

**P.O.L.**

# **Insight**

**A Continuing  
Education**

**Publication for the  
Physician Office  
Laboratory**

## ***In This Issue:***

- ***Quality & the LIS***
- ***Venipuncture Errors***
- ***Bringing Testing In-House***

**2009-C**

**Issue 56**

## Accreditation Statements

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Editor and Writer:  
Cheryl Murray, MPA, MT(ASCP)SM

Authors:  
Tim Dumas,  
Dennis J. Ernst, MT(ASCP)  
Ginger Wooster, MBA, MT(ASCP)

## AAFP-PT Staff

### Barbara Mitchell

*Program Manager*  
e-mail [bmitchel@aafp.org](mailto:bmitchel@aafp.org)

### Lisa Henderson

*Manager, Operations*  
e-mail [lhenders@aafp.org](mailto:lhenders@aafp.org)

### Cheryl Murray

*Manager, Education & Technical Assistance*  
e-mail [cmurray@aafp.org](mailto:cmurray@aafp.org)

### Shaurna Andrews

*Program Coordinator*  
e-mail [sandrews@aafp.org](mailto:sandrews@aafp.org)

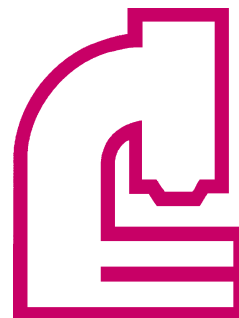
### Karen Bergman

*Program Coordinator*  
e-mail [kbergman@aafp.org](mailto:kbergman@aafp.org)

**AAFP-PT FAX**  
**913-906-6079**

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**2009-C CME Answers**

1.	B	13.	A	25.	B
2.	A	14.	D	26.	D
3.	A	15.	B	27.	B
4.	B	16.	D	28.	A
5.	C	17.	A	29.	C
6.	A	18.	D	30.	C
7.	D	19.	A		
8.	C	20.	D		
9.	B	21.	B		
10.	B	22.	C		
11.	A	23.	A		
12.	D	24.	B		

To earn the CME, answer the questions included with this issue of the *Insight*, using the form included, or submit the test online at [www.aafp.org/pt](http://www.aafp.org/pt) – click on Continuing Medical Education.

**CME Learning Objectives**

- Following completion of the self-instructional material, the participant will be able to:
1. Identify ways an LIS can help meet quality initiatives; describe how built-in decision support technology impacts quality at each phase of testing.
  2. Identify ten common pre-analytical errors in blood sample collection & handling; describe impact of venipuncture errors on test results; discuss techniques to avoid compromised samples due to collection errors.
  3. Describe the benefits of point-of-care testing in the POL; determine financial feasibility of in-house testing; discuss strategies for shopping for tests & analyzers.
  4. Use proper technique for performing microscopic urine examination.

**CME Changes!**

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Event 2009-B .....	May 31, 2010 .....	254-002-09
Event 2009-C .....	September 30, 2010 .....	254-003-09

## Quality Initiatives and the LIS

By Ginger Wooster, MBA, MT(ASCP)

Application Specialist, Orchard Software

### Why Quality?

Quality, quality, quality! Everywhere you turn, there's another article about quality, improving patient care, and Six Sigma accreditation. In today's environment of economic chaos, healthcare reform, reduced reimbursements, unpaid reimbursements, budget cuts, and staff shortages, if you are not paying attention to quality, you are going to be left behind.

If this isn't reason enough to focus on quality, look at the bottom line. Paying attention to quality processes is good for your finances. When resources are scarce, why waste them on repeating tests, redrawing patients, or looking for misplaced charts. Not only does this create waste, but it also makes for unhappy patients. Note: litigation is expensive. Don't accept that you and your staff are too busy. Do you wonder why no one has time to take the few moments up front to do something right, but always can find the hour or more to fix it once it becomes a crisis? Is this the best use of your expensive human resources? Don't skimp on quality. It will cost you in the end.

### What exactly do we mean by quality?

In this article, the term quality covers anything that is involved in getting the right result on the right patient to the right provider at the right time. In the lab, that pretty much means everything! Our regulatory environment dictates what you must do. How you do it will depend on the scope and workflow of your lab. There are many excellent resources describing how to set up a quality system: CLSI, COLA, CLIA, CLMA, AAFP, CAP, to name a few. Check them out if you need to formalize or tweak your quality program.

Once you have your quality program in place, the regulations also require that you monitor how you are doing. Again, what you measure and monitor will depend on your lab. Where are your problem areas? What tests do you always have to redo? What may potentially cause the most harm to your patients? Where are you spending time putting out fires on a regular basis? You don't need to measure everything, nor is it even possible. To paraphrase a sign on Albert Einstein's door: Not everything that counts can be counted, and not everything that can be counted counts. Also consider what you will do with the information you gather. Who will be accountable? Remember, insanity is defined as doing

the same thing over and over while expecting different results.

### Improving quality in the pre-analytical phase

Studies on laboratory errors indicate that the majority of errors happen during the pre-analytical phase. Something prevents the right tests from being done on the right patient. Your LIS should be interfaced to your practice management system so all the current patient demographics are available to the laboratory. Many patients use nicknames; patients are Jr. or Sr.; sometimes middle initials are used; and sometimes they go by the full middle name. This muddies up the demographics and increases the chance that tests will be ordered on the wrong person. Many lab systems have decision support technology to help manage patient demographic data and will alert you of possible patient matches. For example, if you are ordering lab tests on Betty Smith, the LIS will alert you that this may be patient Elizabeth Smith. Keeping the database clean helps prevent future errors, as well.

An LIS can also help you be sure you are ordering the right tests. It can prevent you from ordering a PSA on a female, and if you order a urine pregnancy test on a male, it can prompt you that you may want the bHCG. The LIS can also prevent duplicate testing. For example, if a CMP is ordered with the Hepatic Function Panel, the LIS can automatically correct the order to a CMP with direct bilirubin and change the billing information, so you are billing correctly for what was performed. Decision support technology can help improve quality in many areas: the physician gets the results he/she wants; the lab is not wasting resources performing duplicate tests; and the reimbursement/insurance claims are filed correctly.

Also related to reimbursements, Advance Beneficiary Notices (ABNs) must be obtained when necessary, or reimbursements will be lost. Most lab systems can alert you to the medical necessity issues, frequency violations, or research-only testing that might inhibit reimbursement. And in those cases, the LIS will print the ABN so the phlebotomist can discuss the situation with the patient. The ABN status is entered in the LIS, and the appropriate modifier will be sent to the billing department. This allows you to collect the right information up front, so you have everything needed to file a clean claim the first time. If medical necessity issues cannot be resolved at the time of draw, there is no need to delay the testing. The LIS can generate a report listing all those patients who need additional billing information, so the issues can be resolved before the claim is filed. These are some of the ways the LIS can help shorten your collection cycle.



Decision support will also allow you to configure the LIS to automatically route those tests that need a particular outside lab (eg, special testing or insurance). The LIS can prompt the phlebotomist with a message regarding the number and types of tubes to collect, as well as any special processing instructions. This ensures that important clinical information, such as the source of the swab for culture, is also captured at order entry. Getting the right specimen collected properly and sent to the right lab with the right information the first time minimizes repeat collections, and getting the specimen routed to the correct testing facility improves quality and improves your bottom line.

### **The LIS and quality in the analytical phase**

Now that we have the right specimen on the right patient, it is time to use the LIS to obtain the right result. When the order is saved in the LIS, a bar code label prints with all appropriate information. Throughout the testing process, the bar code ensures positive patient identification so the instrument runs the right tests on the right sample. Even before patient results are reported, the LIS Quality Control (QC) tools are helping. QC can be automatically ordered to ensure it is not forgotten. Westgard rules can be set up for each analyte, and any QC results that are out of range or violate a Westgard rule will be flagged to alert the lab staff that corrective action is needed. The LIS can also be configured to prevent the approval of patient results if the QC has not been reviewed and approved.

The QC tools in the LIS handle qualitative results as well. Internal QC information for manual kit testing is easily entered. As with quantitative QC, if the internal QC result is not entered, the patient results cannot be approved. This electronic documentation eliminates another paper log.

The LIS can help the lab staff identify inaccurate or absurd results. Labs are sometimes forced to operate with fewer staff, and many wear multiple hats and may lack formal laboratory education. All the knowledge of the highly trained medical technologist or consultant can be set up as decision support rules in the LIS so that protocols are viewed by everyone and execution is standardized. For example, if the hemoglobin and hematocrit do not match, the LIS alert the tech and show protocols of what to do. In another example, if the urine dip has positive blood or leukocytes, the tech will be alerted that a urine microscopic exam is needed. The LIS can automatically order the

microscopic exam and change the UA dip order to a complete UA thus everything is billed correctly.

It is a given that the LIS will flag abnormal and critical results, but a good lab system will also alert the lab staff as to the next step. Standardization on best practices is a sure way toward generating quality results. The LIS allows easy access to all historical results for the patient so the lab staff can see if the patient runs high or low for a particular analyte. Delta checks can also be established to flag any significant changes in a patient result.

To simplify regulatory documentation, comments can be standardized in a user defined pick list and text shortcuts can be created to reduce manual entry. One example is critical result notification. The LIS can be set to prevent approval of a critical result until the appropriate documentation (called to and result read back by) has been entered.

### **Delivering quality in the post analytic phase**

Now that the proper result is ready, the next step is to deliver the result to the right place at the right time. Decision support in the LIS also ensures those results arrive when and where they are needed. If an EMR is in place, the results will automatically be sent as soon as they are approved. Rules for routine results can be set to print or fax at a designated place and time, but for stat or critical results, rules can be set to send the result immediately upon approval. With some lab systems, courtesy copies can be automatically faxed to other physicians involved in the care of your patient. Results can also be reviewed and acknowledged via the Internet. The LIS can track all result deliveries to document receipt and help troubleshoot any issues.

### **LIS tools for monitoring quality**

Once the lab has standardized its quality processes, the next step is to measure your results. Quality tools provided in most lab systems give you the ability to set up reports to monitor the desired quality indicators. One caveat: the information must be in the LIS in order to be captured in a report query. It is important to standardize comments and any text entry, not only for consistency on the patient reports, but also to enable data mining. Determine what information you want to monitor, and then standardize how that information will be entered in the LIS. The old adage holds true: garbage in, garbage out. As an example, in the pre-analytic phase, perhaps you want to quantify substandard specimens. One way to document specimen integrity is to have pre-defined comments such as lipemic, hemolyzed, clotted, QNS, etc. As



the specimen issues are detected, the comment is entered in the LIS. Simply run a query to capture all comments that contain any of the above keywords to quantify.

For disease management, a report can be set up to calculate the average A1C or LDL results individually by physician or for the facility as a whole. Once the reports are formatted, they can be scheduled to run at a set time. Results can also be exported into another application such as Excel so trending graphs can be created and shared.

The LIS can also simplify the documentation of supervisory review. Levey-Jennings charts for all levels of the quality control material can be reviewed simultaneously to detect shifts, trends, bias, etc. Patient results can be monitored by scheduling a daily query of all critical (or abnormal) results. Instrument maintenance and ambient temperatures can be organized and monitored in the LIS using the QC tools as well, and monthly and quarterly maintenance tasks can be scheduled to automatically remind a busy staff when it is time to complete them.

There are multiple ways the LIS can help with quality, and no two facilities are going to use the LIS in the same way. The ideas presented here are examples to stimulate your own thoughts of how you might use your LIS to capture and monitor the necessary information for your quality initiatives. Your LIS can help minimize errors and improve quality outcomes to enhance overall patient care.

*Ginger Wooster has been an active member of CLMA since 1998, and has served on the National CLMA Program Committee. During the course of 34 years of laboratory experience, she has held a variety of positions in tertiary care medical centers, small and medium size community hospitals and physician group practices. She served as Director of Laboratory Operations for a multi-state, multi-specialty physician group for 10 years, with full responsibility for all areas of the lab. She is a member of the CLSI Working Group on Quality System Essentials and Path of Workflow and has authored several articles on laboratory information systems and quality. She is currently an application specialist with Orchard Software, an industry leader for laboratory information systems.*

## Venipuncture Errors: The Top Ten

By Dennis J. Ernst, MT(ASCP)  
Director, Center for Phlebotomy Education

When you draw blood, are you happy just to get the red stuff in the tube? Or do you apply the body of knowledge on how those who draw blood can change the red stuff before it's even tested, and work to minimize your impact? More than likely, you'd like to apply the body of knowledge. For that you'll need Donald S. Young's *Effects of Preanalytical Variables on Clinical Laboratory Tests*. It weighs over seven pounds, has almost 2,000 pages, and includes over 6,500 citations.

No single article can begin to summarize the wealth of information in Young's book on collection, handling, and storage (preanalytic) variables that alter test results. But if digesting his feast is not an option, ruminate on this short list of the top ten preanalytical threats to accurate test results. It might enhance your understanding without all the dyspepsia.

**1 Improper mixing** — Contrary to what many might think, tubes don't mix as they fill. They

need to be inverted... *slowly*. Upend each tube as it fills so the air bubble rises to the top, then upend it again. Most manufacturers recommend 5-10 of these cycles for each tube so the additive completely infuses into the sample. When given a cursory side-to-side shake as if it were a baby's rattle, clots may form in a sample that is supposed to be fluid. If tested, the results may not come close to what's really going on inside the patient, and delicate laboratory instrumentation could become disabled.

**2 Insufficient volume** — Do you frequently underfill tubes and submit them for testing? If so, you could be party to test results that shortchange the patient in the management of his/her care. Every tube is manufactured with a precise amount of additive to prepare the blood for testing when it's completely filled. Underfill the tube and you tinker with that chemistry. Make sure you submit properly filled tubes only, and have a wide supply of lesser-volume tubes available at the draw station or in your tray for unexpectedly difficult draws.

**3 IV contamination** — According to the Clinical and Laboratory Standards Institute (CLSI), avoid all draws from the same arm as an

active IV unless absolutely necessary. When not avoidable, draw below the IV site after the IV has been shut off for at least two minutes. Document the sample was obtained from an arm with an IV. Drawing above an IV, even if it has been shut off temporarily, is ill-advised. The sample could be contaminated by analytes that remain in high concentrations above where they were being infused. Regardless, whenever samples are drawn from an arm with infusing fluids, CLSI's venipuncture standards states the tubes must be labeled as such.

Draws directly from central lines and other vascular access devices (VAD) threaten accurate test results to an even greater degree. When using such devices, which are not even designed for blood sampling, it risks:

- contamination with IV fluid;
- blood culture contamination;
- hemolysis;
- air embolism;
- introducing bacteria into port.

Drawing from a VAD might save the patient the discomfort of a venipuncture, but it could be at the expense of results that provide the physician with an accurate assessment of his/her health and medication status.

**4 Delays in processing**—The moment blood leaves the body, significant and irreversible changes take place. Your job is to win the race against those changes so that the blood you collected still represents the patient's condition when it's tested. For samples to be tested for potassium, centrifugation and separation of the serum or plasma from the cells must take place within two hours.

For most tests, store and transport samples upright at room temperature, not refrigerated. Refrigeration is for vegetables, not blood to be tested for clinical diagnosis and management. EDTA tubes should be able to provide accurate cell counts if kept at room temperature for 12-24 hours (automated differential counts are much less stable); citrate tubes for protimes can provide accurate results if kept at room temperature with stoppers intact for up to 48 hours. Cooling citrate tubes adversely affects results. Activated partial thromboplastin times

(aPTT) are only stable for four hours. Delays beyond this should prompt centrifugation, separation, and freezing of the plasma.

**5 Incorrect order of draw** — the order in which tubes must be filled is well established, but not well known. It must be followed in order to prevent the additives that carry over from one tube to the other (by the needle that pierces their stoppers) from affecting test results. The effect of additive contamination is real and significant. The current CLSI recommended order, which is the same for syringe- and tube-holder-draws, has not changed since 2003 and is as follows:



**First:** blood culture tubes or vials

**Second:** sodium citrate tubes

**Third:** serum tubes with or w/o gel or clot activator

**Fourth:** heparin tubes

**Fifth:** EDTA tubes

**Sixth:** oxalate/fluoride tubes

**6 Specimen/patient misidentification** — Nothing threatens accurate test results like a misidentified patient or sample. It's the most potentially fatal preanalytical error healthcare professionals can make. Statistics show 160,000 adverse patient events occur each year in the US because of patient or specimen identification errors involving the laboratory, and that eleven percent of all transfusion deaths occur as a result of the phlebotomist not properly identifying the patient or mislabeling the tube of blood. Therefore, every patient must be considered a stranger, and be subjected to the same identification protocol. According to CLSI, proper patient identification must include the following steps:

- Have patients state their full name, not affirm the name you provide;
- Have the patient spell his/her last name;
- Have the patient provide his/her address, a unique identification number, and/or birth date;



- compare the information given with the identification bracelet, if available (inpatients), which must be attached to their person.
- If the patient cannot provide this information because of a language barrier or other condition, a family member or caregiver should be asked to provide it.

All biological samples must be completely and permanently labeled at the patient's side. Before leaving the patient, he/she should be asked to observe the samples and confirm they are identified properly. Alternatively, the labeled samples should be compared with the patient's identification band. Healthcare professionals should never label samples they haven't drawn themselves.

**7 Hemoconcentration** — When blood concentrates below a constricted tourniquet, it changes in nature within one minute.

Therefore, if vein selection, site cleansing, and access take longer than one minute, release the tourniquet for two minutes to allow the blood to return to its basal state. Then reapply the constriction and access the vein in one minute or less.

**8 Falsely elevated potassiums** — Of all lab tests, potassium is the one analyte that is affected by more preanalytical variables than any other. In fact, Young's book lists over 50 variables that change the potassium level before it is even tested. It's beyond the scope of this article to cover them all, but here's a list of those errors affecting potassium that are most commonly committed. All cause falsely elevated levels:

- **Fist pumping:** responsible for half of all panic-level potassiums and one-third of all elevated potassiums. Fist pumping also raises the reported potassium up to 20%.
- **Delays in processing:** after two hours, the potassium in an uncentrifuged collection tube increases dramatically;
- **Refrigeration prior to separation:** potassium rushes out of red cells and spikes the level in the serum or plasma;
- **Recentrifugation:** spinning tubes a second time increases potassium in the serum or plasma 47%;

- **Inadequate centrifugation:** using fixed-angle centrifuges and those that produce a g-force lower than that recommended by the tube manufacturer leave potassium-producing platelets and potassium-rich red cells in the serum or plasma. They also lead to poor gel separation.
- **Combining tubes:** pouring the contents of a lavender-top tube into a tube to be tested for potassium should never be performed since the EDTA of a lavender-top tube is rich in potassium;
- **Spinning with stoppers off:** this tactic increases potassiums by 135%.

**9 Hemolysis** — Many factors cause red blood cells to rupture, forcing their hemoglobin into the serum or plasma and threatening the accuracy of nearly all laboratory tests; most of them occur during or immediately following the draw, and are preventable. The causes of hemolysis include:

1. Improper needle placement;
2. Excessive pulling pressure on the plunger of the syringe;
3. Using a needle smaller than a 23-gauge;
4. "Milking" the site of a capillary puncture;
5. Premature or excessive centrifugation;
6. Prolonged tourniquet application.

**10 Underestimating the procedure** — Phlebotomy is not as easy as some make it look. Those who underestimate the skill and preanalytical knowledge that must be mastered in order to prevent the process from affecting the outcome are capable of invoking all nine of the threats above on the samples they collect.

You may not have time to digest Young's seven-pound preanalytical feast, but keep these top ten threats to accurate results in mind every time you draw or handle the red stuff. Since you are a critical ingredient in your employer's recipe for quality healthcare, applying this body of knowledge every time helps the laboratory serve up a banquet of accurate results.

*Dennis J. Ernst MT(ASCP) is the Director of the Center for Phlebotomy Education, Inc. in Corydon, Indiana.  
www.phlebotomy.com*

## Point of Care: Bringing Testing In-House

By Tim Dumas, CLS, CRSP, NSA accredited speaker  
President, Tim "The Lab Guy" Consulting

In my many years as a Physician Office Laboratory (POL) consultant, I have been called upon to evaluate the feasibility of in-house laboratory testing. The physician and/or lab manager - understanding the value of a POL - is/are investigating the possibility of improving patient care and potentially increasing practice revenue.

### Unfortunately this has been the exception!

Most times I am called in *after* the critical decisions have been made and the laboratory is either facing a CLIA deficiency or not proving profitable. Although each situation is unique, I find two common issues when POL's are facing these dilemmas:



state- of-the-art lab technology and field questions about in house Lab testing.

**How much?**... was the first and most frequently asked question. As a lab consultant and speaker, I respond with the more important questions like, what will it do for your patient care and your ability to diagnose and treat? . . . and how much revenue will it generate? How about the ROI?

The medical **Physicians' Office Lab** is an investment. And like all investments you need to analyze the benefits and returns *before* you go shopping.

With today's technology and advancements in waived testing, it is more practical and profitable than it has ever been to perform lab tests in house. Laboratory analyzers of today run leaner and more economical than ever before, lab computers have made the processing of test specimens more

efficient and less prone to human error, and the EMR practice systems have streamlined the billing process to capture more of the revenue.

Having a POL can prove rewarding and profitable, *if* you take time to plan. There are three basic steps for determining what is right for your practice and reaping the many benefits of a POL:

- Decide which tests are medically right for your patients and your practice;
- Calculate the financial impact and Return on Investment (ROI); and
- Choose the procedures and vendors.

According to consumer analysis, the small practice segment of the POL market is the largest and fastest growing segment in the United States. By definition Point of Care Testing (POCT) would be any test performed at the "point of care" or where the patient care is administered. This allows patient results to be reported more quickly and gives the medical practitioner the ability to determine treatment while the patient is still present or at least within the same day. With state-of-the-art equipment and data management capabilities, in-house laboratory testing even has the potential to generate additional practice revenue.

To **determine your specific in-house testing potential**, compile a list of the most common tests that you reference out, by either 1) collecting the specimen and sending it off, or 2) referring the patient to another facility. Your current reference laboratory can provide you with a list of tests and the frequency ordered from the previous year. An easier, but less accurate, method is to sit with the medical staff and ask how many tests they order per day.

Once you have compiled this list, the next phase is most critical for determining feasibility: **Calculating the financial impact and Return on Investment (ROI)**.

Use this simple formula in your Excel program. It will help you decide which tests are right for your practice by estimating your projected revenue. The same formula will monitor your future revenue:

A = # of tests performed per month  
B = reimbursement per test  
C = cost per test

**[A x B] - [A x C] = Potential revenue**



# of tests performed/month	Reimbursement per month	Cost of Test per Month	Reimbursement minus Cost	ROI per year
CPT CODE 83036 A1c	A x B	A x C	(A x B) - (A x C)	\$226.50 x 12
25	25 x \$13.56 = \$339.00	25 x \$4.50 = \$112.50	\$339 - \$112.50 = (profit/month) \$226.50	\$2,718.00

**Table 1**

Table 1 is an example of the calculations using a waived A1c test procedure.

While this is not the final answer, it provides a quick assessment for the feasibility of performing the test in house.

If you are already doing in-house testing and have not figured out the revenue generation, this formula can be used to monitor and maximize your lab profits.

On the subject of Non-waived testing (e.g., CBC, Chemistries), it is important to remember you must submit a request to CMS with your intention of performing Moderate complexity tests ( non-waived). Provide them with the name of the test, analyzer and the number of test per year you will perform. You will be required to adhere to more QC and QA regulations, including Proficiency testing, a requirement that ensures your lab results are accurate and the lab personnel are proficient. I think you will find the pay off is worth it. They will schedule an inspection of your lab within 6 months.

Table 2 is an example of Non-waived testing performed in-house. If you decide to perform CBC's the numbers might look like these.

\$22,274.00. I don't know any office that couldn't use an extra \$22K!

Another significant benefit of this evaluation would be the ability to audit your billing process. Count the number of tests being performed in the lab and compare it to the number of tests actually being billed. Offices often find they are not accounting for all the tests being performed. Most Lab Information Systems today will provide a daily test count. Be sure to also monitor the reimbursement of those tests.

Once you have decided which tests would be beneficial, it's time to buy. **Choosing the right vendors and procedures are key to a successful and profitable lab.** The first place to check is with your medical-supply vendor. Ask your favorite medical sales rep what they have to offer in that line of testing.

**Shop and Compare!**

Educate yourself from several different resources (e.g. internet, colleagues, trade journals, consultants and so forth) and then get quotes and information from three to four different vendors.

**Table 2**

# of CBCs performed/month	Reimbursement per month	Cost of Test per Month	Reimbursement minus Cost	ROI per year
220	\$2497.00	\$220	\$2277.00	\$27,324.00*

\*\$27,324 is Gross revenue per year. You will need to subtract the yearly expense costs of the hematology analyzer (estimate-\$3,000), service contract (\$1,700), and proficiency testing (\$350) from that number. Which still give net revenue of



There are many small medical-supply companies that specialize in lab testing. Look for companies that offer more than one brand of analyzer for each test category. Many test kits are brand name and are distributed by many vendors as well. Let the product sales professionals educate you on the "pros and cons" of testing methods, and then use a team approach to choose the best ones for your situation.

A few sample questions you may want answers to are:

- What level of complexity is each method?
- How much space will the analyzer utilize?
- How much will the analyzer cost and what type of financing is available?
- What will the yearly service agreement fee be?
- What is the "cost per reportable result"?

Ask to do a site visit where the analyzer is operational so you can see it in action and talk to the people that actually run it.

#### Key features for analyzer technology

Through new technology, the lean processing of large labs is now available for the smaller office labs. Here are some key features to look for in a lab analyzer:

- Fewer disposables will decrease the cost per reportable and help your lab go green.
- The ability to read bar codes streamlines the process and reduces human clerical error.
- Lower cost for the analyzer itself.
- Reasonable fees for service contracts. (I have been in a lab where the service contract fee was more than the revenue generated from the analyzer.)
- Direct tube sampling.

#### Laboratory Information Systems (LIS)

Don't attempt the POL without an LIS. It will serve as your best friend (and an additional FTE) when it comes to QA, QC, lab management, data transfer and a host of other things.

Do not sell your self short. A difference of \$.50 per test is big over time. If you perform 25 tests per month that equals 300 tests per year. At 50 cents each, that is \$150. What could you have spent that on? How about a little holiday bonus for the lab personnel?

There are four main areas that generate revenue for the medical practice: practitioner, laboratory, radiology and pharmacy. If you use any of these services, it is really important to maximize the benefits from them. Manufacturers are continuously researching and developing POCT products. POL's can be a welcome service to your patients and a great source of revenue with little investment and usually no added staff.

#### Someone is going to be running the test and getting paid for it. Why not you?!

*Tim Dumas, aka "The Lab Guy", brings over 25 years of experience in the laboratory, business and entertainment world to help clients find unique ways to improve creativity, increase sales and profits, and use humor to develop fun and productive work environments.*  
[www.timdumas.com](http://www.timdumas.com).



### Tech Tip:

## Urine Microscopic Exam

- Centrifuge urine for at least 5 minutes
- Use a cover slip
- Use 10x ocular and reduced background lighting to view casts
- Use 40x ocular and brighter light to identify cells, bacteria, crystals, casts and artifacts
- Never use oil immersion

 **2009-C CME Questions**

The material necessary to review to answer the following questions may be found in this issue of the *P.O.L. Insight* and the *AAFP-PT Handbook* or on the AAFP-PT website (<http://www.aafp.org/pt> and click on Continuing Medical Education). The Test Sheet may be found on page 16 of this *P.O.L. Insight*. The Accreditation information may be found on the inside cover of this issue.

1. True or False: Quality has no impact on practice finances.
  - A. True
  - B. False
2. The majority of errors occur during the \_\_\_\_\_ phase of laboratory testing:
  - A. Pre-analytical
  - B. Analytical
  - C. Post-analytical
  - D. Both "B" & "C"
3. True or False: An LIS can prevent inappropriate test orders and avoid duplicate testing.
  - A. True
  - B. False
4. True or False: An LIS will not remind you to do QC.
  - A. True
  - B. False
5. LIS-generated bar codes:
  - A. Provide positive specimen identification
  - B. Ensure proper tests are performed
  - C. Both "A" & "B"
  - D. Neither "A" or "B"
6. True or False: An LIS can automatically indicate the need for additional follow-up testing and adjust billing accordingly.
  - A. True
  - B. False
7. An LIS can provide results:
  - A. At a specific time for routine results
  - B. Immediately for STAT or critical value results
  - C. To multiple providers
  - D. All the above
8. Standardized comments:
  - A. Provide consistency
  - B. Allow data mining
  - C. Both "A" & "B"
  - D. Neither "A" or "B"
9. True or False: An LIS has little impact on assuring quality.
  - A. True
  - B. False



10. Protimes in citrate tubes are stable for \_\_\_\_ hours at room temperature:
  - A. 12
  - B. 48
  - C. 72
  - D. 24
11. True or False: Recommend storage for most blood samples is upright at room temperature.
  - A. True
  - B. False
12. Recommended order of draw is:
  - A. green, red, blue
  - B. gray, lavender, red
  - C. red, blood culture, blue
  - D. blue, red, lavender
13. Tourniquets should remain in place for no longer than \_\_\_\_ minutes before venipuncture.
  - A. 1
  - B. 2
  - C. 3
  - D. 5
14. The lab test most affected by venipuncture errors is:
  - A. Glucose
  - B. Sodium
  - C. Cholesterol
  - D. Potassium
15. True or False: 20% of transfusion deaths are the result of mislabeled specimens.
  - A. True
  - B. False
16. Hemolysis can result from:
  - A. Improper needle placement
  - B. Prolonged tourniquet application
  - C. Use of a needle smaller than 23-gauge
  - D. All of the Above
17. True or False: You should never ID a specimen you didn't draw yourself.
  - A. True
  - B. False
18. Benefits of Point-of-Care testing include:
  - A. Results available while patient is still present
  - B. Less risk of lost or compromised samples
  - C. Potential for enhanced revenue
  - D. All of the above



19. True or False: Point-of-Care testing (POCT) is defined as any test performed where patient care is administered.
  - A. True
  - B. False
20. Adding a non-waived test(s) to the test menu requires::
  - A. Notification to CMS
  - B. Meeting additional QC requirement
  - C. Enrolling in proficiency testing
  - D. All of the above
21. True or False: The first step in setting up an in-office laboratory is to shop for equipment.
  - A. True
  - B. False
22. Choosing the right analyzer can:
  - A. Help your lab "go green"
  - B. Reduce human error
  - C. Both "A" & "B"
  - D. Neither "A" or "B"
23. True or False: Gross revenue equals reimbursement minus cost of test.
  - A. True
  - B. False
24. True or False: Gross revenue projections include equipment purchases, service contracts, and proficiency testing expenses.
  - A. True
  - B. False
25. True or False: Additional revenue of less than \$1 per test is not worth it.
  - A. True
  - B. False
26. Urine microscopic exams are performed with the \_\_\_\_\_ objective.
  - A. Oil Immersion
  - B. 10x
  - C. 40x
  - D. Both "B" & "C"
27. True or False: Urine sediments are examined with a cover slip and oil immersion lens.
  - A. True
  - B. False
28. Urine casts are best visualized with:
  - A. Reduced lighting
  - B. Full bright illumination
  - C. 100x magnification
  - D. None of the above



- 29. Participating in this CME activity is worth \_\_\_\_\_ unit(s).
  - A. 1
  - B. 2
  - C. 4
  - D. 8
  
- 30. Documentation of CME participation is available on-line by printing a:
  - A. Course roster
  - B. Activity Record
  - C. Letter of Participation
  - D. Class syllabus



# AAFP-PT CME Test Answer Sheet

**ALL INFORMATION MUST BE COMPLETED TO OBTAIN CREDIT**

**2009-C** (submit by September 30, 2010 to obtain credit)

**Please print:**

**Individual AAFP #:** \_\_\_\_\_

*(All participants in the AAFP-PT are now assigned a 7-digit AAFP number; AAFP-member physicians should use their AAFP-ID number; non-member physicians and laboratory personnel are assigned an ID number the first time CME is submitted)*

**Lab AAFP #:** \_\_\_\_\_

*(All labs enrolled in AAFP-PT are assigned a 7-digit AAFP number. The Lab ID number may be found on the Order Confirmation and on evaluations.)*

\_\_\_\_\_  
Name (Last) (First) (Initial)

\_\_\_\_\_  
Street

\_\_\_\_\_  
City / State/ Zip Code

\_\_\_\_\_  
Fax Number

\_\_\_\_\_  
Email Address

Address or Fax change     Name change     Email change

<b>Select one if you are a physician:</b>		
<input type="checkbox"/> FP	<input type="checkbox"/> IM	
<input type="checkbox"/> PED	<input type="checkbox"/> OB/GYN	
<input type="checkbox"/> Other		
<b>Select one if you are laboratory personnel:</b>		
<input type="checkbox"/> MT	<input type="checkbox"/> MLT	<input type="checkbox"/> Nurse Practitioner
<input type="checkbox"/> RN	<input type="checkbox"/> LPN	<input type="checkbox"/> Physician Assistant
<input type="checkbox"/> Med. Assist.	<input type="checkbox"/> Laboratory Manager	
<input type="checkbox"/> Laboratory Consultant	<input type="checkbox"/> Other	

**Evaluation:** please fill in bubble between 1 & 5 – 1 denotes poor, 5 denotes excellent:

1. To what extent were the objectives achieved?  
*poor*    ①    ②    ③    ④    ⑤    *excellent*
2. To what extent did the AAFP-PT education program *content* relate to the program's objectives?  
*poor*    ①    ②    ③    ④    ⑤    *excellent*
3. Rate your overall degree of satisfaction with this education program.  
*poor*    ①    ②    ③    ④    ⑤    *excellent*
4. In what general area of laboratory practice would you like to receive educational materials? (please mark all that apply).
  - CLIA and/or regulatory. requirements
  - Good laboratory practices
  - Test Procedures
  - Technical Subjects
  - Business/Financial Aspects
  - Other, please specify \_\_\_\_\_

**Fill in the circles for the correct answers:**

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
1.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Return to: AAFP-PT Education Program  
11400 Tomahawk Creek Parkway  
Leawood, KS 66211-2672  
or Fax to 913-906-6079

**Important: Keep a copy of the completed form for your records. Documentation of CME hours earned is available at [www.aafp.org](http://www.aafp.org).**