

COLA'S

# inSights

## INTO *Getting it Right*

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## FROM THE CHAIR



Bradley J. Fedderly, MD, FAAFP,  
Chair, COLA Board of Directors

Basic factors that contribute to the delivery of quality patient care by the laboratory include offering the appropriate menu of tests required by clinicians, using instrumentation that provides accurate test results in a timely manner, and having a well-trained, competent and committed team; all overseen by engaged laboratory management.

This issue of COLA Insights focuses on how these factors interplay to create a quality lab, and the important and expanding physician consultation role of laboratory professionals.

The initial article, "The Right Tests, The Right Instruments, The Right Team: Managing Change" is an overview of the steps involved in implementing changes to the test menu and instrumentation. These include the need for strategic planning, which includes the performance of cost/benefit analyses; consultation with clinicians for their input, and ensuring staff involvement in the planning process. This also means active engagement by the laboratory management team.

This is followed by three separate discussions that highlight each of these factors in greater detail.

We begin with a discussion of steps to take to achieve effective team building. You cannot achieve quality lab services based on good instrumentation alone; it takes a well trained staff who can work together as a team, for the work to flow smoothly. These "Six Important Steps of Team Building" include staff having an understanding of their professional commitment and of organizational goals; understanding their roles in the laboratory and their responsibilities to their co-workers; agreeing to rules of behavior and decision-making, and guidelines for effective communication. All these heavily impact the work routine and contribute to creating a culture of quality.

We then discuss decision-making strategies for choosing the right (appropriate) automation for your laboratory. These include determining both present and future needs of the laboratory; possible changes to the test menu; workspace and budgetary considerations; maintenance and reagent needs; staffing requirements, and data handling. Finally, some very exciting future trends in laboratory automation are listed.

We close this issue with a discussion of how the process of test utilization management is the most effective way to achieve value testing that is also cost-effective by advising clinicians of the most appropriate tests to order for their patients. This involves active communication and trust between laboratory professionals and the medical staff, with the result being quality service.

*Bradley J. Fedderly, MD*



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## The Right Tests - The Right Instruments-The Right Team: Managing Change

### Introduction

In recent decades the role of medical laboratories in the delivery of healthcare has undergone dramatic change. The availability of real-time laboratory results and more effective tests, the enhanced laboratory consulting role, the involvement in therapeutic decisions, the efforts to prevent rather than cure disease, the shift to evidence-based medicine, and the assessment of outcomes for laboratory tests have all contributed to the changing role and duties of medical laboratories<sup>1</sup>.

As a consequence, the role of laboratory professionals has had to change as well. Crucial elements in sustaining these changes are the ability of laboratory professionals to guarantee the quality of laboratory tests irrespective of where they are performed; improve the quality of services; improve clinical outcomes; and perform joint clinical/laboratory research projects. A key factor in sustaining these changes is the increased awareness of the need to provide for additional training of laboratory professionals<sup>1</sup>.

As a result of these profound changes in the role of the laboratory and of the professionals who provide the services offered, decisions that affect the continued operation of the laboratory, especially in planning a new facility, must be made with all these considerations in mind. Despite all these changes, the basic building blocks for a successful laboratory operation remain the same: the tests offered, the test systems utilized to provide accurate test results in a timely manner, and support by competent staff; all overseen and organized through competent management.

Decisions concerning the best selection of tests to perform, the best instrumentation to use, and the optimum level of staffing required to ensure quality and timely service, should not be made without sound strategic planning that will guide operations and ensure financial viability. It is through strategic planning that goals are set, performance measures are established, and resources and approvals are obtained to move forward<sup>2</sup>.

### The Right Tests / The Right Instrumentation

When we use terms like "right tests", or "right instrumentation", what we really mean is "effective utilization". That is, the services offered by the medical laboratory are only right if they meet the needs of the clinicians who order these tests.

In the past, when the clinical diagnostic world was less complicated than today, primary care physicians could easily keep up with the handful of key lab tests needed to diagnose most conditions they would run across in everyday patient care. Today, there are literally thousands of laboratory tests that clinicians might request as they evaluate a particular patient, and because of the number and the complexity of these tests, physicians are realizing that they have gaps in their knowledge and understanding of these assays; increasingly, for physicians to be familiar with the ordering, interpreting, and timing of both old and new tests, is a daunting task. However, laboratory professionals *do* know these tests, and can play an active role in helping the patient get the right diagnosis at the right time by improving the understanding and utilization of lab tests by the ordering physicians. Such test utilization management can be a strategy for encouraging the use of appropriate laboratory and pathology testing with the goal of providing high-quality, cost-effective patient care<sup>3</sup>.

Laboratory professionals, in particular, Clinical Consultants, need to be fully engaged in any test utilization process, and be able to question clinicians' test requests, suggest appropriate tests to answer the clinical question being asked, and cancel test orders when they are inappropriate for the question at hand. It is the laboratory's responsibility to identify utilization issues, implement a program that will achieve more effective laboratory testing, and establish processes from the beginning to the end of the testing cycle that lead to a successful laboratory test utilization program<sup>4</sup>. It is important to do a realistic assessment of not only what tests you *want* to offer, but what you *can* realistically offer. Laboratory clinical consultants have increasingly assumed this responsibility because they have the medical and clinical background to understand the contextual background of the individual patient's particular circumstances, and can thus provide the most effective assistance to the attending physician. In fact, clinical consultants have specific CLIA defined responsibilities to provide consultation regarding the appropriateness of the testing ordered, and interpretation of the test results<sup>4</sup>.

### Perform a Cost/Benefit Analysis<sup>5</sup>

When there are proposed changes to the test menu and instrumentation, it is important to perform an honest cost/benefit analysis. By taking into account the internal as well

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**THE RIGHT TESTS - THE RIGHT INSTRUMENTS-THE RIGHT TEAM: MANAGING CHANGE**

as external factors in the laboratory environment, the decisions made will have the best chance of success.

Below are items to consider for your cost/benefit analysis:

- Instrument capacity for current or proposed test menu (is it “right-sized” for test volume and level of staffing?)
- Instrument cost (purchase or lease?)
- Reagent cost (are you obligated to purchase reagents from a particular manufacturer?)
- Reagent life (expiration dates: days, weeks, months before/after opening packages)
- Storage requirements for reagents (do you need to buy a new refrigerator or freezer?)
- Frequency and expense of Quality Controls, Calibration, and Maintenance
- Tests run singly or in batch mode?
- Comparison of in-house testing with reference laboratory charges and turn-around time
- Staffing requirements: number, training expenses; qualifications and experience beyond present staffing; continuing education
- Proficiency Testing requirements
- Facility space, ventilation, electrical needs and hazardous disposal requirements
- Time and involvement of the Lab Director, and the Technical Consultant
- Document storage requirements / LIS capability
- Adjusting the front office staffing to handle additional pre and post analytical paperwork and communications

Providing the highest level of service for your patients may justify costs associated with the above considerations, but you must make sure that your instrumentation can handle the projected demand in terms of test volume capacity, variety of tests offered, operating times and staffing. But be aware that having a laboratory with excess capacity and operating requirements can ultimately bankrupt a practice.

**The Right Team**

The third key factor for a successful laboratory is staffing, and making sure that you have the right team in place. What do we mean by the “right team”? In this case, “right” means qualified, competent, and dedicated staff, able to work together. Staffing should be carefully indexed to the number of hours the laboratory is operating, the number of shifts,

the responsibilities of each shift, the complexity of work performed, testing volume, whether patients are drawn on-site, the type of instrumentation, and expected test turn-around time.

Your staff should be encouraged to provide comprehensive and meaningful feedback to the management team, identifying laboratory errors and potential risks, recommending improvements to the laboratory operation, as well as performing all the tasks needed to achieve the highest level of quality for the laboratory. It is the responsibility of the management to hire, train, and keep good staff, and create a sense of shared teamwork, commitment, and competency.

In general, the laboratory staff includes the laboratory director, clinical consultant and technical consultants/supervisors, and a mix of laboratory technicians, laboratory technologists, medical assistants, and non-technical personnel. The presence of some of these roles may vary, dependent upon if the laboratory is certified for waived, moderately complex, or highly complex testing. CMS and state educational qualifications and certifications for the laboratory staff must be met.

**The Key Role of Management**

Before you can have effective planning in place, you’ve got to have competent management of the laboratory. It is through these skills that you earn the confidence and loyalty of your staff, build a culture of teamwork, trust and quality, and can implement change with minimal disruption.

Competent laboratory management includes effective communication with the staff; providing key information and direction for the continuing future development of the laboratory; and encouraging involvement in the development of strategic plans.

A successful manager can motivate their staff to provide feedback about their workload, instruments and kits used; to make suggestions for improvement of, and changes to, their test menu; and to provide information about interactions with other offices, departments, physicians, and patients<sup>6</sup>. These types of information play an important role when developing strategies for cost containment, growth, re-alignment, and even repositioning of the lab in the community; in effect, for having the right tests, the right instruments and the right team in place to provide high quality cost effective laboratory services.

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## Effective Team Building

**Introduction**

There is an old saying that the “whole is greater than the sum of its parts”. This applies to many situations of course, but we often do not appreciate how relevant this is for team building in our laboratories, regardless of size. In particular, when we discuss the importance of having the right staff, with the ability to work together across disciplines, across shifts and across levels of responsibility, we are talking about what enables the laboratory to provide exceptional quality service. Effective team building ensures the most efficiency, the most responsive customer service, and operational consistency regardless of day to day variations in workload.

While it may appear that team building would be most applicable to larger, departmentalized laboratories, it is just as effective for smaller laboratories, including physician office labs (POLs). All it takes is the realization that “teaming” can be expanded to include all practice staff who interact with the laboratory, from nurses, to respiratory and physical therapists, to medical record personnel and to office receptionists, as well as to medical assistants. We must all work together for the benefit of the patient.

**The Six Important Steps of Team Building<sup>1</sup>**

Six items are crucial to help laboratory teams function effectively.

**1. Mission**

It is the shared commitment to the lab’s mission that helps define a team. This requires team members to think about, discuss and come to terms with the following:

- Our responsibilities for the work we were hired to do
- The advantages of a team approach to the testing process / work flow

- Why working as a team enhances the quality of our work

**2. Goals**

A defined mission gives a team guiding principles, but goals give the team a real target for their activity. Goals should be something worth striving for -- important results that the team can provide for the laboratory.

The best goals are **S-M-A-R-T** goals: **Specific, Measurable, Achievable, Relevant and Time-bound**. For example, “Improving Test Turn Around Times” may sound like a good goal for a team, but it doesn’t really meet the S-M-A-R-T criteria. A more effective goal would be “have routine 6 AM lab results for automated hematology and chemistry test results charted by 9 AM, 95% of the time within one month”. The revised goal is:

- Specific (chart automated chemistry and hematology 6 AM draws by 9 AM )
- Measurable (95% by 9 AM)
- Achievable (The team would need to decide this: e.g., 90% or 95%?)
- Relevant (responsive to complaints by physicians on morning rounds)
- Time bound (within one month)

**3. Roles and Responsibilities**

It’s particularly important in a lab environment that staff members know what is expected of each of them. Without these expectations, members can’t develop mutual accountability or trust in the team. When a team’s expectations are clear and members meet (or exceed) expectations, trust and an increased sense of “family” are natural by-products.

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#### 4. Ground Rules

To be effective, staff need to be clear about the ways they will work together. Ground rules are guidelines for specific behaviors. Teams don't need a lot of ground rules to work together well, but everyone on the team should agree to the ground rules and share responsibility for ensuring that they are followed.

- Possible areas for ground rules may include:
- What constitutes respectful behavior towards others on the team?
- Break times: frequency and duration
- Audible music/ frequency of personal calls

#### 5. Decision-making

The decision-making model should be explicit and understood by all team members. A clear decision making model describes the types of decisions involved, who makes the decisions and how others will be involved. (*Will decisions regarding changes to daily work routines be made by consensus where everyone can agree to support the final decision? Or will the supervisor or manager get input but make the final decision?*) Knowing what decision-making model will be used lets team members know what to expect and what is expected; this can help build support for the final decision.

Good decisions have two characteristics: quality and commitment. Quality decisions are logical, supported by sound reasoning and good information. Steps towards making quality decisions include checking to see if all available information has been gathered and shared, that all team members have been consulted, and that critical input from stakeholders (individuals or groups affected by the decision) outside the team has been considered as appropriate.

Commitment is demonstrated by the active support for the decision by every team member. Each team member agrees with the decision, is committed to carrying out the decision, and understands their individual role in doing so.

#### 6. Effective Group Process

##### Communication:

Using ground rules as a starting point, the lab team, led by involved management, needs to encourage and model open communication. Examples include:

1. Listen respectfully and respond with positive interest to ideas from team members.
2. Help create an environment that encourages team members to share all ideas - even the "half-baked" ones. Treating every idea as important keeps team members from holding back some "half-baked" thought that could be just what the team needed.
3. Don't hide conflicts; acknowledge differences and use them to create better results that all can support.

##### Mutual Accountability:

Each member of a team is responsible for the success of the team as a whole. This is the interdependence that makes teams stronger than the sum of their parts. Working together towards specific tangible results is the best way to start creating mutual accountability.

##### **In conclusion,**

The "right" staff are hard to find, and even harder to replace. The most highly valued aspects of the work environment aren't the wages or the perks, but having positive, supportive relationships with coworkers, recognition of achievement, pride in the organization, and opportunities for advancement<sup>2</sup>. Successful team building provides the surest pathway to realizing these goals.

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## The Right Level of Automation For Your Lab

Automation has long been regarded as an important means for clinical laboratories to achieve greater operational efficiency, test accuracy, method standardization, total data handling and reduced turnaround time; in short, an improved quality of patient care.

Increasing competition and demands for higher levels of performance means that the need for automation has become ever more essential. Until recently, the expense and complexity of an integrated laboratory automation solution have been a deterrent to implementing automated systems of any kind. However, current generations of automated equipment do not require commitment to total lab automation, and may include modules designed to automate only a portion of a laboratory's operations. This development of new generations of automated stand-alone and bench top equipment has made automation a more viable option for labs of all sizes—and in many cases, a necessary option for labs seeking to remain competitive in today's marketplace. As a result, today's clinical laboratories are increasingly adopting flexible bench top automation tailored toward their needs of today, but adaptable to their needs of tomorrow. Modular automation allows recombination of modules as the needs of the laboratory change<sup>1</sup>.

### Steps for Achieving the Right Automation for Your Laboratory <sup>2</sup>

#### A. Considerations for adding automation to your laboratory

Begin by determining what you want to achieve by adding automation to your laboratory. While the advantages of automation are obvious in terms of achieving sample throughput, test reproducibility, time and reagent savings, all of which translate to cost savings (direct benefits), there are also some indirect benefits to automation, including reagent stability, data generation, transfer and storage; assay time, smaller samples, and new patterns of staffing. Have you factored in these effects of these benefits on your laboratory when determining the type and extent of automation under consideration?

#### B. Questions to ask when deciding how much automation is needed laboratory

How much automation you need depends on the type and size of your laboratory. Some considerations include answers to the following questions: are you in a physician's

office lab, a clinic lab, a specialty lab, a hospital or reference lab? Are you in a stand alone lab or a centralized core lab? What are the number and types of specialties tested? And what is the extent of automation already present? If you are in a centralized high-throughput lab, then you should consider an integrated robotic system, with good test management coupled to a robust Laboratory Information Management System (LIMS). If all you are looking for is increased throughput and you don't really have to deal with diverse assays and readouts, then you might want to think about modular components. So with a few nonintegrated pieces of equipment, you can get the throughput you need without a huge investment, or additional space required.

#### C. Seek assistance to determine the level and type of automation that best serves your needs

Once your operational goals are defined, talk to fellow professionals and industry representatives about the types of automation available; attend conferences that have exhibits of laboratory instruments and systems; and visit area labs if they have systems that interest you. Get critical information related to versatility, robustness, technical support and training; this is going to be very important in getting the infrastructure up and running.

#### D. Set priorities for automation based on realistic budget limitations

Once you have determined your needs, spoken to vendors and told them what you are looking for, start getting quotes on systems needed. Budget negotiations will then occur, with sets of reality checks on what is doable and what is not. You may not get everything you want; but decisions should be based on priorities set in advance.

#### E. A few more points to remember

Always choose a vendor who can provide prompt, affordable service to minimize any downtime. Establishing good relationships with the vendors is critical for the smooth day to-day running of these instruments. Sometimes, people forget about the data management involved. There are different sets of tools for data processing, data mining and data visualization, and you need to think about how you are going to track and analyze this data. Finally, think about automation beyond your current application and build an infrastructure that can be easily modified or expanded for other applications.

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### F. Plan for downtime for routine maintenance and equipment breakdown

With time and experience, you can estimate how much “buffer” time you need to build in for preventive maintenance and downtime. In a centralized core lab, you can get historical data to help you plan things out and have good backup systems in place. Having an infrastructure to minimize downtime is critical.

### G. Consider purchasing a service contract<sup>3</sup>

An additional consideration is whether to buy a service contract. A service contract can include many services beyond a general warranty, such as software updates, calibration, certification, preventative maintenance, priority service, and/or additional discounts on upgrades. Service contracts can be costly, and you can either discuss options with colleagues or make your own informed decision. Several reasons why you may chose to purchase a service contract could include reduced hassles if your equipment breaks, faster/priority repairs and a predictable expense in your budget. If a piece of equipment is critical to your work, you use it frequently, and major repairs are very expensive, a service contract may be worthwhile. In terms of budget, you will know exactly what you are going to pay in advance and will not be blindsided with a major “surprise” expense. On the other hand, you may end up paying for services that you never use and therefore paid for “peace of mind,” which would extend beyond the typical one year warranty.

### Trending now

**Total Laboratory Automation (TLA) through Robotics<sup>4</sup>:** A shift is happening towards total automation systems that brings almost all testing programmed to a single track that utilizes robotic assortment of all received specimens to all connected testing systems simultaneously. This adds tremendous efficiency to all phases of the testing process, especially for larger hospital and reference laboratory operations, and as well as for core laboratory systems.

**Radio Frequency Identification (RFID)<sup>5</sup>:** Radio-frequency identification (RFID) is a wireless non-contact use of radio-frequency electromagnetic fields that transfer data, for the purposes of automatically identifying and tracking tags containing electronically stored information, attached to objects. This technology offers real time visibility that barcode systems currently lack. Current RFID used in the healthcare and hospital setting are seen in patient

monitoring, asset management, equipment tracking, EMR data collection, waste management and sample tracking.

In the laboratory, inventory management software with RFID technology is just starting to be adopted. Several well known vendors are now marketing this technology to automate the lab inventory monitoring, tracking, stocking and ordering processes. The system will track key laboratory supplies such as reagents, calibrators and controls.

### Future trends in laboratory automation

The future of automation is driven by the need to do more with less, as lab budgets are reduced and staffing shortages increase. In order to better allocate skilled resources in the lab, newer automation systems will be able to more efficiently handle the tedious, and sometimes hazardous, tasks while skilled laboratory professionals are able to focus on important matters that require human interaction.

As a result, the trend is to buy smaller integrated systems that are more flexible and will allow labs to accommodate more options for testing, and faster throughput; systems that are “fit for purpose”. The large, centralized labs may still rely on big integrated systems, but for others, the flexibility to adapt to different assays is becoming more important<sup>6</sup>.

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# The Right Tests Through Utilization Management

### Introduction

The test menu of any laboratory should reflect the needs of the clinicians utilizing that laboratory. However, the clinical laboratory has an important role in ensuring that laboratory tests ordered are appropriately utilized in clinical practice. Laboratories are discovering that they are well positioned to provide medical guidance and direction for clinicians who are trying to maneuver their way through the increasingly complex world of laboratory testing. To efficiently manage laboratory test utilization requires both ensuring adequate utilization of needed tests in some patients and discouraging superfluous tests in other patients. Such test utilization management is a key strategy for providing high-quality, cost-effective patient care .

Before we go further, below is a list of some of the questions that must be answered in order to choose the most appropriate test menu for any clinical laboratory:

- **Type of laboratory** (physician office, reference, hospital, mobile, clinic, etc.)
- **Type of patient population served** (related to physician clients, and specialties represented)
- **Types of client physicians / medical specialties** represented
- **Anticipated test volumes / demand** for specific tests
- **Complexity of testing** (waived vs. non-waived, with attendant regulatory requirements)
- **Qualifications of personnel** required
- **Hours of operation with attendant staffing levels / testing performed per shift / committed turn-around times**
- **Operating and capital budgets** (determinant for extent of instrumentation and level of automation)
- **Work space available** to accommodate all phases of testing from specimen collection to test result reporting

The answers to these questions will provide the guidance for testing that can be accommodated in-house, what tests should be sent out, the expectations of the physicians, and the needs of the patients. The next step is to work with the physicians on a test utilization program to encourage the most efficient and relevant utilization of the testing offered.

Laboratory professionals need to be fully engaged with

clinicians for any test utilization process to succeed, and to be able to question clinicians’ test requests, suggest appropriate tests to answer the clinical question being asked, and to cancel test orders when they are inappropriate for the question at hand.

In fact, clinical laboratory consulting has now become an integral and necessary part of the routine laboratory services offered, and with that, the CLIA-defined role and responsibilities of the Clinical Consultant are increasingly vital.

### The Test Utilization Process:

#### Determining the most appropriate tests for best patient care

A successful program requires a multipronged approach that must involve the clinician, the laboratory, and clinically engaged pathologists, laboratory directors, and clinical consultants.

A utilization management process actually starts when the clinician begins to consider what tests are needed to evaluate his or her patient—whether for diagnosis, follow-up, therapeutics, or exclusion of disease. Appropriate ordering depends on the clinician having the correct core knowledge to make that decision. The laboratory enters the process early on as it provides that clinician with the information to order the correct test.

After the test order or specimen is received in the laboratory, the laboratory professional can play a more active role in the test decision process. Clinical laboratories can use algorithms, test guidelines, and test formularies to put appropriate medical and utilization reviews in place.

### Suggested Process Steps:

1. **Provide important test information**  
This may include clinical indications, overall value of that test, test indications, et al. that are readily available for the ordering clinician to access.
2. **Requisition design**  
The redesigning of requisitions to provide more information, including ordering guidelines and data about previous tests, can contribute to the decision-making process.

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**THE RIGHT TESTS THROUGH UTILIZATION MANAGEMENT****3. Create a team of healthcare professionals in the organization to develop and enforce test ordering guidelines**

Build a team of representatives from nursing, laboratory, physician, and information systems, supported by the medical and nursing executive committees, to create rules governing laboratory test ordering, including algorithms and test-ordering guidelines. These can guide the clinician through a utilization process to enable appropriate test selection<sup>2</sup>.

**4. Use of test formularies patterned after the pharmaceutical model**

The laboratory test formulary is used to limit access to certain tests and often requires authorization from a pathologist, subspecialist, or laboratory committee before a particular test can be ordered.

**5. Auditing results**

This is a critical step in the utilization process. The laboratory generates a tremendous amount of data. When analyzed, this data can reveal how a test is being used, whether the intended outcome of a utilization process is being achieved, and where problems exist. The audit process can also identify which guidelines are not working as planned or need modifications or revisions.

**The Critical Role and Responsibilities of Clinical Consultants**

Physicians need the assistance of clinical consultants due to the increasing array and availability of tests. These laboratory professionals are in the unique position to provide the guidance to address the needs of physicians and provide the information necessary to achieve efficient utilization of laboratory services and to order appropriate tests. They should optimize their professional relationships with the clinicians who order laboratory tests for appropriate test ordering and interpretation.

The Academy of Clinical Laboratory Physicians and Scientists have recognized medical consultancy as a key competency of clinical pathologists and clinical consultants. Clinical consultancy may be practiced in several ways, such as implementation of reflex testing and diagnostic algorithms; providing patient-specific narrative interpretation of complex testing; providing probabilistic data related to laboratory results; organizing clinical audits;

participating in grand rounds in hospitals; eliminating obsolete tests; achieving consensus with clinicians on guidelines and standardization, and optimizing clinical pathways<sup>4</sup>.

Those in the CLIA defined position of Clinical Consultant have specific responsibilities outlined below that support these growing needs.

**These responsibilities include:** Providing consultation regarding the appropriateness of the testing ordered and interpretation of test results. The clinical consultant must:

- (a) Be available to provide clinical consultation to the laboratory's clients;
- (b) Be available to assist the laboratory's clients in ensuring that appropriate tests are ordered to meet the clinical expectations;
- (c) Ensure that reports of test results include pertinent information required for specific patient interpretation; and
- (d) Ensure that consultation is available and communicated to the laboratory's clients on matters related to the quality of the test results reported and their interpretation concerning specific patient conditions.

**Conclusion**

Every laboratory needs to design its own strategy for test utilization and find what best fits the structure and purpose of its institution. Laboratory professionals, including the clinical consultant, can assist clinicians with test ordering and ultimately improve the quality and efficiency of patient care. It takes trust-building to have these conversations with clinical colleagues in order to clarify information, cancel a test, or suggest ordering a different test, but these interactions are necessary in order to build a successful laboratory test utilization program that leads to high-quality, cost-effective care.

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## inSights SPOTLIGHT: LABORATORY EXCELLENCE AWARD

### SAN DIEGO STATE UNIVERSITY HEALTH SERVICES LAB

SAN DIEGO, CA

LABORATORY DIRECTOR:  
GREGG LICHTENSTEIN, M.D.

LABORATORY MANAGER:  
GALE SHIPLEY, CLS

We feel very fortunate to be able to come to work every day to a bright, modern laboratory here in sunny San Diego! We serve a student body of 33,000 at this growing public research university. Our facility employs 9 physicians and 6 Nurse Practitioners.

Our laboratory staff is made up of two full time Laboratory Assistant/Phlebotomists, one fulltime and one three-quarter time Clinical Laboratory Scientist, (as Medical Technologists are designated in California), one full time Laboratory/Radiology Manager, and our Laboratory Director. We are open five days a week, from Monday through Friday, 8:30 am to 5:30 pm.

Student Health Services offers a full range of laboratory services to our patients, including Hematology; Urinalysis; RPRs; rapid testing for Strep, Influenza and Mononucleosis; pregnancy tests and glucose monitoring. We perform routine

cultures on wounds, ears, eyes, noses, urine, genital sites, and strep screens on samples testing negative on the rapid strep test. We are fortunate to have the support of our campus Student Affairs department. They have recently helped us upgrade to a Sysmex XS1000i analyzer for CBCs with a 5-part differential, and a Roche Cobas 4800 PCR instrument that we are currently using to test for chlamydia and gonorrhea.

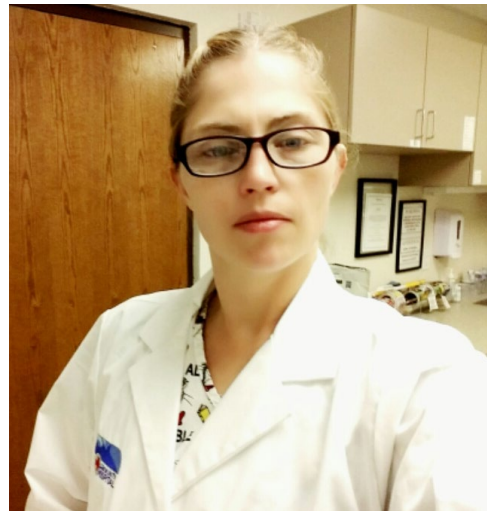
Our future plans include the addition of Self-Directed Testing. This would enable our students that meet certain criteria, such as being asymptomatic, to come directly to the lab, review an informational handout and then choose from a menu of tests for sexually-transmitted diseases. We hope to have this service available later this summer.





## Stories from the Front Lines: The Lab Test Indicated Something was Very Wrong.

**Name:** Crystal Mead, PST (ASCP)<sup>CM</sup>  
**Title:** Medical Lab Assistant, Morrill County Community Hospital  
**Location:** Bridgeport, Nebraska



I was 20 years old and very green in my position as General Manager at the Village Twin movie theater, when I was invited to attend a managers' meeting in Colorado. I didn't know what to expect from this event. My City Manager (who I would be traveling with) and my District Manager (who would be conducting the meeting) both intimidated me so I was pretty nervous; and, if I was totally honest I was pretty under trained and irresponsible in my position. We arrived in the early evening and had a delicious steak dinner with other managers from around the tri state area. We talked theater talk and laughed for hours before retiring to our individual hotel rooms for a good night's sleep before the full day of meetings that would begin bright and early.

When I woke the next morning I felt an uneasiness in my stomach. It seemed I was even more nervous than I had realized. As the meeting commenced, the butterflies in my stomach shifted to a dull, annoying nausea. I decided I just needed something to eat, and a few hours later the caterers arrived and I was served a marvelous Asian chicken salad. I ate every last bite.

That's when things got bad.

As the afternoon portion of the meeting proceeded the feeling in my stomach became more and more painful. I felt pressure like I would literally explode. To make matters worse, I felt dizzy and clammy. I didn't catch a single word that was said at the meeting the rest of the day. I had become completely absorbed in my own suffering.

Finally the meeting concluded, and on the drive home I admitted to my boss that I wasn't feeling the best. Then I began to vomit. It didn't stop all the way home and all through the night. I decided it must be food poisoning. I considered going to the hospital but since I had no insurance I decided instead to suffer through alone in my home.

I didn't sleep at all, but by morning the immense pain had faded to a dull ache that radiated into my right hip. It caused me to walk with a limp but otherwise I felt okay. I took the day to rest but returned to work the following day. I thought I was out of the woods. The dull ache persisted, but other than keeping me up at night, it really didn't interfere with my day to day life. My appetite on the other hand was completely gone. When I did try to eat I became so nauseous that I finally quit eating all together.

Two weeks passed. I dropped 25 pounds and continued walking with a limp. Finally one night I decided that I needed to seek medical attention. In my gut I knew something was really wrong. I decided that the next morning I would go to the walk-in urgent care clinic before work. I even packed an overnight bag and made a list of phone numbers of people to be contacted in the event that I was hospitalized.

Upon physical examination, the Doctor could not find anything wrong with me other than a high fever, so he ran a CBC. That was the game changer. My white Cell count was so high that he sent me to the ER to meet with a surgeon. A couple hours later I was in emergency surgery to remove the fragments of my appendix that had ruptured 2 weeks earlier in that managers meeting. That simple blood test had given the doctors a big red flag that told them what I already knew in the back of my mind, that something was very wrong. I should have been dead, but the Lord in his mercy knew it wasn't time to take me home. My story doesn't end there. After the initial surgery I spent a couple days in the hospital and then went home, but I was not getting better. I still wasn't eating, and my belly was so distended I looked pregnant. I also wasn't passing anything. Then one afternoon I woke from a nap with the most excruciating pain I had ever felt in my life in my belly. I couldn't even move. My Aunt Sandy, a nurse, whom I had been staying with whisked me back to the hospital, where I was promptly admitted, NG tube reinserted and morphine started. Nothing relieved the pain.

This began the most miserable two days of my life. I huddled in the only position that was even remotely comfortable, sitting doubled over, with a pillow pressed hard against my belly. The entire two days was morphine- induced blur of radiology test after radiology test. X-rays, CAT scans, MRIs all finding nothing wrong. The lab tests, however told a different story. CBCs and CMPs ran twice daily

showed I was declining rapidly. Each result was worse than the last. Even though imaging testing and physical examinations made me appear to be okay, the lab results told the truth. I was dying. Finally it was decided in the middle of that night that I would have my second emergency surgery, this time exploratory.

Surgery revealed that my colon was gangrenous and that my small bowel had managed to work itself into a knot causing severe diverticulitis that was on the verge of rupture. The next several weeks were long and painful but eventually I made a full recovery. I didn't appreciate it at the time but I know now that my lab tests were a key element in saving my life. When everything else came up looking normal, my lab tests continued to send the message that something was very wrong.

As a lab professional, I see this sort of thing often. Patients with unexplained symptoms whose lab tests help build the pieces of what is really going on. Or those patients who seem healthy but routine lab tests show there is a ticking time boom brewing inside them. Lab test are crucial to diagnosing patients and saving lives and I am grateful to be a part of this profession.



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