education and training

How the West Virginia University CLS Program Was SAVED

Cleveland Clinic: Building a Workforce and Rebuilding a City

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State budget cuts threaten university education programs for laboratory professionals. Demand for laboratory professionals outstrips supply.

Training in morphological diagnosis dominates pathology residency programs. New pathologists find themselves lacking much-needed skills in molecular diagnosis and laboratory management.

Pathology and laboratory medicine must bring creative solutions to these challenges. This issue of Critical Values presents several ways to revitalize education of laboratory professionals: one developed and implemented successfully by a university and another by a hospital system. An excerpt from a recent report by the National Accrediting Agency for Clinical Laboratory Sciences describes additional innovative approaches. ASCP is working to facilitate solutions by working with our partners in universities, helping them communicate the value of their programs to university administrators and sharing successful strategies employed elsewhere. When necessary, ASCP does not hesitate to employ public lobbying efforts to advocate on behalf of these programs.

Also in this issue, the co-chairs of the ASCP Resident Council weigh in on published criticisms of the preparedness of new pathologists and urge residents to take matters into their own hands. “We must make it our goal to be the most knowledgeable and skilled pathologists possible,” they write. “To do this, we must keep an ongoing inventory of our knowledge base and skill sets in order to identify deficiencies. Then we must seek out the education and training needed to amend them.”

The ASCP Resident In-Service Examination (RISE) is a key tool for residents to assess knowledge gaps and prepare for future practice. ASCP also provides an incredibly comprehensive array of long-term professional development and assessment opportunities for residents, pathologists, and laboratory professionals. The breadth of these opportunities is on display on pages 32-34. ASCP is working in consultation with residency program directors to address training gaps in laboratory management and professional development. And the Society provides numerous education courses in molecular testing for pathologists at all stages of their careers.

Another aspect of education that must remain front and center is the maintenance of certification (MOC) for pathologists and the certification maintenance program (CMP) for laboratory professionals. The chair of the Council of Laboratory Professionals describes “re.member,” a new ASCP membership plan designed to make earning and tracking recertification credits easier than ever.

The ASCP News section calls attention to the Society’s newest media spokespersons and advocacy on behalf of clinical laboratory science programs threatened with closure. In Arts in Culture, meet pathologist Robert O. Greer, ScD, DDS, author of 12 novels, most of which feature “streetwise African-American bounty hunter and bail bondsman CJ Floyd.”

I welcome your feedback on this issue of Critical Values, as well as your suggestions for other important topics you would like to see covered here. Contact me at president@ascp.org.

Dr. Stoler is president of ASCP.
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Putting Words into Action: focus on education

By Mark H. Stoler, MD, FASCP
The ASCP is in a critical transition—one that I believe will ultimately improve overall patient care and gain laboratory professionals greater recognition and respect as contributing members of the health care team. In my January column, I talked about patient-centered advocacy and why the Society decided to adopt this new strategic direction. In this column, I focus on how patient-centered advocacy will impact all ASCP educational activities.

A New Continuing Education Formula

To fully implement the concept of patient-centered advocacy, ASCP members must transform their image as mere data producers to that of active, integral participants in patient care. Now more than ever, we must become the “go-to folks” for information and advice on all aspects of laboratory testing, including how test results influence not only diagnoses but also therapy and management. Achieving this could have a real impact on the cost and quality of patient care as well. Patients who are given the right test at the right time are more likely to receive the right treatment sooner and thus recover more quickly. Conversely, less money will be spent on unnecessary tests or ineffective treatments.

How do we help prepare laboratory professionals to fulfill this expanded role? The answer, of course, is education, but what kind of education and how do we optimally deliver it? Certainly, formal training programs must start preparing new laboratory professionals for this type of practice. However, most laboratory professionals are already in the workforce, and those in training will soon join them. Because ASCP is the largest provider of continuing education in laboratory medicine, this places the responsibility squarely on the Society and its education programs.
Realizing this, ASCP reevaluated its professional development programs, resulting in a new continuing education (CE) formula. Henceforward, all CE programs and products must meet at least one of three criteria. They must

- Enable learners to stay current with the requirements of their existing jobs—not only the best science but also the best practices in such areas as quality assurance and patient safety.
- Teach new technologies that will keep laboratory professionals scientifically current.
- Impart the nontechnical skills needed to assume new roles in health care, including the management, human relations, and communication skills required to communicate effectively with clinicians.

Furthermore, all programs should reflect the best science and best practices based on evidence and should directly support Maintenance of Certification (MOC) and the ASCP Board of Certification (BOC) Maintenance of Certification Program (CMP).

The growing tide of new technologies presents an opportunity for laboratory professionals to become consultants to clinicians who don’t fully understand these new tests. But we must also be willing to step outside the laboratory and connect with other health care professionals on their home turf. ASCP’s challenge is to provide members with the correct skill sets needed to fulfill this role. In addition, members must be open to learning new skills and incorporating them into their medical practice.

**Beginning Steps**

ASCP has already made progress implementing this vision. First, we reorganized the Society’s governance structure, merging the previously freestanding commissions on Assessment, Education, and Publications into one, the Commission on Continuing Professional Development chaired by Steven H. Kroft, MD, FASCP. This merger allows the use of all ASCP’s resources in concert to inform the development of educational offerings—to ensure they meet the criteria listed above and to determine the best way to present information to learners.

Most educational offerings will be presented in more than one format to accommodate different learning styles. Live lectures, for example, will be captured as streaming video and audio that can be heard or viewed on a computer, iPod, or cell phone wherever and whenever desired.

Over the last two years, the Web site has also been redesigned, and this will be an ongoing and evolving process. A new service called ASCP Education Home is a personalized center for managing all aspects of continuing professional development. I encourage you to start using this major member benefit immediately. From Education Home (www.ascp.org/education), pathologists can learn what MOC is and how to fulfill their MOC requirements. Likewise, a link for laboratory professional members tells them everything they need to know about CMP.

The redesigned Web site also links directly to information on the Society’s various educational options: live educational courses and workshops, self-directed at-home studies on specific topics, skills assessment programs, and numerous online learning options such as teleconferences, on-demand Webcasts, practice exercises, and case studies.

Finally, re.member is a new kind of ASCP membership program that includes online education and special tools to help all laboratory professionals manage their CMP recertification requirements. It proactively and interactively helps individuals find and take applicable online courses, as well as track and record their CE credits through the ASCP Web site. Most credits received through ASCP are recorded automatically, but the tracking system is flexible—members can manually enter CE credits awarded by other organizations. A similar comprehensive program is already planned for pathologists and should be implemented in the not-too-distant future.

Our goal in refocusing and improving ASCP educational programs is to make the knowledge base of our members more relevant—more central to clinical practice. At the same time, through MOC and CMP we are certifying that our members are not only competent but also on the cutting edge of laboratory medicine and thus are the best source for collecting the data and information that drive the majority of clinical medical decisions.

I welcome your comments or questions. Please e-mail them to President@ascp.org.

**Reference**


Dr. Stoler is Professor of Pathology, Cytology and Gynecology, and Associate Director of Surgical Pathology and Cytopathology at the University of Virginia Health System in Charlottesville, VA.
Leadership Messages
Message from the Chair of the Council of Laboratory Professionals

Managing the Process of Recertification

By Junell M. Petersen, MS, MLS(ASCP)CM,SHCM

Education is important, right? You are probably thinking, “Duh, of course.” But the reality is that many of us are so busy performing our daily routines that we have little time to seek the educational opportunities we want and need. When we do find them, they may be too costly or offered at an inconvenient time or place. As laboratory professionals ourselves, ASCP leaders understand these problems and endeavor to make ASCP continuing education affordable and easily accessible.

Certification Maintenance

Because of the current onslaught of new medical discoveries and the rapid development of new laboratory technologies, continuing education (CE) is more important than ever. Thus, in 2004, the ASCP Board of Certification (BOC) implemented the Certification Maintenance Program (CMP), which requires laboratory professionals to fulfill certain CE requirements in order to maintain their ASCP certification. Those certified before 2004 are exempt from CMP, but they may choose to participate voluntarily.
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Put science on your side.
I was certified longer ago than I care to admit, so my Medical Technologist and Specialist in Hematology certifications will never be taken from me. However, I choose to participate in CMP because I believe CE is necessary to stay abreast of my profession. Consequently, I now fulfill my CE requirements every year, not only to keep my knowledge and skills up-to-date but also to have clear documentation of that fact. Fortunately, ASCP has made it easier than ever to do this. I can get my CE credits from a variety of sources and keep track of all of them on the ASCP Web site.

ASCP itself tries to meet the CE needs of laboratory professionals by presenting information in a variety of forms, from journal articles, to teleconferences, to live events. Each format has its own merits and usefulness. Journals can be read at any time or place, while teleconferences can be attended as live events (where I usually learn as much from the question-and-answer portion as I do from the lecture). Live events also provide opportunities to network with peers and share information and ideas. Most people discover that many of their colleagues face the same problems and can frequently offer suggestions or solutions.

Live events such as Workshops for Laboratory Professionals feature renowned speakers who can give attendees excellent in-depth information on a subject. Teleconferences are another alternative and, because they seldom require travel, are more appealing to some people.

Another method of CE delivery is the use of well-written articles and papers on particular subjects. By incorporating learning objectives and adding a post-test, these become a source of CE credits. Participants must review the material and successfully complete the post-test. Test questions, which are generally very well crafted, allow us to verify comprehension of the material. This education model appeals to people who like to do things on their own. Examples include LabQ, LabQ-P, CheckSample, Online Case Studies, and AJCP articles.

'Re.member' Makes It Easy

To make the whole process of earning and tracking CE credits even easier and more cost-effective, ASCP recently introduced the re.member membership plan. It is ideal for new graduates and people like me who need CE credits for recertification. By signing up for re.member, I can track my CE activities online and determine the CE credits I need to complete my CMP. I am alerted when I accumulate enough credits to recertify. The information is then sent to the BOC and my CMP is easily completed.

The plan also benefits employers. Some of the facilities I consult with have offered to reimburse employees some or all of the cost of the re.member membership. Because the re.member plan includes ASCP membership and the CE needed for certification maintenance, this is a win-win situation for both sides. Employers are spending money primarily for education without the travel costs, and employees have access to a wide array of CE materials and automatic tracking of their CMP credits.

As professionals, we must strive to be lifelong learners in order to stay current in our field. The easiest way to accomplish this goal is to maintain membership in a professional organization and to participate in CE activities. ASCP offers both with the re.member membership plan—a true "solution" to the recertification process.

If you have any comments or questions about this column, please e-mail me at MemberChair@ascp.org.

Ms. Petersen is the Outreach Coordinator for Laboratory Services at Rice Memorial Hospital, Willmar, MN.
In recent years, a few pathology journals have published papers containing disparaging claims about pathology graduates. It is the contention of some pathologists that “young” pathologists lack a number of skills critical to the practice of pathology.\(^1\)\(^-\)\(^3\) The legitimacy of this assertion is certainly debatable, and we encourage all “young” pathologists to review these papers in order to be aware of the issue. We believe these unproven allegations are deleterious to the reputation of new graduates and to our profession. An editorial response\(^4\) to one report is illustrative:

“What appears to me is that pathology programs are not being very effective if they produce some 31% of graduates with at least one major deficiency and if some 61% of personnel need guidance. Groups should also be advised that hiring on the cheap is not recommended in the long run. The overall cost of guidance of these types of graduates… far outweighs the savings versus the cost of an experienced pathologist. You may live to regret hiring such a graduate.”

The Perceived Problem

This situation is not new. In his entertaining 1961 classic, *My Friends the Doctors*, Sigmund L. Wilens, MD, a seasoned pathologist in New York, laments “pauper residents” who “spend four years learning their craft and only two of them are spent on autopsies” and grumps about “pathologists who are constantly plagued by requests for help from these presumably proficient youngsters.”\(^5\) However, Dr. Wilens admits in his treatise that his is an opinion. It is not passed off as science and published in a professional journal.

To summarize the issue, the College of American Pathologists and the Association of Pathology Chairs assert that some pathology residents are deficient in

“the ability to make relevant clinical decisions, lifelong learning habits, interpersonal and communication skills, professionalism, ability to recognize limitations, readiness to practice independently, gross pathology skills, ability to handle high-volume surgical pathology, ability to provide competent CP consultation, and preparation in laboratory medical direction and management.”

We take issue with these statements for a number of reasons, primarily because they are not based on science or measurement but on survey results obtained from a small number of respondents. For argument’s sake, could it be possible that graduate pathology training is producing a substandard product? Is there a systemic problem with pathology training that produces deficient graduates? If so, wouldn’t the entities that stake a leadership claim rapidly amend the situation? Apparently not. Sweeping changes in pathology education are not coming anytime soon. Consider the results of a 2008 survey of program directors.\(^6\) Nearly 20% of respondents reported that their programs were not utilizing the Academy of Clinical Laboratory Physicians and Scientists’ Clinical Pathology curriculum proposed two years earlier and only 5% to 13% said that U.S. pathology training programs are excellent at training residents in the areas of coagulation, microbiology, immunology, molecular pathology, chemistry, laboratory management, and laboratory informatics.

The Solution: Take Charge of Your Training

We residents and fellows are left in a conundrum. There are published papers stating that we are unprepared for practice, and we find no timely measures are being taken to correct alleged deficiencies in our training. The only current solution is that we residents must take responsibility for our own professional development, and we must make it our goal to be the most knowledgeable and skilled pathologists possible. To do this, we must keep an ongoing inventory of our knowledge base and skill sets in order to identify deficiencies. Then we must seek out the education and training needed to amend them. The following are some strategies for doing this:

- After taking the Resident In-Service Examination (RISE), a tool developed by the ASCP to assess residents’ medical knowledge of pathology, make sure you review your overall results and your missed item descriptors and references.
Your Education and Training:

It’s Up to You

By Alison R. Huppmann, MD, FASCP,
and Thomas J. Bollinger, MD, MPH, FASCP
Resident Council Co-Chairs Huppman and Bollinger with 2009 ASCP Resident Leadership Representative Award winners Nicole D. Riddle, MD, PGY-3, University of South Florida College of Medicine, Tampa, FL, and Eric Yee, MD, Chief Resident in Clinical Pathology, Beth Israel Deaconess Medical Center, Boston, MA.
• Challenge yourself. Ask for difficult assignments and extra scope-rounds. Request opportunities to present complicated cases at conferences and to consult with clinicians.
• Talk with people in practice, especially recent graduates, and find out what difficulties they experienced early in their careers. Then assess your own knowledge and skills in those areas.
• Constantly ask yourself these questions, How will I handle this situation when I'm in practice? Do I really understand X? How will I diagnose Y when I'm on call?
• Study published guidelines for resident competency in both anatomic and clinical pathology.7,8

Here is something else to consider: Although we often feel pressure to prepare for RISE or board examinations, preparation for patient care (i.e., the daily practice of pathology) is paramount. Exam questions cannot adequately determine whether a newly minted pathologist can use a microtome, visit an operating room without contaminating a sterile field, obtain and convey pertinent patient information in a timely manner, or appropriately converse with patients, allied health professionals, and the occasional disagreeable physician. Nevertheless, these are talents every pathologist must possess, and your capacity to use them will be assessed when you enter the job market. Look for opportunities to develop them (go to www.smith.edu/cdo/students/handouts/skill-inventory.pdf for an extensive list of useful skills).

Use Your ASCP Resident Member Benefits

ASCP resident members should also take full advantage of their member status. As a member, you are afforded numerous educational opportunities at little or no cost that can enhance your knowledge base and skill sets. Consider attending one or more upcoming meetings and courses. In addition to providing excellent didactic material, they offer great opportunities to meet practicing pathologists and educators who share your interests. Another useful benefit available to resident members is the Resident Council Subspecialty Grant, which can be used to offset the cost of doing an elective rotation away from your home institution in order to augment your training (www.ascp.org/residents/grants).

In 2008 and 2009, ASCP and the American Pathology Foundation conducted a half-day session on laboratory management training at the ASCP Annual Meeting. The program covered informatics, skill sets needed to be a laboratory medical director, coding and reimbursement issues, and management and leadership skills. Speakers discussed examples of questions on management that could appear on RISE. Also at the Annual Meeting, Rush University Medical Center presented a two-day professional development workshop for residents. This program taught resume-writing and interviewing skills, job search techniques, and networking strategies. It also reminded residents to review their Web presence.

We look forward to seeing how those charged with the responsibility of training the next generation of pathologists will improve the quality of pathology training, increasing the value of each newly trained pathologist, and ensuring the viability of our profession. In the meantime, it is up to each of us to take ultimate responsibility for our professional training and to ensure that we are perceived as valuable assets indispensable to patient care.

Please send any comments, questions, or suggestions to ResidentCouncil@ascp.org.

References


Dr. Huppmann is a Fellow in Pediatric Pathology at Children's Hospital of Philadelphia, Philadelphia, PA. Dr. Bollinger is a Hematopathology Fellow in the Department of Laboratory Medicine and Pathology at the University of Minnesota, Minneapolis, MN.
How the West Virginia University CLS Program Was Saved
In 2003, the clinical laboratory science (CLS) program at West Virginia University (WVU), Morgantown, faced a perfect storm. Enrollment had dropped to 23 students in their junior and senior years, but the program had five faculty members and was running a huge deficit. The state budget was in crisis, and the university faced large budget cuts. WVU's Robert C. Byrd Health Sciences Center (HSC) had formed a priority action team to cut low-mission, low-margin programs. Unfortunately, the CLS program was one of the programs slated to be cut.

Fortunately, the program had several factors working in its favor. Faculty members were extremely dedicated, as was the associate dean for professional programs, MaryBeth Mandich, PT, PhD. I had recently assumed the chair position and was committed to the program, and Stephen L. Tancin, MPH, Vice-President for Ancillary Services for WVU Hospital, was a strong advocate. Furthermore, even before the budget cuts, it had become obvious that the program could not continue with declining enrollments. It would have to either grow or die. We had started strategic planning for growth prior to the crisis, so we were able to proactively approach the administration quickly with a counterproposal to shutting down the program.

CLS programs have had their popularity wax and wane in the past few decades. At the end of the dot-com boom, students were flocking into business and the life of a laboratory professional—with unpredictable hours, relatively low pay compared to those in business and commerce, and little opportunity for advancement—was not seen as attractive by college students. The first task was to market the program to the university’s own students and at the same time to provide a strategic plan to convince the administration that change was possible and that a thriving program would be, at worst, cost-neutral.
Marketing Approach

Our strategy was to position the Bachelor of Science in Medical Technology as an attractive alternative to the standard biology degree and as a gateway to many possible careers, including medicine, dentistry, and veterinary medicine. In addition, if the student did not get into a professional program immediately after college, he or she could support themselves with a decent salary while obtaining valuable patient care experience that would also be useful for the admissions process. Although this concept was somewhat debated by the faculty, we believe that having physicians trained in medical laboratory science (MLS) would help improve the standing of MLS professionals among physicians. This type of marketing approach, combined with fallout of the dot-com bust, immediately resulted in an increase in students.

As the next step, we envisioned expanding to a total MLS program that would comprise the traditional CLS program (formerly called the medical technology, or MT, program), a histotechnology (HTL) program, and a cytotechnology program. A master’s level program for pathologists assistants (PA) would be an additional career pathway. Since there are few PA programs, there is a high demand for PAs, and graduates command high salaries, we thought this program would help attract students, as students in the undergraduate MLS program could be directly admitted to the PA program. We planned to eventually add a Master of Science program in Molecular Pathology as well, possibly in conjunction with the forensic sciences department. To convince the administration that this was feasible, we presented a detailed business plan that included the following points:

- The programs will be profitable or at least budget-neutral (increased students, new HSC fees, and pre-MLS students’ tuition are credited to HSC).
- The PA program will increase enrollment (early admission for CLS/HTL students).
- The programs would have a higher student-faculty ratio with an integrated curriculum.
- The programs would allow for increased enrollment by adding new clinical affiliations.
- The HTL program director would also manage Tissue Bank/Translational Pathology Cores prior to implementation.
- The program would have WVU Hospital support.

With the assistance of Dr. Mandich and Mr. Tancin, our proposal was accepted by the dean and vice-president, and the CLS program was retained and a small amount of money was invested into it. The implementation proved to be longer and more arduous than expected. We were fortunate to recruit Martha J. Lake, EdD, MT(ASCP), as vice-chair for the MLS program. Planning a new program in a large state university is never easy, but Dr. Lake accomplished this with tenacity and grace. The process involved a self-study, justification, budget, and curriculum. The package had to go through multiple reviews at the institution. The process took months (it only felt like years) and eventually ended up at the WVU Faculty Senate and Board of Governors. Of course, accreditation by the National Accrediting Agency for Clinical Laboratory Sciences is necessary for our students, and the program was designed with the accreditation requirements in mind.

With the help of another new faculty member, Cheryl A. Germain, PA(ASCP), the PA program was adopted by the university. As part of the process, Dr. Lake and Ms. Germain actively recruited students and clinical sites for the CLS and PA programs, respectively, with placement of students throughout West Virginia as well as southwestern Pennsylvania, including Pittsburgh. The first PA class started in January 2008, and the first class graduated in December 2009 with full accreditation for the program.

Second Program

Since there were already two cytotechnology programs in the state, we decided our second program should be the HTL area of emphasis. Planning for the HTL program started in January 2008, with the recruitment of Kimberly M. Feaster, HTL(ASCP), as program director. The MLS faculty participated in planning for an integrated curriculum, which
contains 27 credit hours of core courses for both the HTL and the CLS programs. A student can spend about one additional year for dual certification as an MLS/HTL. The HTL program was adopted by the university early last year, and the university also approved the name change to an MLS program with two areas of emphasis: CLS and HTL. Recruitment for the charter HTL class is ongoing, with the first students set to matriculate in August 2010.

What is our reality in 2010 (Figure 1)? The MLS program has grown from 23 students in 2003 to 70 students in 2010. As the program started to grow, the dean of the School of Medicine also increased support. The program is financially self-sufficient; in fact, it is generating a small surplus. The first class of PA students has graduated; all are employed. The MLS program has grown and become more competitive; last year there were 17 on the waiting list. Graduates pursue careers in laboratories throughout the region, and some have used their degrees as pathways to careers in medicine and dentistry. Addition of the molecular pathology master’s degree is currently being considered. Only two members were added to the faculty for the MLS program despite the large increase in students. The only area of the vision yet unrealized is the cytotechnology program; there are currently two schools in West Virginia. Should this change, we now possess the resources and flexibility to respond. We are also considering the medical laboratory of the future to determine additional new and innovative programs, although Dr. Lake works hard to keep my visions checked by her ability to implement.

**Summary**

The most important take-home point is that a vision is realized only by careful step-by-step planning and execution. We faced the expected challenges with funding, personnel, space, and time. Although it took longer and more work than initially budgeted, this was also expected. When faced with issues, we extended our planning period, because failure is not an acceptable outcome when students are involved. Critical to our success was strict adherence to the business plan and management of incremental costs at a minimum. In today’s challenging environment, the luxury of many faculty and staff for few students is not sustainable.

Administrators of universities and hospitals are, however, happy to “make money on the margin.” As each of our programs started to thrive, the next steps were easier, as we had increasing support from university and hospital administration. Finally, to paraphrase the Master Card® commercial, facilities and supplies have defined values; the right people are priceless. As health care changes due to the translation of basic science discoveries into the clinical arena, we believe that our flexible curriculum will allow us to continue to innovate to serve the needs of 21st century laboratories.

Dr. Ducatman is Professor and Chair of Pathology, Associate Dean for Faculty Services, and Director of the National Center of Excellence in Women’s Health at West Virginia University, Morgantown, WV.
Pathologists are, at their core, educators. From Rudolph Virchow’s time forward, pathologists have taken pride in being the “teachers of physicians” and have eagerly assumed the task of training the health care workforce of hospitals and laboratories alike.

It was not surprising then that the Cleveland Clinic in Ohio, in planning a new national reference laboratory that would require 400–500 new health care workers, decided the best way forward was to “grow their own” through educational programs that would develop a health care workforce for the region.

As Vice-chair of Education, I was charged with directing this dramatic expansion of programs. Now, almost three years into the process, I have discovered that we are not only staffing a reference laboratory but also, more importantly, helping to rebuild a city.

In the summer of 2007 when the Pathology and Laboratory Medicine Institute (PLMI) of the Cleveland Clinic under the leadership of Kandice Kottke-Marchant, MD, PhD, finalized plans for the new national reference laboratory, it was clear that the current pool of health care workers in northeast Ohio would not support such a large endeavor.

PLMI had a top residency program for training pathologists and had recently begun to expand fellowship offerings in various subspecialties within pathology, commensurate with its stature as a large tertiary care referral center. But in the past 20 years its allied health programs, including medical technology and medical laboratory technician programs, had been either downsized or eliminated altogether, despite an ongoing shortage of workers in these areas.

Now, with unemployment reaching 10% in the city of Cleveland and even bleaker statistics from the neighborhoods surrounding the hospital campus, the time seemed right not only to rebuild the old programs and establish new ones, but also to create ways by which these programs would become more accessible and affordable to the growing number who needed jobs.

Restarting the Medical Technology Program

Our first efforts focused on the revival of the Medical Technology program. In the early 1960s, the Cleveland Clinic laboratories established itself as a clinical site for the medical technology training programs of a number of colleges and universities in the greater northeast Ohio region. However, by the end of the 1990s, financial resources and interest in continuing to build this program had dwindled, and in 1997 it was closed.

In 2004, because of high demand for medical technologists, efforts to restart the Medical Technology program began. At that time, Julia Sutch, MEd, MT(ASCP), with the help of educational coordinators and laboratory trainers, visited colleges and universities and, through collaborative efforts, developed a curriculum and faculty for the program.

In 2007, the school opened with six students. During this time, early plans for the new laboratory were developed, and it was clear that...
the demand for medical technologists for this venture would far exceed the supply regionally and nationally. Given this projected shortfall, plans were implemented to quickly expand the training program to allow for 24 medical technology students to complete their clinical training at the Cleveland Clinic main campus hospital by the year 2012. In April 2009, the program received accreditation by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) for the maximum time period.

Since the inaugural class, the program has continued to expand, with a current class of 10 and more than 50 applicants vying for the 12 positions for the July 2010 class. The students come from more than 15 academic partners throughout Ohio, including Youngstown State University, Kent State University, Miami University, and Cleveland State University.

Two programs of study are offered: Approximately half of the students are enrolled in so-called 3 +1 programs, completing three years in a Bachelor of Science program in Medical Technology plus the clinical year. The rest are enrolled in 4 +1 programs wherein a four-year Bachelor of Science in biology, chemistry, or other sciences is followed by the clinical year. To date, 100% of the MT students who have graduated from the program have passed the ASCP Board of Certification (BOC) certification examination.

As Program Director of the MT program, Ms. Sutch understands the importance of this program to both PLMI and the community. “The medical technology program that we provide at the Cleveland Clinic is the ultimate win-win endeavor,” she said. “We get very well-trained MTs and the students of northeast Ohio have a ready-made career, right here in Cleveland.”

To further expand the laboratory workforce, we have also increased support for clinical rotators enrolled in two other allied health programs, the Phlebotomy and Medical Laboratory Technician (MLT) programs. The former, a 10- to 12-month certificate program, and the latter, a two-year Associate Degree program, are available through community colleges that serve the greater Cleveland area. Students from Lorain County Community College, Stark County Community College, Cuyahoga County Community College, and Lakeland Community College are placed in one of eight hospitals within the Cleveland Clinic Healthcare System (CCHS) and overseen by the laboratory managers in each hospital.
These laboratories constitute the Department of Regional Pathology of PLMI, the result of a two-year-long laboratory integration effort, now chaired by Paul Stagno, MD, FASCP, of Fairview Hospital (CCHS) and administered by Gwen Goss, HT(ASCP), regional administrator. The laboratory managers from each hospital coordinate the assignment of rotators to their hospital laboratory, schedules, and evaluations. This coordination requires a close working relationship among the laboratory managers and the academic partners. Currently, there are some 10 MLT students and 17–20 phlebotomy students in the Department of Regional Pathology laboratories.

Partnering with Other Programs

Similar clinical partnerships with other allied health laboratory programs are in varied stages of development. A histotechnology program has been revitalized at one community college in greater Cleveland, made possible by the staffing of the course faculty from the laboratories at the Cleveland Clinic. In addition, current plans are under way for a new cytotecnology program directed by Sandra E. Dolar, SCT(ASCP)CM, to open at PLMI in July 2011. This facility will collaborate with universities and colleges in northeast Ohio in a way similar to that of the MT programs, providing a formal clinical year of training in the main campus Cleveland Clinic laboratory, giving the students the opportunity to see high-volume and complex cytopathology specimens.

Finally, through the efforts of Brad Skilton, PA(ASCP), Manager of Surgical and Autopsy Pathology, PLMI has finalized a relationship with the Master of Science in Pathologists’ Assistants Studies program at Rosalind Franklin University in North Chicago, Illinois. This relationship allows for PLMI to recommend two students from northeast Ohio to the program. Those students will then return to the Cleveland Clinic for their clinical training year and commit to staying on in CCHS.

All these programs require considerable resources and a large staff of both part-time and full-time laboratory educators. In addition to office space and education materials, the PLMI leadership has provided approximately two full-time physician positions and nine full-time administrative positions to support the educational programs in the institute. In addition, the PLMI faculty, fellows, residents, and laboratory professionals provide approximately 210 hours of formal teaching seminars to these programs across the CCHS each year. Finally, dedicated new educational space and state-of-the-art classrooms will be part of the renovations planned with the building of the new reference laboratory, scheduled for completion in December 2011.

Public Education and Outreach

Building educational programs and collaborations, however, is only part of the solution. To maintain a sustainable regional health care workforce and to ensure that the greater Cleveland community can take advantage of these programs, they must be accessible and affordable. To meet this requirement, we needed to educate the public about the careers that were opening up in the hospitals’ laboratories and to coordinate public education and outreach with a system that could capture those who might become interested at an early age and keep them in the pipeline. With this goal in mind, the Civic Education Laboratory Project was started.

Under the direction of Jennifer Abraham and Ms. Dolar, the Civic Education Laboratory Project has developed educational programs for children in grades K–12 throughout the region, introducing them to the hospital laboratory. For primary schools, she develops and presents programs to classrooms about what the hospital laboratory does and also builds curricula for the “Adventures in Health Science and Math” (AHSM—yes, the grade schoolers do call it the “awesome”) Program of the greater Cleveland Clinic Office of Civic Education Initiatives (CCOCEI). The program is active in six Cleveland public grade schools and provides primary school children with the opportunity to hear about and visit many areas of the hospital, including the laboratory. For high school students, the Medical Laboratory Internship Program is part of a larger CCOCEI program that also includes internships in science, pharmacy, nursing, radiology, and respiratory therapy. These internships provide a 10-week paid summer internship (40 hours per week). In the summer of 2009, more than 140 high school students from Cleveland participated. Some are now in their first year of college and on their way to careers in health care.

Additional Outreach

With the expansion of the MT, MLT, and phlebotomy training programs, PLMI has made the first step in providing Clevelanders and people throughout northeast Ohio with the skills they need to become part of a growing health care workforce. But to ensure that the people from the hardest hit areas of Cleveland can successfully complete this training,
additional resources are needed. Many of the people who have the greatest need for these jobs live only blocks away from the hospital. The challenges they face can best be appreciated by simply walking out the door of the laboratory and down the block. There, adjacent to newly built state-of-the-art medical buildings, are boarded-up houses, struggling schools, and profound poverty—the effects of an economy that never recovered from the loss of its manufacturing base in the 1970s. Remnants of the rich tradition from a more successful time are evident in some of these streets, where collapsing warehouses, dilapidated old homes, and forgotten parks built by Rockefeller money are targets of revitalization efforts by the city.

The resources to revitalize these communities must also include new skills and more education. To educate and train the people in these communities, the reality of their everyday lives has to be accommodated. Tuition forgiveness programs will allow them to enter these programs, but stipends for transportation, child care, and everyday living expenses are also needed to ensure their success. As a program director from one of the community college MLT programs told me, “There is a 50% dropout rate, not because of academic problems, but because of life problems—loss of day care, loss of housing, loss of any support that they had to make this work.”

Tuition reimbursement is available for anyone who enters the MT, MLT, and phlebotomy programs in exchange for a commitment of three years of employment within CCHS. In addition, after 90 days at CCHS, these workers, regardless of their area of employment or pay grade, receive a yearly tuition benefit of $5,000 for undergraduate courses and $7,500 for graduate courses to pursue more education as long as they get passing grades. Finally, a strong philanthropic effort is under way to develop a pathology scholarship program that will provide living stipends for those in need. Through the generosity of PLMI alumni and others, in only two years this new scholarship fund has grown to almost $10,000 and will continue to expand through considerable efforts now under way by the Cleveland Clinic Office of Development.

Summary

What began as a process to assemble the workforce for a new reference laboratory in the Cleveland Clinic PLMI has become something more—a broad-reaching, multifaceted relationship with the schools, colleges, and communities of Cleveland and an opportunity for mutual benefit through education and training. As pathologists and laboratory professionals, we have always taken seriously the responsibility of education. At the Cleveland Clinic PMLI, we believe that that responsibility extends beyond the traditional hospital walls. As we develop a new and expanded workforce for our laboratories, we are pushing the limits of education and harnessing its power to reshape the world. This venture requires more than resources; it requires vision. In 1916 in Democracy and Education, John Dewey wrote, “The conception of education as a social process and function has no definite meaning until we define the kind of society we have in mind.” Through the creative and collaborative efforts under way, PLMI is envisioning not only a world-class reference laboratory but also a better city.

Dr. Farver is Vice-chair for Education, Pathology and Laboratory Medicine Institute, Cleveland Clinic, Cleveland, OH.
Medical laboratory training programs are expensive to operate. Salaries for faculty with expertise, expensive equipment, and the high cost of reagents, test kits, and disposable supplies are not offset by the tuition gained from a few students. Medical technology (MT/MLT), cytotechnology (CT), and histotechnology (HTL/HT) programs are deemed “low-producing” programs in that the cost-per-graduate ratio is high. In times of economic difficulty, financial administrators at universities, community colleges, and hospitals search for the means to cut costs, which make these programs vulnerable targets for discontinuance.

Programs that survive have one thing in common—innovation. Although each program outlined in this chapter has approached survival differently, curricular change and new ways of recruiting and training students to maximize faculty time and talents are common themes. Online education, career-entry graduate programs, curricula which integrate multiple laboratory disciplines or specialties, and program consortia are the adaptations which many laboratory science training programs have employed.

Online Medical Laboratory Science Programs

In 2001 Weber State University [Utah] was the first program to develop online clinical laboratory science education for both the Associate and Bachelor of Science degrees. General education and laboratory science courses are offered online. Clinical experience is provided by the student’s employer. The University of Cincinnati’s online program allows medical laboratory technicians (MLT/CLT) to complete a Bachelor of Science degree in Clinical Laboratory Science while working in the profession.

In 2001, MLT Program Director Suzanne Campbell [PhD, MT(ASCP)] was challenged to cut program spending and increase enrollment. Seward County Community College is located in Liberal, Kansas, and serves the western part of the state as well as parts of Oklahoma and Texas. Discipline lectures are offered online and 90% of weekly lab activities occur in the clinical setting. Students who reside near the campus spend 5 days each semester on campus. A highly defined weekly schedule of laboratory activities, course goals, and learning objectives keep all students and clinical instructors on track. Medical laboratory technician students complete 480 hours of clinical training. The innovative program has increased enrollments in the seven years since its development, and an adjunct instructor now assists Dr. Campbell (e-mail correspondence April 7, 2009). These programs are among the growing number of distance education laboratory science programs offered throughout the United States.

Interdisciplinary Education and Collaboration

Karen Chandler [MA, MT(ASCP)], Assistant Dean and CLS Program Director at the University of Texas–Pan American [Edinburg, Texas], noted that faculty at her institution teach clinical microbiology to nursing and dietetics students as well as teach laboratory methods to physician assistant students. One faculty member teaches medical terminology online for other students on campus. By teaching outside of the CLS program, faculty generate close to 1,000 semester-hours credit. Faculty collaborate with other programs in research projects and receive credit on all publications and share indirect funding as available (e-mail correspondence, April 7, 2009).
Innovation and Survival
Program Consortia

When the Medical University of South Carolina [Charleston] program in medical technology program closed about 10 years ago, it sent shock waves through the medical laboratories in the state. Ann Beaman [MT(ASCP)SH], Program Director of the MT/CLS certificate School of Medical Technology at the Lexington Medical Center (West Columbia, SC), wrote that her institution and other South Carolina hospitals have partnered with Armstrong Atlantic University (AAU) in Savannah, GA, to provide lectures online to students with Bachelor of Science degrees. Student laboratory sessions on campus are not offered as all laboratory skills are taught in the clinical laboratories. Clinical internships are provided by hospitals affiliated with AAU. In addition to offering hands-on training, the affiliates pay student tuition and provide employment after graduation. Ms. Beaman suggested that similar collaboration between universities and health care organizations present a solution to save programs (e-mail correspondence, April 9, 2009).

Multiple Career Entry Options

At Thomas Jefferson University [Philadelphia], students in the Department of Bioscience Technologies can choose between undergraduate and graduate programs in biotechnology, cytotechnology, and medical technology. Part-time programs exist in molecular biology, blood banking, clinical chemistry, hematology, and microbiology. The University of Alabama Birmingham offers B.S. and M.S. career entry degree programs in Clinical Laboratory Sciences as well as an MLT to MT program. Program Director Janelle Chiacera, PhD, MT(ASCP), reports that a blend of medical technology and cytotechnology education is being studied. A recent addition to the Department of Clinical and Diagnostics Sciences is the 1-year program Master of Science in Biotechnology. The new Biotechnology concentration in the Clinical Laboratory Sciences graduate program (MSCLS) and the new graduate certificate program in biotechnology are UAB’s response to the high demand for workers in the biotechnology/pharmaceutical industry. Two new faculty members have been added to the department to train the 20 students who enrolled in the fall of 2009. The Biotechnology Program consists of three semesters of course work, a two-week internship at a biotechnology company, a research project, and a scientific poster presentation at the end of the third semester. A student can choose to complete 34 credit hours for the M.S. degree in Clinical Laboratory Sciences with a concentration in biotechnology or 20 credit hours for a Graduate Certificate in Biotechnology.

Career Entry-Level Master’s Program

In response to declining enrollments, the University of Tennessee Health Science Center (UTHSC) [Memphis] Program in Medical Technology has developed an additional option for students who have earned a baccalaureate degree in biology, microbiology or chemistry from a regionally accredited college or university. Students who have previously attained a B.S. at an undergraduate university are often unwilling or financially unable to attain a second B.S. degree in medical technology and are more enthusiastic to pursue graduate education. As the number of applicants for the Medical Technology program decreased, multiple options for attracting students were considered. These included an option for medical laboratory technicians (MLT) to complete a B.S degree in MT. While that option does improve the skills and training of individuals, it does little to alleviate the personnel shortage since it does not increase the number of laboratory practitioners in the field. Online programs were considered, but the faculty discussed the difficulty of teaching the visual arts of hematology and microbiology online and there was concern about maintaining the program’s high standards. The faculty also discussed the practice in universities of having bachelor/master students or master/doctoral students enrolled in the same course with additional assignments made for the higher degree.

UTHSC program officials consulted with the CLS faculty of Rush University, Chicago, IL, and Louisiana State University Health Science Center, New Orleans, LA, where similar programs existed and thrived. With the advice and the experiences of faculty in these programs, the UTHSC B.S. curriculum was modified to include graduate-level content. The new option earns students a Master of Science in Clinical Laboratory Science, Advanced Practice, following 24 months of study. In addition to their B.S. degree requirements, qualified applicants must have successfully completed a minimum of 30 prerequisite semester hours in the math and science courses required for the Medical Technology program. Students must also complete 44 semester hours of the undergraduate professional medical technology courses with a cumulative GPA of 3.0 or higher on a 4.0 scale to be considered for the M.S. program in the second year at UTHSC. Master’s level courses are taken with the B.S. in MT students in the second year but have higher cognitive level learning objectives to improve the learner’s critical thinking and problem-solving skills. To achieve these objectives, graduate students have additional assignments in each course including clinical rotations. These assignments include but are not limited to: additional reading assignments, essay test questions, journal critiques, case study presentations, concept maps, research papers, and independent learning assignments. Graduate students work with a faculty mentor on a master’s level project which is written in a format suitable for publication in a clinical journal. Projects are presented to faulty and fellow students upon completion.

Cytotechnology and Histotechnology Education Combined

There is significant and growing need to produce more histotechnologists for the state of Tennessee and the nation. Letters of support for histotechnology education from major employers and physicians indicate the urgency to develop this curriculum. In clinical practice, histotechnologists work closely with cytotechnologists, medical technologists, and pathologists. Much of the course content already exists within the current curriculum of the Master of Cytopathology Practice degree program in Cytotechnology. Given the current budget
constraints placed on the University of Tennessee, it appears logical to utilize existing courses as well as faculty expertise and equipment in the Department of Clinical Laboratory Sciences to develop curriculum for producing these much needed professionals. In addition, graduates of the program would have the value of an additional certification in histotechnology along with cytotechnology. Managers of anatomic pathology laboratories will have the benefit of a “value added” employee who will multi-function at a high level at career entry. Initial accreditation of the histotechnology component of the curriculum is under way, and the first class has been accepted into the blended program.

Conclusion

The programs described in this chapter are but a few examples of curricular innovation. The reader is advised to refer to the Directory of Online Clinical Laboratory Science Education Programs for more detail. The Education Scientific Assembly of the American Society for Clinical Laboratory Sciences published the Directory of Programs approved by the National Accrediting Agency for Clinical Laboratory Science. Revised in January 2009, the Directory lists online programs that fall under one of four categories:

- Clinical Laboratory Technician (CLT)
- Clinical Laboratory Science (CLS)
- CLT to CLS articulation programs
- Graduate programs in Clinical Laboratory Science.

At a time of national medical laboratory workforce shortage, a choice of career entry options helps draw potential students and prepare them for careers in the 21st-century medical laboratory.

Resources

Pathology residents have a lot to deal with, from the obvious (the voluminous material and data of pathologic diagnosis), to the obscure (figuring out how a particular attending likes to sign out cases). One source of anxiety for pathology residents is the annual Resident In-Service Examination (RISE). In groups large and small, residents have voiced their uncertainty about RISE. What is this examination all about? Why do residents take it? How are the results used and are the results truly valid? This article is meant to answer such questions and hopefully prevent residents from losing sleep over RISE.

What Is RISE?
RISE is developed and administered by ASCP, in collaboration with the Academy of Clinical Laboratory Physicians and Scientists (ACLPS) and the Association of Directors of Anatomical and Surgical Pathology (ADASP). RISE is a comprehensive examination that assesses medical knowledge, one of six competencies defined in the Accreditation Council of Graduate Medical Education (ACGME) Outcomes Project.

RISE results are used by programs as one evaluation tool to assess resident progress. The exam is organized along the disciplines of anatomic and clinical pathology in three main sections: (a) Anatomic Pathology, including Surgical Pathology, Cytopathology, and Autopsy/Forensic Pathology; (b) Clinical Pathology, including Chemistry, Hematology, Transfusion Medicine, and Microbiology; and (c) Special Topics relevant to both Anatomic and Clinical Pathology, including Hematopathology, Laboratory Administration, and Molecular Pathology (Table 1).

Since 1983, the ASCP RISE has been given annually; currently 100% of U.S. residency programs participate in it. Overall, the examination comprises 350–400 multiple-choice questions; more than half of the questions in the three Anatomic Pathology sections and in the Hematology, Hematopathology, and Microbiology sections are image-based (Figure 1). In 2010, RISE is being administered online between March 20 and April 7.

Table 1. The 10 Content Areas of RISE According to the Three Major Sections

<table>
<thead>
<tr>
<th>Anatomic Pathology Section</th>
<th>Clinical Pathology Section</th>
<th>Special Topics Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical Pathology (SP)</td>
<td>Clinical Chemistry (CC)</td>
<td>Hematopathology (HP)</td>
</tr>
<tr>
<td>Cytopathology (CP)</td>
<td>Hematology (HE)</td>
<td>Lab Administration (LA)</td>
</tr>
<tr>
<td>Autopsy/Forensic Pathology (FP)</td>
<td>Microbiology (MB)</td>
<td>Molecular Pathology Special Topics (ST)</td>
</tr>
</tbody>
</table>
Demystifying the ASCP Resident In-Service Examination

By Henry M. Rinder, MD; Elizabeth A. Montgomery, MD; and Jay Wagner, MBA, MLS(ASCP)CM

Each of the 10 content areas is scored individually, and there is a score for the total examination. All pathology residents in all years take the same examination; scaled scores are generated as linear transformations of the raw measure such that they are compatible across years and examinees. The intent is to permit comparisons among residents in the same postgraduate year (PGY) group within programs (Table 2), across all programs, and between yearly examination cycles to track each resident’s progress. Each resident receives a confidential report that includes missed questions, references, mean scores, and, starting in 2010, percentile equivalents for each content area and year of training, while program directors receive a similar but more detailed comparison of residents and programs.

How Is RISE Constructed?
The ASCP RISE committee comprises 25–30 pathologists at any one time. These volunteer members are charged with developing a new RISE examination for the early spring of each year prior to the boards. The development of questions by the committee and recruitment of volunteer question writers is a year-round effort. The committee has developed a topical outline and taxonomy to ensure that questions in the databank adequately cover the subjects of a particular content area. Each content area has at least two pathologists with acknowledged expertise in that field, and most have expertise in several content areas. RISE committee members come from academic communities and military medicine settings. RISE represents collaboration among ADASP, ACLPS, the American Pathology Foundation (APF), the National Association of Medical Examiners (NAME), and the American Society for Apheresis (ASFA) Graduate Medical Education Resources Committee. Each member is charged yearly with writing five new RISE questions and recruiting five volunteer expert pathologists who in turn write five new RISE questions. This collective effort ensures a yearly input of 450–650 new questions, and these are combined with previously unused questions in the databank.

Table 2. Example of Mean RISE Scores for a Residency Program in 2009*

<table>
<thead>
<tr>
<th>PGY Group</th>
<th>Total</th>
<th>Anatomic Pathology</th>
<th>Clinical Pathology</th>
<th>Special Topics</th>
</tr>
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<tbody>
<tr>
<td>Overall</td>
<td>470</td>
<td>492</td>
<td>509</td>
<td>464</td>
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<td></td>
<td></td>
<td>468</td>
<td>544</td>
<td>460</td>
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<td></td>
<td>495</td>
<td>412</td>
<td>467</td>
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<tr>
<td></td>
<td></td>
<td>484</td>
<td>484</td>
<td></td>
</tr>
<tr>
<td>PGY1</td>
<td>437</td>
<td>437</td>
<td>506</td>
<td>391</td>
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<td></td>
<td></td>
<td>377</td>
<td>534</td>
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<td>591</td>
<td>343</td>
<td>452</td>
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<td></td>
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<td>464</td>
<td>464</td>
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<tr>
<td>PGY2</td>
<td>485</td>
<td>496</td>
<td>500</td>
<td>493</td>
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<td></td>
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<td>574</td>
<td>426</td>
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<td>PGY3</td>
<td>474</td>
<td>525</td>
<td>500</td>
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<td>460</td>
<td>460</td>
<td></td>
</tr>
<tr>
<td>PGY4</td>
<td>510</td>
<td>525</td>
<td>535</td>
<td>500</td>
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<td>563</td>
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*Note: All scores used in this example are fictitious and do not reflect any actual scores.
All available questions are vetted and catalogued by the RISE committee. Some questions are excluded from consideration for various reasons, for example, when new scientific knowledge makes them obsolete. RISE questions are also evaluated by a psychometrician. Psychometrics is the study of measurement instruments such as questionnaires and tests and concerns the theory and technique of educational and psychological measurement. RISE uses psychometrics to identify questions that perform poorly in separating better performing examinees from others so that such questions can be eliminated from the final RISE scoring. Good questions are also defined by common-sense qualities; they must be relevant to all levels of residency training, representative of disease cases that residents should have encountered, and have illustrative images that are unequivocal. Based on these standards, some original questions are modified by the committee to achieve these standards, but each question is attributed to its original author and maintains a literature reference. The final selection and editing of questions for the examination is accomplished in the fall; ASCP staff then work diligently over the next few months to expedite this examination for its March–April test dates.

What Is the Purpose of RISE?

Until 2003, RISE was a paper-based, multiple-choice examination that used Kodachrome transparencies, was designed strictly for resident self-assessment, and was taken anonymously. Program directors received summary data only for their entire program. Beginning in 2003, at the request of the Program Directors section (PRODS) of the Association of Pathology Chairs (APC), RISE results evolved to become one set of resident evaluation tools for assessing Medical Knowledge, one of the six competencies set forth by the ACGME. In order to facilitate this purpose, the RISE format was converted to an online examination, and specific resident results are now confidentially reported to both examinees and program directors. The ASCP RISE is listed as a major component of resident assessment by most U.S. pathology residency program directors. Programmatic RISE results for the content areas can also be used to identify curricula that need improvement within training programs.

In addition to being a tool for self-assessment, RISE supplies educational feedback to residents. A comprehensive list of each item on the examination details the specific bulleted point of the question, for example, “Acute promyelocytic leukemia is associated with t(15;17).” For each resident, his or her individualized list of “Missed Questions” can be used to focus on those subjects that may need enhanced study or to refer to the listed literature reference for each question.

A Universal Evaluation Tool

RISE is designed to be a universal evaluation tool that permits a broader assessment of pathology training than that of the individual resident or program. In a collaborative pilot study in 2006, ASCP and American Board of Pathology (ABP) determined that there was an excellent correlation between absolute scores for PGY-4 residents in the three content areas of the Anatomic Pathology section of RISE and subsequent success on the ABP Certification Examination in Anatomic Pathology. The magnitude of performance improvement between the first and fourth years of training also correlated with subsequent success in passing the Anatomic Pathology certifying examination. RISE results from graduating seniors in 2008 and 2009 are about to be comprehensively evaluated in conjunction with success on the subsequent ABP certifying examinations, and an excellent correlation is expected.

RISE results are meant to highlight areas for improvement within residency training, and RISE provides a means for subsequent assessment of changes in resident teaching. Surveys of program directors have shown that RISE scores correlate with consensus opinions on those areas of residency training that are most difficult to teach. One identified area of difficulty in resident performance on both the RISE and ABP examinations is Laboratory Administration/Management. As a result of this issue, ASCP, together with APF, has developed and conducted a workshop on Laboratory Management Education at the 2009 annual APC/PRODS meeting.

Another product of the ASCP RISE is the associated surveys that are updated annually. These surveys are multipurposed. First, feedback from the residents about the examination itself is used to continually improve and update RISE. Second, demographic data are evaluated to inform the RISE committee about residency training standards and trends. Third, the demographic data are used to inform residents about the processes of applying for fellowships and jobs, trends in post-residency training and salaries, and other relevant career information. These data have been posted on the ASCP Web site in the past; data from the 2009 survey are currently being processed for publication.

What Is the Future of RISE?

The RISE committee is continually improving the quality of the examination by (a) increasing the depth and breadth of questions in all curriculum content areas, (b) finding outstanding digital imagery to highlight questions, and (c) continually updating questions to reflect changes in nomenclature and medical advances. Introduction of the ASCP Vault, an easy, fast, and convenient application for searching, downloading, organizing, storing, and sharing
pathology-related assets, is expected to provide a rich resource for developing future RISE questions. Currently, RISE is primarily an examination to assess Medical Knowledge; discussions have been initiated to determine whether RISE can be employed for other competencies, including advanced case-based problems for patient care and multiple linked questions for systems-based learning improvement. Whether the addition of virtual microscopy to the examination is of benefit to residents is also being evaluated.

Since 2006, graduating residents certified by the ABP must undergo a continual process of self-evaluation, assessment of skills and knowledge, and formal recertification. To that end, the ASCP RISE not only is an early exercise for residents to develop a comfort level with annual examinations, but also can serve as a template for other means of continual self-assessment now required for pathologists who must recertify with the ABP through the Maintenance of Certification program.

With the long-term success of RISE and the ongoing need for assessment tools, ASCP has embarked on the development of yearly in-service examinations for pathology fellows. The Fellow In-Service Hematopathology Examination (FISHE) was developed with assistance from the Education Section of the Society for Hematopathology and has been administered yearly since 2007. This examination was followed in 2009 by the Forensics In-Service Examination (FISE) in collaboration with NAME. In addition, a Transfusion Medicine In-Service Examination (TMISE) has now been constructed with the aid of the Graduate Medical Education Resources Committee of ASFA and will be available in the spring of 2010 for transfusion medicine fellows.

Summary

The ASCP RISE has been a valuable tool for residents and training programs, and we hope that this description of RISE dispels misconceptions and answers outstanding questions. Residents have used RISE in paper form as a past study guide, and it is anticipated that the Missed Question drill down currently provided will be a valid way to address knowledge gaps. Residents can take comfort in knowing that their RISE results are a good predictor of readiness to sit for the ABP certification examinations. Because self-assessment is now a lifelong professional tool, this original and continuing aim of RISE may help bridge this requirement from training to practice. RISE supplies program directors with a valid, standardized evaluation tool that permits comparison of their residents and their programs with others in the one competency of Medical Knowledge. RISE has been able to demonstrate inconsistencies in the effectiveness of residency training and stimulated coordinated efforts to improve those deficiencies.

In summary, RISE has evolved from the self-assessment tool that was originally envisioned to a comprehensive assessment of Medical Knowledge in both general and specialty pathology training.

Dr. Rinder is Professor of Laboratory Medicine and Internal Medicine (Hematology) at Yale University School of Medicine, New Haven, CT. Dr. Montgomery is Professor of Pathology, Oncology, and Orthopaedic Surgery at Johns Hopkins University School of Medicine, Baltimore, MD. Mr. Wagner is Manager of Examination Development & Outcomes Assessment Products at ASCP in Chicago, IL.
ASCP is your education home and professional resource throughout your entire career, helping you thrive and excel in your everyday practice. Working with you toward a common goal of addressing and meeting patient needs, ASCP provides quality customized and technology-enabled learning experiences through a collaborative network of systems, tools, faculty, learners and subject matter experts. The Society supports the professional development needs of its members by making continuing medical education (CME), continuing medical laboratory education (CMLE), and continuous professional development (CPD) priorities of the organization. The following is a list of programs available from April through July 2010, as well as resources available throughout the year.

April 2010

Live Events – Pathologists, Fellows, and Residents
April 8–14: Resident Review Course, Hoffman Estates, IL
April 12–14: Current Issues in Liver Pathology, Las Vegas, NV, 25 CME
April 15–17: Update in Pulmonary Pathology: Contemporary Classification and Diagnosis, Chicago, IL, 19.50 CME
April 19–21: Molecular Surgical Pathology for the Practicing Pathologist, Fort Lauderdale, FL, 22.25 CME

Live Events – Laboratory Professionals
April 1–16: 2010 Chicago Workshops for Laboratory Professionals, Schiller Park, IL, up to 7.0 CMLE in one day
April 20–23: 2010 San Francisco Workshops for Laboratory Professionals, San Francisco, CA, up to 7.0 CMLE in one day

Teleconferences
April 1: Molecular Diagnostics and Targeted Therapy for Colorectal Carcinoma (Molecular Diagnostics)
April 2: Standard of Care in Liver biopsy Evaluation: What Is It? And How Can It Be Used to Optimize Liver Biopsy Reporting? (Surgical Pathology)
April 6: Improving Patient Safety in Surgical Pathology (Surgical Pathology)
April 7: A Passion for Challenge (Lab Operations)
April 8: Diagnosing Thyroid Follicular Lesions on FNA Biopsy: How Helpful Are New Immunocytochemical Markers? (Cytology)
April 13: Continued Importance of Blood Lactate Measurements in Critical Care (Chemistry & Immunohematology)
April 16: Well-Differentiated Lipomatous Tumors: A Common and Challenging Problem to the Practicing Pathologist (Surgical Pathology)
April 20: Laboratory Testing in Hepatitis Syndromes: A Widening Spectrum (Microbiology)
April 21: Pathology: Error Reduction in an Error-Prone Environment (Lab Operations)

May 2010

Live Events – Pathologists, Fellows, and Residents
May 7–9: 2010 Toronto Weekend of Pathology, Toronto, Canada, up to 20 CME
May 17–21: Surgical Pathology of the Gastrointestinal Tract, Santa Fe, NM, 29.50 CME

Live Events – Laboratory Professionals
May 11–14: 2010 Baltimore Workshops for Laboratory Professionals, Baltimore, MD, up to 7.0 CMLE in one day
May 18–21: 2010 New Jersey Workshops for Laboratory Professionals, Newark, NJ, up to 7.0 CMLE in one day

Teleconferences
May 4: Why Is the Diagnosis of Type 1 von Willebrand Disease So Difficult? Clinical and Laboratory Considerations (Hematology & Coagulation)
May 5: Group B Streptococcus Update (Microbiology)
May 6: Endoscopic Ultrasound-Guided Fine-Needle Aspiration of Pancreatic Lesions (Cytology)
May 11: Non-RBC Components: Hemotherapy Decisions and Management of Transfusion Reactions (Transfusion Medicine)
May 12: Thromboelastography in the Clinical Laboratory (Hematology & Coagulation)
May 14: Legal Aspects of Phlebotomy (Phlebotomy)
May 19: Update of Newborn Screening in the Public Health Laboratory (Chemistry & Immunohematology)
May 21: Cool under Pressure: Survival Guide to Intraoperative Neuropathology (Surgical Pathology)
May 26: Using DNA-Based Testing to Manage Patient Care in Transfusion Medicine (Transfusion Medicine)
May 27: Liver Function Testing (Chemistry & Immunohematology)
May 28: Fixation Theory and Reagents (Histology)

June 2010

Live Events – Pathologists, Fellows, and Residents
June 9–13: Dermatopathology: Contemporary Diagnostic Criteria and Strategies, Santa Barbara, CA, 32.50 CME
June 23–25: Current Issues and Problems in Breast Pathology, New York, NY, 20.75 CME
Teleconferences

June 1: How Safe Is Your Laboratory from Occupationally Acquired Infections? (Microbiology)
June 2: The Impact of NAT for HIV-1 and HCV on Blood Donor Reentry (Transfusion Medicine)
June 3: Cervical Cancer Prevention in Vietnam: Lessons Learned (Cytology)
June 4: Chondroid Lesions of the Head and Neck (Surgical Pathology)
June 8: Low-Incidence Blood Group Antigens (Transfusion Medicine)
June 9: Molecular Methods to Support Infection Control and Prevention Programs (Molecular Diagnostics)
June 10: Introduction to Cytogenetics and Molecular Cytogenetics — Session 1 (Cytology)
June 15: Laboratory Diagnosis of Infections Caused by the Dimorphic Fungi — Culture, PCR, and Serology (Microbiology)
June 16: The Gram Stain, a Real-Time Multiplex Classic Test in the Molecular Era (Microbiology)
June 17: Introduction to Cytogenetics and Molecular Cytogenetics — Session 2 (Cytology)
June 18: A Practical Approach to Pulmonary Hemorrhage (Surgical Pathology)

July 2010

Live Events – Pathologists, Fellows, and Residents
July 26–30: Pathology Update: State-of-the-Art Diagnostic Approaches to Surgical Pathology, Montreal, QC, Canada, 33.75 CME

Live Events – Laboratory Professionals
July 27: 2010 Anaheim Workshops for Laboratory Professionals in conjunction with the American Society for Clinical Laboratory Science, Anaheim, CA, up to 6.5 CMLE

Online Education

American Journal of Clinical Pathology CME programs. Every month, several AJCP articles are offered to readers to earn 1.0 CME or CME/SAM credit per article.

Cytology eLearning Modules. Case-based educational programs in five content areas.
- GYN 2009 and 2010: Includes differential diagnoses, HPV types, and patient management
- Non-GYN 2009 and 2010: A variety of specimen types for diagnostic interpretation
- FNA 2009 and 2010: Specimens from a range of body sites for diagnostic interpretation
- Technical/Ancillary Studies 2009 and 2010: Includes molecular tests, IHC, and FISH
- Laboratory Management & Administration 2009: Includes ASCCP guidelines, Bethesda System, and CLIA
- Safety: Includes general laboratory safety issues, regulation knowledge, and fire safety

eCourses
- An Algorithmic Approach to the Diagnosis of Malignant Mesothelioma
- Confessions of a Laboratory Safety Officer
- How-Should-I Guide to Laboratory Quality Control
- Overview of Chemical Terrorism Agents
- Preparing for Large-Scale Emergencies and How Your Terrorism Preparedness Training Can Help
- Preventing Errors in the Hematology Laboratory to Improve Patient Safety
- Sample Collection and Anticipated Clinical Sample Flow Following a Chemical Exposure Incident –1.0
- CME, CMLE, or CME/SAMs
- Specimen Collection, Storage, and Packaging – Meeting requirements of CDC for Rapid Toxic Screen Analysis

Online Histology Education
- Self-Study Course: Special Stains on Liver Tissue and Their Impact on Diagnosis
- Self-Study Course: Taking the Guesswork Out of Antibody Titration
- Webcast: Fixation: First and Foremost
- Webcast: Optimizing Antibodies for Immunohistochemistry
- Webcast: Troubleshooting the H & E Stain
- Histology Online Package of 5-part series

Online Case Studies. Instant CME/CMLE Credit from a collection of continuing education exercises or the current year’s LabQ, CheckSample, and Laboratory Medicine CE Update.

On Demand Webcasts
- Hospital Point-of-Care Testing Issues and Solutions
- Inherited Thrombophilia Testing — The Inside Scoop
- Molecular Methods for Rapid Identification of MRSA
- Uncommon Antibodies for the Unsuspecting Technologist
- Tissue Identification for the Histotechnologist
- An Update on the Use of Pap Tests and Human Papillomavirus Testing
- Revisiting Repair on Gynecology Samples
- Biomarkers of Stroke — Current Status and Future Promises
- Understanding the Cost of Quality
- Swine Flu: Testing the Lab Response to an Epidemic — Now and a Glimpse of Possibilities
- The Reference Range Revolution - What Is Driving All the Changes?
- Hemoglobin A1C Issues and Opportunities
- Error Management in the Cytopathology Laboratory: Learning from Our Mistakes
- Learning From Our Mistakes: A Variety of Diagnostic Pitfalls in Gynecologic Cytopathology
- Maximizing Employee Performance: The Art of the Relationship
- Quality Control Do’s and Don’ts in Pathology Laboratories
- Case Studies from the Pediatric Hematology Laboratory
- Pre-analytical Variables in the Coagulation Laboratory - New CLSI Guidelines
- Molecular Diagnostics in the Community Hospital Setting
Phlebotomy A to Z: Using Critical Thinking and Making Ethical Decisions

The Positive Direct Antiglobulin Test — Where Do We Go from Here?

GYN Proficiency Testing
GYN PT. This CMS-approved gynecologic cytology proficiency testing program is designed according to federal CLIA regulations to test basic diagnostic skills for gynecologic cytology specimens.

GYN PT and Lab Comparison. Fulfills gynecologic cytopathology proficiency testing and College of American Pathologists (CAP) Laboratory Accreditation Program (LAP) requirements for interlaboratory comparison.

Self Study/Assessment Programs

Glass Slide Assessment Programs
- GYN Assessment 2009. A year-long program that includes 15 glass slide cases and educational material designed to assess interpretive skills in gynecologic cytopathologic testing.
- GYN Review. Supplement to ASCP GYN Assessment Program for additional exposure to 24 glass slide GYN cases for diagnostic interpretation.
- Non-GYN Assessment 2009. A year-long program that includes 20 glass slide cases and educational material designed to assess interpretive skills in non-gynecologic cytopathology.
- Non-GYN Review. Companion to ASCP Non-GYN Assessment. Includes 24 glass slide cases that help assess a team's interpretive skills and fulfill CAP LAP requirements for interlaboratory comparison.
- FNB Site-Specific Assessment. A year-long program that includes 24 cases and educational material related to specific body sites.
- FNB Review. Glass slide supplement to ASCP FNB Site-Specific Assessment. This program includes 48 glass slide cases to assess interpretive skills and fulfill CAP LAP requirements for interlaboratory comparison. Educational case studies are not part of this program.

Digital Image Programs
- Non-Gyn Digital Image Program. Includes 20 diagnostically interesting NonGYN/FNB cases depicted by high-resolution digital images, followed by interlaboratory statistics and detailed case discussions.
- Gym Digital Image Program. Includes 20 diagnostically interesting GYN cases depicted by high-resolution digital images, followed by interlaboratory statistics and detailed case discussions.

CheckPath. Year-long program with cases presented in the following areas:
- CheckPath Anatomic Pathology. 20 cases presenting neoplastic and nonneoplastic surgical cases.
- CheckPath Hematopathology. 20 cases presenting a spectrum of diagnostic entities in hematopathology.
- CheckPath Clinical Pathology. Body fluids, clinical chemistry/immunology, forensic pathology, hematology/coagulation, transfusion medicine, microbiology, and laboratory management.

CheckSample®. Monthly, case-based programs that cover major disciplines in anatomic and clinical pathology for self-directed learning. Topics:
- Clinical Chemistry 2010
- Cytopathology 2010
- Forensic Pathology 2010
- Hematology 2010
- Microbiology 2010
- Surgical Pathology I (with glass slides) 2010
- Surgical Pathology II 2010

LabQ. Self-based study to earn credits toward Certification Maintenance.

LabQ-P. A practical self-study program for phlebotomists with responsibility for blood collection, handling, and transportation to earn CMLE credits.

Publications
ASCP offers journals, books and an array of printed and online materials. Two new books were published in October 2009: Practical Diagnosis of Hematologic Disorders, 5th edition, and Integrated Hematopathology: Morphology and Flow Cytometry Immunophenotyping with IHC. The Board of Certification Study Guide 5th Edition (formerly the BOR Study Guide) has gone to press for a third reprinting since its release in 2009.

Online Transcripts
Track your progress in meeting your continuing education needs, including CMP and MOC, with a personalized online transcript. The ASCP transcript system offers the following tools:
- Reminder emails and alerts that help monitor progress
- MOC credit types (Part II - SAM and Part IV - QA)
- Automatic MOC credit updates
- Option to choose a credit type—SAM or CME—upon completion of an activity
- Updated certificates reflecting the MOC credit types
- Ability to record non-ASCP credits
- Credits for live events to reflect the number of hours actually attended
- Summary of credits earned
- Search function based on date ranges
ASCPC NEWS

ASCP Works to Save CLS Programs

ASC P is working to prevent clinical laboratory science (CLS) training programs from closing. While cognizant of economic realities, ASCP maintains that the country can ill afford to lose the programs that are training the next generation of laboratory professionals. ASCP welcomes the opportunity to work with CLS program administrators to shed light on the workforce shortage and the need for programs that produce qualified laboratory professionals to fill the current and anticipated gaps in the workforce.

ASCP has participated in advocacy campaigns targeted toward Arizona State University, the University of South Alabama, Western Carolina University in North Carolina, Renton Technical College in Washington state, and most recently the University of Nevada at Las Vegas. Clinical Laboratory Science and Medical Technology programs are not the only ones in jeopardy. Histotechnology, Cytopathology and Phlebotomy programs have also been threatened with closure.

Last year, there was some degree of optimism that money in President Barack Obama’s stimulus package, as well as Department of Labor (DOL) grants marked for health care professions training, might be the catalyst to securing funds that would keep these programs afloat. These dollars were to be available for projects that provide training and placement services to help workers pursue careers within the high-growth health care sector. The purpose of the high-growth and emerging-industries grants is to teach workers the necessary skills for, and help them pursue careers in, health care. The DOL intends to fund 45–65 grants ranging from approximately $2 million to $5 million. Last year, representatives of a number of schools with laboratory professional training programs notified the Society that they intend to seek DOL funds. To date, many of the applications submitted remain in limbo and funding available to stave off school closures remains uncertain.

Despite the tenuous status of these university programs, there is a bright spot. St. Paul College in Minnesota, along with its industry and educational partners, was awarded a DOL grant in 2008. The DOL grant of $2 million has grown to $3.2 million through leveraged resources from industry partnerships. Its purpose is to expand enrollment and produce more graduates in the clinical laboratory science profession.

Healthcare Education-Industry Partnership is a task force established 10 years ago and spearheaded by Minnesota State Colleges and Universities (MnSCU) to address clinical laboratory workforce shortages. The DOL grant acknowledges the need for this innovative pilot program to address the clinical laboratory workforce shortage in Minnesota and across the nation. Minnesota’s approach could serve as a model for other CLS programs. It remains to be seen whether an economic upswing will have a direct impact on the threat to laboratory education. The need for highly qualified trained laboratory professionals remains. ASCP will continue to work with individual programs and coalitions to stave off closures and to draw attention to the field and its critical importance to medicine. ASCP will also seek innovative solutions to maintain and grow these vital programs.

Ms. Hill is Senior Manager, Advocacy and Quality Laboratory Practice, at ASCP in Washington, DC.
Making News

ASCP works with the news media to raise public awareness of pathology and laboratory professionals. Reporters increasingly look to ASCP to provide information on the workforce shortage, career opportunities, gene patents, cervical cancer screening, and more. Head to the ASCP Newsroom (www.ascp.org/Newsroom) to read news stories, hear audio clips, and see video of ASCP members making news that effects a difference. ASCP has added three members to the Society’s network of media spokespersons. For a complete list, visit the ASCP Newsroom at www.ascp.org/Newsroom. The new spokespersons are:

Susan R. Besaw, MBA, MASCP, SCT(ASCP)
Director of Customer Service, Plus Diagnostics, Union, NJ
Expertise: Laboratory management, workforce shortage, pre- and post-analytical testing

Junell M. Petersen, MS, MLS(ASCP)CMSH CM
Chair, ASCP Council of Laboratory Professionals Outreach Coordinator for Laboratory Services, Rice Memorial Hospital, Willmar, MN
Expertise: Direct access laboratory testing, laboratory personnel licensure, laboratory regulations

M. Sue Zaleski, SCT(ASCP)HT
Laboratory Manager, Department of Pathology, University of Iowa, Iowa City, IA
Expertise: HPV/Pap issues, Laboratory workforce shortage

In Brief

- ASCP leaders will visit lawmakers in Washington, DC, April 18–20, 2010, to advocate for pathology and laboratory medicine.

- In February, Janice M. Conway-Klaassen, MT(ASCP)SM, clinical laboratory science program director at the University of Nevada Las Vegas, was interviewed on “Face to Face with Jon Ralston,” an NBC-affiliate public affairs program in Las Vegas, about the proposed closure of the state’s only CLS program. ASCP issued an Action Alert urging members to contact lawmakers to intervene on behalf of the program.

  - In Virginia, legislation was introduced in January to require laboratory practitioners to register with the state Board of Medicine. To register as a medical laboratory scientist, the applicant would have to complete a baccalaureate degree and approved experience and training, and be certified. To register as a medical laboratory technician, the applicant would need to complete an associate degree and approved training, and be certified.

  - ASCP is working with contacts in Haiti to provide support of the national laboratory in the aftermath of the January 2010 earthquake to ensure that additional staffing needs and ongoing support services are met.

  - In January, the Wall Street Journal reported on a study that ranked the medical technologist as 30th and the medical laboratory technician as 37th in its list of top 200 jobs for the coming decade. U.S. News and World Report ranked the laboratory technologist among the top 50 jobs for 2010 and third in the health care category.

  - ASCP has produced a comic book featuring colorful stories about laboratory professionals. The book, sponsored by Roche, is available in bundles of 25 for $5.

  - Kelli Hutchens, MD, received first place in the ASCP Resident Research Symposium at the 2009 ASCP Annual Meeting in October in Chicago. Dr. Hutchens’ paper was titled “Less is more: Repeat HER-2/neu testing and universal implementation of fluorescence in situ hybridization.”

  - Follow ASCP on Facebook at www.facebook.com/ASCP.Chicago and on Twitter at http://twitter.com/ascp_chicago.

  - Did you know clinical scientists with PhDs are eligible for ASCP membership? Clinical scientists receive LabMedicine, online access to the American Journal of Clinical Pathology, Critical Values, Daily Diagnosis; and discounts to ASCP educational programs, products, services, and books, among many other benefits. Go to www.ascp.org and click on membership.
Robert O. Greer, ScD, DDS
Pathologist by Day, Novelist by Night

The characters in Robert O. Greer’s books reflect the people he grew up with in Gary, Indiana—salt-of-the-earth, working-class folks who worked hard in their steel mill town to achieve success. He holds tremendous respect for people who have the tenacity and wisdom to use their innate skills to be successful in life—whether a mechanic or a doctor.

Greer has taken his early roots and infused them throughout his literary works. The best-selling author has written 12 novels, most of them mysteries featuring streetwise African-American bounty hunter and bail bondsman CJ Floyd (The Devil’s Hatband, The Devil’s Red Nickel, The Devil’s Backbone, Resurrecting Langston Blue, The Fourth Perspective, The Mongoose Deception, and Blackbird, Farewell) and the medical thrillers Heat Shock and Limited Time.

Set against a backdrop of the new American frontier, Greer’s books have such themes as the power of friendship, love, forgiveness, and humor. His writings are dosed with a fair amount of medical mystery because, after all, Greer is a pathologist.

Greer is professor of pathology, medicine, surgery, and dentistry at the University of Colorado Denver, where he specializes in head and neck pathology. He’s been involved in cancer research for 35 years. In 1983, his research group reported a synergistic link between smokeless tobacco use and human papillomavirus in oral squamous cell carcinoma. That research serves as the foundation for the plot of The Devil’s Hatband.

Growing Up in Gary
“Gary was a great place to grow up,” says Greer, who turned 66 in March. “For those who didn’t go to college, there were lots of job opportunities. People tend to be happy when they’re working.” He worked in the steel mills every summer while aspiring to become a journalist and a doctor/scientist. His best friend became an orthopedic surgeon, and several other friends went on to become doctors, too.

Greer graduated from Miami University in Oxford, Ohio, in 1965 with degrees in journalism, chemistry, and zoology. He earned a degree in dentistry from Howard University College of Dentistry in 1969 and a pathology research degree from Boston University Medical Center Schools of Medicine & Graduate Dentistry in 1974.

It wasn’t until he was in his late 30s and established in his medical career that he decided to return to Boston University to study creative writing. “I wanted to polish my writing skills,” Greer says. When he was done, he returned to his pathology work in Denver and began to write short stories and, later, novels. He also holds an Honorary Doctorate of Humane Letters from Miami University.
Merging Two Passions

The parallels between pathology and fiction writing run deep, since pathology is about solving mysteries. Greer’s medical thriller *Limited Time*—about investigating the human life span—came straight out of the research lab. In the book, a brilliant molecular biologist studies telomerase, an enzyme that controls life span. In the process, he discovers a drug that can enhance athletic performance and extend the average life span. When he’s found dead, the results of his autopsy match those of a world-class collegiate swimmer who mysteriously collapses. Research pathologist Dr. Henry Bales suspects the two tragedies are linked.

Such storylines characterize Greer’s novels. He adeptly weaves his medical knowledge with strong, relatable characters and explores issues relevant to today’s world.

When he finishes work each day at the University of Colorado Anschutz Medical Campus in Denver, he returns home to write—longhand—for several hours each night. Greer, a widower since his beloved wife Phyllis passed away in 2002, also writes at his cattle ranch on the Laramie River in Wheatland, Wyoming, where he loves to fly fish and run the ranching operation.

Splitting his time between two successful careers comes naturally for Greer. “A lot of it is the way my brain is programmed,” he says. “I have a scientist’s brain as opposed to a writer’s brain. It allows me to be pretty organized. I can compartmentalize.” He also credits his unbelievable support staff, many of whom have worked for him more than 20 years.

His first literary novel—considered the most difficult style of fiction writing—*Spoon* was released in October 2009. “The novel is quite different from my other books, because it is a standalone literary novel of the contemporary American West about a mysterious, half African-American half-Indian strangely clairvoyant cowboy searching for his Western roots,” he says. The book has been a bestseller in the West and in California.

In 1986, Greer founded the High Plains Literary Review and continues to serve as its editor-in-chief. He is the author or co-author of three medical textbooks and more than 125 scientific articles. His short stories have appeared in dozens of national literary magazines and he’s written a short story collection, *Isolation and Other Stories*. Greer also reviews books for a Denver National Public Radio affiliate, KUVO.

Pathology Today

The choice of pathology as a career today has challenges different from those in Greer’s era as a medical resident at Boston University in the early 1970s. “When I was a resident, the amount of knowledge wasn’t as compounded as it is today, for example, with molecular biology,” he says. “You have to first master your craft and there is no way around it because the knowledge is so voluminous now.”
Besides investigating the role of human papillomavirus and p16 in oral squamous cell carcinoma, Greer’s research has centered on mechanisms of carcinogenesis in salivary gland tumors, specifically those involving the tyrosine kinase gene family, and epidemiologic and molecular studies of smokeless tobacco hyperkeratoses in Native American populations.

Greer can’t overstate the importance of strong mentorship. “Spend lots of time learning your craft,” he says. “Whether it’s medicine or writing, spend the time and have somebody who is really knowledgeable guide you.”

That’s precisely what he did. Greer credits Charles Balogh, MD, who was chief of pathology at Boston University Hospital and eventually a professor at Harvard Medical School before retiring. There was also Ronald A. DeLellis, MD, who was an assistant professor at Boston University and is now chairman of the department of pathology and laboratory medicine at Brown University. “His work on immunohistochemistry is second to nobody’s,” Greer says. Another mentor, Isao Katayama, MD—an assistant professor at Boston University who eventually returned to Japan to chair a medical school pathology department—is noted for his work on hairy cell leukemia.

“Three people who reached the pinnacle of pathology taught me,” Greer says. “I had enough sense to know these people were something. They became unbelievably skilled pathologists and took the time to teach me. I try to do the same myself. You have to spend the time to learn pathology. I tell residents it may be a different world than I grew up in, but we’re sitting here learning this for three hours for a reason.”

His creative writing mentor is equally accomplished. Acclaimed novelist Leslie Epstein has been the director of the Creative Writing Program at Boston University for more than 30 years. Epstein advised Greer to further develop his characters and to move from short stories to novels. Greer heeded his advice.

Greer is currently working on a novel titled First of State featuring CJ Floyd. Due out Oct. 1, 2010, the novel will be a prequel to the CJ Floyd mystery series. In the first CJ Floyd novel, The Devil’s Hatband, the bail bondsman and bounty hunter is age 44. In this new novel, readers will meet CJ more than 20 years earlier following his return home from Vietnam. For fans of Greer and his work, there’s no doubt it will be a great read.

For more information on Greer and his books, visit www.robertgreerbooks.com.
2010 ASCP Annual Meeting
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