-owned and fully portable, meaning workers can retain account balances if they leave their job. Both employees and employers can contribute to HSAs, but employer contributions are optional. (See The December 26, 2005 Dark Report issue on CDHPs.)

Forrester Research projects that CDHP enrollment levels, already at 2% of the insured population, will be 24% of insured beneficiaries by 2010. In a report issued by Celent Communications, HSA enrollment is expected to increase from about six million currently to 15 million by 2010 and 30 million in 2015, which would represent about 17% of the enrolled population.

What lab directors and pathologists should recognize is that the shift to CDHPs is the consumer movement growing from a different direction. During the second half of the 1990s, health policy makers believed that a steadily increasing number of activist consumers were going to “take charge” of their healthcare. That didn’t happen.

But now, seven years later, the role of the consumer in choosing his or her provider—and being responsible for direct payment of up to several thousand dollars to that provider—is growing. The driver behind this dramatic shift is the coordinated effort by employers and the federal government to make consumers the primary buyers of healthcare.
This is a trend which will not be derailed, for a simple reason: money. Neither employers nor the federal government can afford the year-to-year increases in the cost of health benefits. High-deductible health plans (HDHPs) and HSAs underpin a major healthcare cost containment effort. For that reason, it is likely efforts to expand CDHP enrollment will continue.
Trend #5

Emphasis on Outcomes Seen in Lab Accreditation Programs

Last fall, two significant developments gained little attention from the national media or the healthcare industry. First, the National Committee for Quality Assurance (NCQA), in Washington, D.C., released its 2006 State of Health Care Quality Report. This report documented continued improvement in the quality of health care on a large scale. It also demonstrated the need to apply its measurement systems to the entire American health system. NCQA noted that, for health plans providing HEDIS (Health Plan Employer Data and Information Set) data to NCQA, there was improvement in 35 out of 42 HEDIS measures of clinical care.

NCQA’s report is significant because it helps to establish a clear link between public reporting and quality improvement. NCQA notes that even a 2% increase in hypertension control rates means 82,000 more Americans have their blood pressure at acceptable levels, causing heart disease and stroke rates to drop. NCQA is not shy about extrapolating the benefits of improved healthcare. It says that as many as 150,000 deaths could be averted and as much as $100 billion could be saved each year if the entire U.S. health system raised its performance to the benchmark levels NCQA seeks for all health plans.
HEDIS data comes with a catch. Only 76 million of 176 million Americans in health plans are represented by the NCQA’s data. However, for the first time, PPOs (preferred provider organizations) now provide HEDIS data. During 2006, more than 80 PPOs, representing 14 million Americans, supplied HEDIS data to NCQA.

The second significant development involves accreditation inspections. Last year, the College of American Pathologists (CAP) began unannounced routine inspections for laboratories (see the February 27, 2006 Dark Report). The next logical step will be accreditation based on clinical outcomes. The Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) is already integrating outcomes and other performance measurement data into its accreditation process.

In addition, laboratories worldwide are seeking accreditation that helps them relate their regional performance to that of laboratories in other countries. One effective way to do so is to measure results based on clinical outcomes. Another source of change may be the growing use of international standards such as ISO 15189–Medical Laboratories.

For labs, hospitals, and other providers these trends foreshadow tightening accreditation standards. It is likely that accreditation bodies will seek outcomes data and ask that labs demonstrate improvement in specified outcomes from one inspection period to the next.
Trend #6
Provider “Pay for Performance” Is Now A Given

Last year, Dark Daily predicted that, before long, all laboratories and even individual pathologists will have a quality and outcomes scorecard. This year, pay-for-performance (P4P) went from being a subject that some physician associations criticized regularly to becoming an opportunity that could lift the professional and financial fortunes of physicians nationwide. Although the American Medical Association http://www.ama-assn.org/ (AMA) and other physician associations continue to critique the concept of physician pay-for-performance, they now acknowledge that P4P is inevitable.

The benefits of pay-for-performance are twofold. First, employers, payers, and patients can use the pay-for-performance scorecard to evaluate and select providers. Second, health insurers and government health programs can use measures of quality and outcomes to establish pay-for-performance programs. These programs will lead to pay-for-performance incentives for providers who meet and exceed the goals of such programs.

Pay-for-performance programs have the potential to radically reshape the anatomic pathology profession. As it stands now, government health programs and private payers have no effective way to measure the clinical effectiveness of pathologists and compare one to another. Even within the pathology profession, there is much debate about whether such a “rating system” could ever be developed. Regardless of debate within the pathology community, it is likely that healthcare’s drives to improve patient safety, reduce medical errors, and boost healthcare outcomes will lead to a solution for measuring the effectiveness of individual pathologists.
The reason that pathologist effectiveness must soon be measured is that across the American healthcare system there are researchers, payers, and provider organizations gathering measurement data in great detail. In some cases, this data is used to establish a patient safety baseline, and then measure progress at improving patient safety. In other cases, the measurements are part of evidence-based medicine projects. The goal with these projects is to determine the clinical effectiveness of the medical procedure being studied.

Measurements are at the heart of pay-for-performance programs and the Centers for Medicare and Medicaid Services http://www.cms.hhs.gov/ (CMS) will be a major factor in this trend. In recent months, CMS announced the results of the first full year of its three-year hospital pay-for-performance demonstration project. CMS has also launched a demonstration project for physician pay-for-performance. It is likely that the federal healthcare agency will report the first-year results, possibly as early as this summer.
Figure 6.1 shows an example of the pay-for-performance measure sets, by setting.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Type of measure</th>
<th>Example</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals</td>
<td>Process</td>
<td>Heart attack patients discharged with prescription for beta blockers</td>
<td>Medical records</td>
</tr>
<tr>
<td></td>
<td>Structure</td>
<td>Safe practices: Existence of pressure ulcer prevention programs</td>
<td>Web-based survey</td>
</tr>
<tr>
<td></td>
<td>Outcomes</td>
<td>Mortality (CABG, AMI), adverse events</td>
<td>Claims</td>
</tr>
<tr>
<td></td>
<td>Patient experience</td>
<td>HCAHPS: Whether patient understood the risk of their medication</td>
<td>Survey</td>
</tr>
<tr>
<td>Physicians</td>
<td>Structure</td>
<td>IT functionality: Whether the office has in place systems (e.g., patient registries) for tracking and following up on patients</td>
<td>Web-based survey</td>
</tr>
<tr>
<td></td>
<td>Process</td>
<td>Diabetic patients who receive certain diagnostic services (e.g., HbA1c tests)</td>
<td>Claims</td>
</tr>
<tr>
<td></td>
<td>Outcomes</td>
<td>Diabetic patients with good blood sugar control</td>
<td>Claims (with laboratory and prescription claims)</td>
</tr>
<tr>
<td>Home Health Agencies</td>
<td>Outcomes</td>
<td>OBQI: Patients who improved their ability to walk</td>
<td>OASIS assessment tool</td>
</tr>
<tr>
<td>Medicare Advantage plans</td>
<td>Process</td>
<td>HEDIS: Breast cancer screening</td>
<td>Medical records and claims</td>
</tr>
<tr>
<td></td>
<td>Patient experience</td>
<td>CAHPS: Difficulty in obtaining care when needed</td>
<td>Survey</td>
</tr>
<tr>
<td></td>
<td>Outcomes</td>
<td>HOS: Patients whose health status improved</td>
<td>Survey</td>
</tr>
<tr>
<td>Dialysis facilities and physicians</td>
<td>Outcomes</td>
<td>Patients with adequate dialysis</td>
<td>Medical records or claims</td>
</tr>
<tr>
<td></td>
<td>Process</td>
<td>Patients with fistula</td>
<td>Medical records or claims</td>
</tr>
</tbody>
</table>

Note: CABG (coronary artery bypass graft), AMI (acute myocardial infarction), H-CAHPS (Hospital-Consumer Assessment of Health Plans Survey), IT (information technology), HbA1c (hemoglobin A1c), OBQI (Outcome-Based Indicator), OASIS (Outcomes Assessment Information Set), HEDIS (Health Plan Employer Data and Information Set), CAHPS (Consumer Assessment of Health Plans Survey), HOS (Health Outcomes Survey).

Source: Analysis from MedPAC’s 2004 and 2005 Report to the Congress: Medicare Payment Policy.

Figure 6.1: Summary of potential pay-for-performance measure sets, by setting

As you can see, not only will it be important to complete all procedures by the book, but also to keep meticulous records of having done so.

Each item of data reviewed for pay-for-performance programs will be used for one or more measurements, as seen in Figure 6.2.
Many hospital process measures are endorsed or collected for multiple purposes

<table>
<thead>
<tr>
<th>Hospital quality measures</th>
<th>APU</th>
<th>HQA</th>
<th>JCAHO</th>
<th>Demonstration</th>
<th>NQF</th>
<th>QIO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acute myocardial infarction (AMI)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspirin at arrival</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Aspirin prescribed at discharge</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>ACE inhibitor for LVSD</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Adult smoking cessation advice/counsel</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Beta blocker at arrival</td>
<td>✓</td>
<td>✓</td>
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Note: APU (annual payment update), HQA (Hospital Quality Alliance), JCAHO (Joint Commission on Accreditation of Healthcare Organizations), NQF (National Quality Forum), QIO (Quality Improvement Organization), LVSD (left ventricular systolic dysfunction), PCI (percutaneous coronary intervention), CABG (coronary artery bypass graft), LDL (low-density lipoprotein), ACE (angiotensin-converting enzyme). QIO measures are from the 7th scope of work.

Source: MedPAC analysis, based on material prepared by the Iowa Foundation for Medical Care, from MedPAC’s 2005 Report to the Congress: Medicare Payment Policy.

Figure 6.2: Hospital quality measures and the purposes of their collection
As seen in Figure 6.2, certain accepted practices will be taken into consideration across the board and used to assess quality and effectiveness, leading to payment increases and continued endorsement from the program.

There is a good chance that providers will be measured in two different stages. In the first and current stage, the emphasis is on measuring whether clinicians consistently follow recommended guidelines when treating their patients. The goal is that all physicians consistently follow treatment guidelines with all their patients, all the time. This would reduce variability of care across different regions of the country and across different physicians. As that happens, the quality of care nationwide is expected to significantly increase.

The second stage of the measurement trend will be to measure the quality of outcomes by individual providers and physicians. Rankings will be published to help employers, payers, and patients decide select hospitals, physicians, pathologists, and laboratories. Medicare performance-based payments for physician groups have already begun. A pathology laboratory that pays close attention to the ways that pathology laboratories are being measured and ranked on outcomes can improve processes, earn itself favorable rankings, and secure new business from employers, payers, and patients who review rankings before selecting a pathology laboratory.

“The goal is that all physicians consistently follow treatment guidelines with all their patients, all the time.”
In June, AMA Secretary John H. Armstrong, M.D., said P4P could serve as a positive force in health care if designed to improve the effectiveness and safety of patient care. “Fair and ethical pay-for-performance programs are patient-centered and assess physician performance with evidence-based measures,” said Armstrong. In November, researchers from the Harvard School of Public Health http://www.hsph.harvard.edu/ published a study of P4P health plans offering commercial HMO products. Researchers determined that 52.1% of health plans—representing 81.3% of people enrolled in HMOs—already used physician pay-for-performance programs. More than half of the HMOs surveyed included P4P in their provider contracts.

These researchers reported that almost all physician P4P programs included measures of clinical care quality. The most common clinical care indicators measured use of asthma medication, diabetes care, and mammography. These specific indicators incorporate the appropriate use of evidence-based care. One interesting note was the discovery that about one third of physician-oriented incentive programs rewarded only the top-rated physicians or groups and not those who improved the most.
The important point here is that the debate is over about whether or not physician pay-for-performance programs should be implemented. P4P now has an accepted role in the American healthcare system. Going forward, laboratories and pathology group practices can expect to see two developments. First, as more physicians find a larger portion of their clinical services are covered by a P4P program, they will have a financial motivation to improve outcomes. That is likely to encourage them to seek out laboratories and pathology groups that can provide the type of clinical support that can help them raise their outcomes and practice a more effective brand of medicine. Labs providing that higher level of support should enjoy competitive advantage. Second, the day is approaching when pathologists and clinical laboratories will begin to see P4P clauses in their contracts with health insurers. That will position laboratory providers to benefit whenever they deliver improved outcomes to their clinicians and patients.
Trend #7
Skilled Labor Crisis Looms For Clinical Laboratory Industry

Last year, Dark Daily reported that a shortage of histotechnologists and sub-specialist pathologists was a problem for many would affect laboratories across the United States. This year, Dark Daily predicts that that shortage will expand to include medical technologists, cytotechnologists, histologists, and other professionals with the technical skills clinical labs need.

In order to attract qualified histotechnologists and sub-specialist pathologists, pathology laboratories may have to become very proactive in both educating new entrants to the profession and in recruiting experienced personnel. A similar shortage of adequately trained nurses has led private companies to pay college costs and offer attractive sign-on bonuses for nursing students. This trend is starting to emerge in the recruitment of histotechnology and pathology professionals.

In recent years, Business Week reported on the situation at New York Presbyterian Hospital http://www.nyp.org/ in New York City, which employs 15,000 people. To retain staff and attract new hires, histotechnologists, “who are paid about $43,000 to do tissue exams, got three extra salary adjustments totaling 13%” in addition to normal merit pay raises. The hospital has also increased employee tuition assistance to $10,000, an increase over the existing $2,000 level, for existing staff who will go back to school and learn these skills.
The skilled labor shortage has two primary consequences. First, in today’s tight labor market, many laboratories face a chronic shortage. They find it difficult—and sometimes impossible—to recruit and retain the FTEs authorized for their laboratories. Last year, the American Society for Clinical Pathology (ASCP) said almost half (44%) of all laboratories reported trouble finding medical laboratory personnel. Staff vacancies for certified medical technologists were highest in the West and Northeast.

Second, in the near future, the impending retirement of a large proportion of the laboratory workforce will exacerbate the shortage of technically trained labor. Anthony Williams, founder and CEO of the Histotech Exchange, LLC, a recruiting firm in Lexington, Virginia, told The Dark Report last year that 50% to 70% of histotechs were planning to retire within 10 years. In 2000, 13% of the U.S. workforce was 55 and older. By 2010, 17% of the workforce will be 55 and older. The youngest baby boomers were born in 1964, meaning critical shortages of qualified workers will soon occur. These are likely to affect service companies most severely, according to the AARP.

One major effect of the growing shortage of professionals for technical positions is increased labor costs. The ASCP survey reported that the median average hourly wage increased about 3.5% per year, while salaries rose about 7% between 2003 and 2005. Salaries tend to be higher in hospital and reference laboratories and lower in physicians’ office labs.
Another consequence of the labor shortage is that laboratories ask staff to work more hours. While most laboratories reported their staff worked 8-hour shifts last year, 30.5% of labs in the ASCP survey said work shifts could vary by four hours, adding to labor costs. There is no overnight solution to the shortage of skilled laboratory professionals. For one thing, existing training programs do not have the capacity to handle enough students to close the gap between demand for technologists and the supply.

The shortage of skilled laboratory professionals is one of the primary reasons why the use of automation and middleware in hospital laboratories has increased steadily over the past six years. Lab managers are taking steps to boost productivity as one way to cope with FTE vacancies that cannot be filled. Another consequence of short-staffed laboratories is that existing staff are asked to work longer hours per week. This raises the stress level and can contribute to erosion in quality and performance.
Trend #8
More Automation, Including Histology Solutions

Automation is steadily advancing in sophistication and usefulness. Automation is also moving into new areas of the laboratory. For example, histology is the latest section of laboratory operations to see multiple automated solutions hit the marketplace.

There are now multiple solutions for automation in the core laboratory, where high volumes of routine chemistry and hematology tests are performed. The same is becoming true for other areas of the laboratory, as in vitro diagnostic (IVD) manufacturers engineer automation features into instrument systems used from immunology to microbiology and histology.

The Dark Report The Dark Report was first to call attention to the impending introduction of automated systems for histology by several companies. During the past two years, these vendors began shipping their automated systems to laboratories (see The January 24, 2005 Dark Report http://www.darkreport.com/dark/01_24_2005.htm).

At the Executive War College for Laboratory and Pathology Management http://www.executivewarcollege.com/ in Miami, Florida in May 2006, a special one-day program was organized around automation in the histology laboratory. Some of the earliest laboratory users of the next-generation products from Dako http://www.dakousa.com/, Sakura Finetek http://www.sakuraus.com/, and Ventana Medical Systems http://www.ventanamed.com/ reported on their experiences.
What motivated these first-mover laboratories to acquire and use automated histology systems was a combination of two factors. One, use of automation was a labor substitution strategy. Recognizing the acute shortage to skilled histotechnologists in their community, these laboratories were willing to invest in automation as a way to improve the productivity of the existing staff. Two, these first-mover laboratories recognized that quality standards in laboratory operations are tightening. Their use of automation in the histology laboratory was expected to reduce variability in work process, cut the rate of errors, and improve the overall quality of the finished slides.

It is equally true that improving labor productivity and improving the quality of work processes have motivated clinical laboratories to acquire and deploy various automation solutions throughout the lab facility. In recent years, the clear preference has been to use targeted automation solutions over TLA (total laboratory automation). For these reasons, sales of pre-analytical automation, task-targeted automation, and consolidated workstation arrangements have been strong.

The arrival of automated solutions for histology is likely to shake up the status quo in multiple ways in clinical pathology laboratories. Until now, the histology laboratory has typically been organized around manual work processes. It is a labor-intense department within the laboratory organization. By contrast, the automated histology laboratory will be capital-intense. Up-front money is required to acquire the equipment, train the operators, and integrate the automated systems into the histology laboratory’s work flow.
Histology managers interested in deploying automation solutions should be ready to accept and understand two differences in their job responsibilities. One will be the need to develop a capital spending budget and convince higher-ups that investing money in histology automation solutions is both good medicine and good use of limited capital.

The other will be the need to acquire the management knowledge required to understand how automation works and how to design histology laboratory workflow to take best advantage of automation.

A case study of histology automation was written about the Kaiser Foundation Health Plan http://www.kaiserpermanente.org/ in Northwest Portland, Oregon. The objectives of incorporating automation into the histology laboratory of the facility were to improve patient care, maintain competitive performance of the facility, and make the facility a better place to work. After completing the length process of making a case for why the introduction of automated histology machines would be beneficial and cost effective, the facility purchased a number of machines including a Sakura Xpress http://www.sakura-americas.com/products/xpress.html (which reduced automated tissue processing time from 8 hours to 1 hour), a Sakura prisma stainer http://www.sakura-americas.com/products/prismafilm01.html for staining, a Ventana Nexes automated special stain instrument, and a Remstar automated storage system http://www.remstar.com/docs/products/tooling/index.html.
After the purchase, installation, validation, training, and initial use of these automated histology machines and processes were complete, the lab saw a significant increase in productivity and was able to further refine the processes for maximum efficiency. The workload results of the case study from 2001 to 2005 are shown in Figure 8.1.

Figure 8.1: Workload at histology laboratory Kaiser Permanente Northwest, Portland, Oregon.
(Presented at the [Executive War College](http://www.darkreport.com/ewc/) on Lab and Pathology Management, Miami, Florida, May 3-4, 2006.)
As seen in Figure 8.1, between 2001 and 2005, the numbers of blocks, slides, and IHC processed by the lab each year. Between 2004 and 2005, the number of blocks processed went from 109,355 to 121,263, and the number of slides went from 190,600 to 195,758. The increase in workload resulted from the lab’s ability to take on more work due to the implementation of automated histology processes, in addition to its acquiring work from new sources by building a solid reputation for being able to complete work in a timely manner.

It is uncertain how swiftly histologists will embrace automation. Although the popular conception of automation is that it replaces jobs, there is a different reality. Automation creates more jobs and requires more skills from the operators. Simply put, histologists, instead of performing manual procedures, will use their technical skills and medical knowledge for more sophisticated purposes. Certainly, the introduction of automation into the histology laboratory will change the daily work patterns of anatomic pathologists, but, in all likelihood, it will lead to increased productivity.

A final important benefit from automation in the histology laboratory is that automated systems will make it easier for laboratories to expand their menus of tests, stains, and the like, while improving quality and reducing turnaround time. These are favorable outcomes for both pathologists and the physicians who refer specimens to the histology laboratory.

Dark Daily predicts two things on the lab automation front. First, IVD manufacturers will continue to bring smaller and more productive automation products to market, increasing choices for lab directors. Second, the chronic shortage of medical technologists in most communities will continue to motivate laboratories to continually increase automation in their facility.
Trend #9
Fewer Laboratory Information Systems Upgrades Because Labs Opt for Middleware

This period in laboratory information systems might be characterized as the “middleware era.” In recent years, many laboratories have become heavy users of middleware solutions.

Middleware (also known as data management software or expert decision-making software) can provide an efficient system that decreases turnaround time, allows staff to focus on critical patient results for rapid response to clinicians, reduces potential for medical errors, improves patient safety, and eliminates process delays to create a “queueless” lab with efficient sample tracking. Middleware adequately mediates between laboratory instruments and the laboratory information system. It is a “patch” of sorts to bring an older laboratory up-to-date. We found an excellent article by Ron Berman about “Maximizing the Benefits of Lab Automation Systems with Advanced Middleware” that will certainly be of interest to our readers.
The source of the middleware solutions is often one of a handful of companies that specialize in middleware. One reason why laboratories no longer rely exclusively on their laboratory information system (LIS) and LIS vendor as the source for software solutions to operational needs is that hospitals and health systems are devoting ever-greater amounts of money to integration of their clinical data repositories and supporting an electronic medical record (EMR). The nation’s largest health informatics companies have responded to this spending priority by shifting resources away from upgrades and updates to their menu of software systems for laboratory, pharmacy, radiology, and other clinical services.

Thus, when many laboratories contact their LIS vendor about programming new functions, they learn it will take considerable money and many months to get that function programmed. That is why many laboratories turn to third-party software companies and ask them to write the software applications needed to accomplish the lab’s goals (see The June 12, 2006 Dark Report http://www.darkreport.com/dark/06_12_2006.htm).

This aptly describes that class of companies which sprang up to provide software and assistance to allow laboratories to enable Web browser-based lab test ordering and results reporting between physicians’ offices and labs over the past decade. Some examples of companies that provide this type of middleware are 4Medica http://www.4medica.com/, Atlas Medical Software http://www.atlasmedical.com/, CareEvolve http://www.careevolve.com/, Halfpenny Technologies http://www.halfpenny.com/, and Labtest.com http://www.labtest.com/.
Middleware vendors offering solutions to help laboratories in their daily operations and management have also emerged in recent years. Included in this category are companies such as Data Innovations (http://www.datainnovations.com/), Dawning Technologies (http://www.dawning.com/), Management Decision Systems (http://www.mdsisearch.com/), and Technidata America Medical Software (http://www.technidata-web.com/).

Middleware is a growing segment of the lab marketplace because lab directors and pathologists are seeking software solutions that will improve work flow through the laboratory and generate detailed data in real time. The goal is to give laboratory managers the information they need to quickly spot problems and more closely manage work processes.

These are not the only reasons why middleware is increasingly used to supplement and add functions to the existing LIS. Shortages of skilled laboratory labor, more sophisticated use of laboratory automation, and the need to more closely manage work processes are all contributing factors when we explore why the use of middleware is likely to increase steadily in future years.
Trend #10
Steady Increase in Number of Specialized Testing Labs

When it comes to independent laboratory companies, the business model on the upswing is that of the specialty lab test company. The number of lab firms offering specialized testing services, particularly where based on either patent-protected or proprietary technology, is growing steadily. This form of independent laboratory company has several important differences that distinguish it from the long-standing business model of the independent commercial lab company that provides routine testing services to office-based physicians.

Local independent lab companies providing routine testing services to office-based physicians have almost disappeared in most cities around the United States. In large measure, hospital laboratory outreach programs have stepped into this vacuum to become the local laboratory resource to the community (see Trend #2). When it comes to specialized laboratory tests, however, the marketplace is filling with new companies ready to offer reference and esoteric tests based on the patent-protected or proprietary technology they hold. In fact, this is one of the hottest growth areas for clinical diagnostics.

It must be noted that many of these specialized laboratory companies are not clinical laboratories in the traditional sense. That is because the test menu they offer often involves both clinical pathology and anatomic pathology procedures. New genetic knowledge and rapid advances in technology are allowing biotech companies to identify disease markers, and then develop useful clinical assays that they can bring to market.
One of the earliest of these companies was Myriad Genetics http://www.myriad.com/, of Salt Lake City, Utah, which began offering its BRACAnalysis http://www.bracnow.com/ genetic test for hereditary breast and ovarian cancer in the late 1990s.

During the past 24 months, Genomic Health http://www.genomichealth.com/ of Redwood City, California and RedPath Integrated Pathology http://www.redpathip.com/ of Pittsburgh, Pennsylvania, both entered the market with patent-protected molecular pathology assays. Genomic Health’s Oncotype DX http://www.genomichealth.com/oncotyperesults.aspx test is used to predict the likelihood of breast cancer recurrence and the likelihood of chemotherapy benefit in early-stage breast cancer patients. RedPath Integrated Pathology offers assays which aid in definitive diagnosis of pre-cancerous conditions, as well as guiding treatment decisions. Since their launch, both companies have seen a steady growth in specimen volume and revenue. Each company’s success demonstrates that the clinical market is ready to accept new diagnostic assays that are supported by clinical studies that provide evidence of their clinical usefulness.

Specialized lab test companies are likely to expand their share of the market. Over time, that will introduce new competitive dynamics into the lab testing marketplace.
Appendices
DARK Daily is a concise e-news/management briefing on timely topics in clinical laboratory and anatomic pathology group management. It is a solution to the dilemma facing anyone in the laboratory profession. New developments, new technology, and changing healthcare trends make it imperative to stay informed to be successful. At the same time, the Internet, cell phones, blackberries, laptop computers, and wireless devices are overwhelming any one individual’s ability to absorb this crushing Tsunami of data.

DARK Daily is a quick-to-read, easy-to-understand alert on some key development in laboratory medicine and laboratory management. It has no counterpart in the lab world. Why? Because it is produced and written by the experts at THE DARK REPORT and The Dark Intelligence Group, who know your world, understand your needs, and provide you with concised, processed intelligence on only those topics that are most important to you!

You will find DARK Daily to also be an exceptionally valuable resource in laboratory and pathology management. Some of the lab industry’s keenest minds and most effective experts will be offering their knowledge, their insights, and their recommendations on winning strategies and management methods. Many of these experts are unknown to most lab directors. As has proven true with THE DARK REPORT for more than a decade, DARK Daily will be your invaluable—and unmatched—resource, giving you access to the knowledge and experience of these accomplished lab industry professionals.
About The Dark Intelligence Group, Inc. and THE DARK REPORT

The Dark Intelligence Group, Inc. is a unique intelligence service, dedicated to providing high-level business, management, and market trend analysis to laboratory CEOs, COOs, CFOs, pathologists and senior-level lab industry executives. Membership is highly-prized by the lab industry’s leaders and early adopters. It allows them to share innovations and new knowledge in a confidential, non-competitive manner. This gives them first access to new knowledge, along with the expertise they can tap to keep their laboratory or pathology organization at the razor’s edge of top performance.

It offers qualified lab executives, pathologists, and industry vendors a rich store of knowledge, expertise, and resources that are unavai-

able elsewhere. Since its founding in 1996, The Dark Intelligence Group and THE DARK REPORT have played in instrumental role in supporting the success of some of the nation’s best-performing, most profitable laboratory organizations.

The Dark Intelligence Group (TDIG) is headquartered in Austin, Texas. This location makes it very accessible for any laboratory organization seeking input, insight, and support in developing their business operations, creating effective business strategies, and crafting effective sales and marketing programs that consistently generate new volumes of specimens and increasing new profits. The Dark Intelligence Group, Inc. owns and operates two Websites in the TDIG Website network:

http://www.DarkDaily.com
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About the Executive War College on Laboratory and Pathology Management

Every spring since 1996, the lab industry’s best and brightest gather at the Executive War College on Laboratory and Pathology Management to learn, to share, and to network. Many consider it to be the premier source of innovation and excellence in laboratory and pathology management.

Each year, a carefully selected line-up of laboratory leaders and innovators tell the story of how their laboratories are solving problems, tackling the toughest challenges in lab medicine, and seizing opportunities to improve clinical care and boost financial performance. The Executive War College is the place to get practical advice and solutions for the toughest lab management challenges. A unique case study format brings participants face-to-face with their most successful peers. They tell, first hand, how their laboratory solved intractable problems and successfully used new technology.

Many lab management secrets are shared, along with specific “what-not-to-do’s” gained from hard-won experience! It’s not pie-in-the-sky theory, but useful knowledge that can be put to use in any. The Executive War College offers superlative networking, with lab administrators and pathologists attending from countries as far away as the United Kingdom, Germany, Brazil, and Australia. It makes the Executive War College a melting pot for all the best ideas, new lab technologies, and management strategies now reshaping the laboratory industry. It’s also become a recruiting ground used by head-hunters and major lab organizations.

In the United Kingdom, The Dark Intelligence Group and the Association of Clinical Biochemists (ACB) have co-produced a meeting every February since 2003. Known at Frontiers in Laboratory Medicine (FiLM), it attracts laboratory leaders and innovators in the United Kingdom. Also featuring a case study format, this meeting pioneered the international laboratory side-by-side case study, where a North American laboratory and a United Kingdom laboratory prepare a comparison of best practices and an operational assessment of their two organizations.
In September 2005, a laboratory management meeting called *Executive Edge* was conducted in Toronto, Ontario, Canada by The Dark Intelligence Group and QSE Consulting. It provided pathologists and lab directors in Canada with a customized meeting devoted to the strategic and operational issues of laboratory management in Canada. This meeting will again take place in September 2007.
About Robert L. Michel

Robert L. Michel is a respected commentator, consultant, author, editor, speaker, and entrepreneur. He is a leading expert on the management of clinical laboratories and anatomic pathology group practices. He has been called “Quotes to follow from MLO” etc.

Lab Industry Leader and Consultant

Michel is Editor-In-Chief of The Dark Report and President of The Dark Intelligence Group, Inc. Over the past three decades, he has provided strategic and tactical management services to a wide variety of companies, ranging from Fortune 100 firms like Procter & Gamble and Financial Corp. of America to leading laboratories ranging from Nichols Institute to hospital and health system laboratory organizations. He has a special talent for spotting new business opportunities in clinical diagnostics and identifying winning strategies to pursue them.

Some of his current and past clients include: Meridia Health System (Cleveland, OH), PACLAB Regional Laboratory Network (Seattle, WA), Consultants in Laboratory Medicine (Toledo, OH), PAML, Inc. (Spokane, WA), UMASS Healthcare Reference Laboratories (Worcester, MA), Ortho-Clinical Diagnostics (Raritan, NJ), Pathology Service Associates (Florence, SC), DIANON Systems, Inc, (Stratford, CT), Beaumont Health System (Detroit, MI), MedTox Laboratories, Inc. (St. Paul, MN), Joint Venture Hospital Laboratory Network (Detroit, MI), Bayer Diagnostics (Tarrytown, NY), Bio-Reference Laboratories, Inc. (Elmwood Park, NJ), Specialty Laboratories, Inc., (Santa Monica, CA), National Health Service-Pathology Services (London, England), Doctor’s Laboratory (Valdosta, GA), Sysmex Corporation (Mundelein, IL), Pathologist’s Medical Laboratory (La Jolla, CA), Abbott Laboratories (Abbott Park, IL), St. John Clinical Laboratory Pathology Laboratory (Detroit, MI), Esoterix, Inc. (Austin, TX), Beckman Coulter Corporation (Fullerton, CA), Health Care Systems, Johnson & Johnson (Atlanta, GA), ARUP Laboratories, Inc. (Salt Lake City, UT), Institute for Quality in Laboratory Medicine (IQLM-Atlanta, GA), Association of Clinical Pathology (ASCP-Chicago, IL).
Michel is a member of the Clinical Laboratory Management Association (CLMA), the American Association of Clinical Chemistry (AACC), Specialized Information Publishers Association (SIPA).

**Popular Journalist, Author & Editor**

Michel writes and edits The Dark Report, a business intelligence service for pathologists and laboratory executives that, over its eleven years of publication, has garnered national and international respect of its ground-breaking coverage of events and industry trends within the laboratory profession. He has been interviewed or quoted in such publications as: RLM to provide.

**International Meeting Innovator, Public Speaker**

Michel is the Founder and Director of the Executive War College on Lab and Pathology Management. First conducted in 1996, this gathering has become the premier forum for laboratory management in the world. For pathologists, he developed the “Pathologist’s Income Symposium,” a meeting series which is exclusively focused on helping pathologists increase their practice income, as well as their professional income. Since 2004, he has co-produced Frontiers in Laboratory Medicine (FiLM) in the United Kingdom with the Association of Clinical Biochemists. This meeting has quickly earned a reputation as the best source of laboratory best practices in Europe. In 2005, Michel co-produced Executive Edge in Canada with QSE Consulting. This meeting about strategic laboratory management innovations in Canada proved popular and will be repeated in the fall of 2007.

Michel is regularly asked to address laboratory industry groups. In addition to regular speaking engagements through the United States, he has traveled to Brazil, England, Canada, Australia, and Korea to address laboratory audiences in those countries. Meeting participants regularly rate Michel’s presentations as one of the best at the event.
Experienced Educator, Strategist, and Business Facilitator

Over the past decade and a half, Michel has been invited to provide Grand Rounds and teach clinical laboratory and pathology management at the pathology departments of such medical schools as University of Minnesota, University of California at Los Angeles and University of Texas Southwest/Houston. He has provided strategic assessments to laboratory organizations, IVD manufacturers, pathology groups, information technology vendors, biotech companies, and diagnostic start-up companies. He is regularly asked to facilitate strategic management retreats and business planning meetings for such clients as PAML, OML, Sysmex Corporation. etc...(add more)

Michel received his B.A. in Economics from the University of California at Los Angeles. He is a native of Santa Ana, California and currently lives and works in Austin, Texas.
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About Sylvia Christensen

Sylvia Christensen is a freelance technical editor, researcher, and writer. She has worked on user guides, training manuals, and marketing and press materials for The Photodex Corporation, National Instruments, Encotech Engineering, Tk20, and Axxiom Technologies. She is currently a contributing editor to DARK Daily, the online subscription resource dedicated to helping provide relevant information and insight to pathology laboratories.

Sylvia currently provides articles to numerous websites that compare and review consumer products and continues to provide written documentation and marketing materials to select companies in Austin, and California. In addition to written content, Sylvia creates interactive demo and training CDs for software companies show how their products work. She also provides voiceover talent for technical and marketing materials.

Sylvia received her B.A. in English from the University of Texas at Austin and her M.S. in advertising from the University of Illinois at Urbana-Champaign. Her base of operations is Austin, Texas.