Fused Diagnostics

Opening New Medical Frontier

Powerful Diagnostic Tools

Changing the Equation for Cancer
Fused Diagnostics

Fused diagnostics is revolutionizing pathology and laboratory medicine by providing a windfall of improved patient outcomes. Fused diagnostics involves applying algorithms to fuse molecular and other data, such as computational biology, genomics, and imaging, with analytic laboratory results for clinical and anatomic pathology. Fused data gives pathologists and laboratory professionals improved diagnostics of a patient’s personal medical condition, providing individualized approaches to diagnose and treat disease.

This new technology will also spur multidisciplinary teams of healthcare providers, uniting them under the umbrella of those delivering personalized medicine to patients. Diagnoses and treatment of patients will become a team effort with pathologists and laboratory professionals on the front lines.

Personalized medicine focused on patient-centric care will change how we organize and provide healthcare services. Instead of being concentrated in large hospital complexes, new patient-centric health services are expected to shift toward smaller clinics, surgical centers, and multidisciplinary physician practices.

Whole New World

It’s a time full of promise and opportunity as ASCP helps the entire laboratory team determine their new role as part of the multidisciplinary healthcare team. “It’s a whole new world,” said Wayne Grody, MD, PhD, FASCP, in the article “Fused Diagnostics Open New Medical Frontier.” Dr. Grody and John E. Tomaszewski, MD, FASCP, share their perspectives on how fused diagnostics, whole genome sequencing, and theranostics are changing the healthcare paradigm.

In this issue, ASCP President Joel M. Shilling, MD, FASCP, discusses how crucial good communication will be in the new world of fused diagnostics. Doctors have to understand test results, and the entire laboratory team is the best resource of knowledge and experience to educate them.

ASCP Council of Laboratory Professionals Chair Barbara S. Caldwell, MS, MT(ASCP)SH, discusses how laboratory professionals can help with personal profiles of patients such as HAS-BLED Score for major bleeding risk, and ABCD2 Score for transient ischemic attack. Theranostics caught the attention of ASCP Resident Chair Evelyn Bruner, MD, and she discusses the “ASCP Resident Road Map,” which aids pathology residents in setting yearly objectives and laying a solid foundation to become skilled pathologists.

Another aspect of fused diagnostics is detecting cancer early when the disease is easiest to treat successfully. Anthony M. Magliocco, MD, discusses the role of biomarkers and biobanks in answering critical questions about individual patients:

- Who needs extra treatment?
- What treatment is recommended?
- Who should avoid treatment?

Read the fascinating interview with Kimberly Allison, MD, author of Red Sunshine, one of the panelists for the general session about women’s health care, "Advancing Patient-Centered Care for Women Across Our Globe: The Laboratory is Part of the Puzzle," to be held on Nov. 1 at the 2012 ASCP Annual Meeting in Boston, Oct. 31–Nov. 3. Dr. Allison is one of many distinguished pathologists presenting at this year’s ASCP Annual Meeting. In addition to the stellar keynote speakers, other phenomenal speakers include Mark Synovec, MD, FASCP; Richard Mac DeMay, MD, FASCP; Ross Molinaro, PhD, MT(ASCP), DABCC, FACB; and Gene L. Gulati, PhD, SH(ASCP)DLM. ASCP members still have time to register for this pivotal educational event for the entire laboratory team.

Thank you for your continued support of ASCP. Please remember to send me your suggestions or comments at Blair.Holladay@ascp.org. My best to you.

Dr. Holladay is Executive Vice President of ASCP.
### Content

<table>
<thead>
<tr>
<th>Page</th>
<th>Article Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>About Critical Values</td>
<td>E. Blair Holladay</td>
</tr>
<tr>
<td>6</td>
<td>Leadership Messages</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Powerful Diagnostic Tools to Change Health Care</strong></td>
<td>Joel Shilling</td>
</tr>
<tr>
<td>10</td>
<td>New Healthcare Age Brings Promise of Significantly Improved Patient Care</td>
<td>Barbara S. Caldwell</td>
</tr>
<tr>
<td>14</td>
<td>Navigating Your Way to a Successful Pathology Career</td>
<td>Evelyn T. Bruner</td>
</tr>
<tr>
<td>36</td>
<td>Arts in Culture</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Biobanks and National Registry Change the Equation for Cancer</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Departments**

- **Powerful Diagnostic Tools to Change Health Care**: p.6
- **Biobanks and National Registry Change the Equation for Cancer**: p.16
in this issue

Fused Diagnostics

16 Biobanks and National Registry Change the Equation for Cancer
   David Brimm

20 Fused Diagnostics Open New Medical Frontier
   Sara S. Patterson

24 ASCP and Its Partners Develop and Improve the Global Healthcare Workforce
   Janet Franz

28 Knowing the Two Sides of Breast Cancer as an Expert and a Patient
   Sara S. Patterson

32 ASCP News
   2012 ASCP Annual Meeting

Critical Values

Music Prodigy Sees Colors in Music

Musical Prodigy Sees Colors in Music

Fused Diagnostics Open New Medical Frontier

Fused Diagnostics Open New Medical Frontier

p.20

p.36
Companion diagnostics, theranostics, genomic sequencing, personalized medicine, electronic health records, and telepathology: This is a small sampling of the terminology being used to describe the tremendous changes taking place in health care. And now we can add "fused diagnostics" to the list. Many people, even pathologists and laboratory professionals, are unfamiliar with fused diagnostics. A small but growing number, however, believe these new techniques will become powerful diagnostic tools that will greatly improve our ability to give patients quality personalized health care.

**Fused Diagnostics in a Nutshell**

An elementary form of fused diagnostics has actually been in use for years. Consider the case of a patient with a suspected heart attack who is given a physical exam...
and blood tests to check for cardiac markers. Then an electrocardiogram and chest X-rays are done. The information collected is independently evaluated; but diagnostic, prognostic, and therapeutic decisions are made based on the information as a whole using a multidisciplinary approach.

New, more powerful methods of fused diagnostics are being developed that will go well beyond this. They involve applying sophisticated algorithms to integrate, or fuse, molecular and other laboratory data with information collected using various imaging techniques and technologies. The fused data will give us new and more useful insights into a patient’s medical condition that will permit more personalized approaches to diagnosis and treatment.

Fused diagnostics will, of necessity, cross the boundaries that separate diagnostic specialties like pathology and radiology, and subspecialties such as molecular diagnostics. This, along with personalized medicine and patient-centric care, could lead to significant changes in how we organize and provide healthcare services.

**Changing Healthcare Landscape**

Tired of runaway costs and serious medical errors, many Americans believe meaningful change to our healthcare system is overdue. In 2009, the Institute of Medicine gave the medical community five years to improve the quality and safety of patient care or face government intervention. Meanwhile, we are also expected to drastically reduce healthcare costs.

It is easy to give ultimatums but not so easy to find concrete solutions to a very complex problem. If it is a systemic problem, the only way to fix it is to change the system. Fused diagnostics, patient-centric care, and healthcare reform are all attempts to do that.

We are already starting to see some changes. Traditionally, health services have been centralized in hospitals or large medical centers. New patient-centric health services, however, are more decentralized, with services being provided in smaller community-based clinics, surgical centers, and specialized physician practices. On the downside, members of a patient’s clinical team may no longer bump into each other in the hospital hallway. Instead, they may be practicing miles
Message from the President

away from one another, perhaps even in a different town or state. While this may benefit patients, it makes communication among clinical team members more difficult just when personalized medicine and more complex test results make good communication more critical.

At the other end of the spectrum is the shift toward a multidisciplinary approach to diagnosis. Some people are even advocating the development of integrated molecular diagnostic centers where specialists from different disciplines, such as pathology, radiology, and nuclear medicine, are combined into one department. Diagnosing patients becomes a team effort from day one.

Good Communication Essential

What role will the entire laboratory team play in our changing healthcare environment? It could be significant, because we actually have an extremely valuable contribution to make: knowledge desperately needed by clinicians. By "we" I mean pathologists, medical laboratory scientists, and other laboratory professionals. We are in a unique position to distill and interpret complex data and communicate it to other members of the clinical team, especially clinicians and patients.

The test results we give clinicians are usually numbers. We assume they understand what those numbers mean. But most do not. There is simply too much to know. Our body of medical knowledge grows every day. Michael Laposata, MD, PhD, FASCP, made a strong case for this in his keynote address at the ASCP Leadership Exchange in March 2009. He gave numerous examples of patients significantly harmed by a doctor’s failure to understand their test results. We need to stop making assumptions and be patient advocates by making sure clinicians thoroughly understand the information we give them and how it affects clinical decisions.

How do we do this? A written report is important, but it is not enough. And, frankly, there is no substitute for face-to-face communication. Clinicians can ask questions and get immediate answers, and diagnosticians can make sure clinicians truly understand test results and their ramifications. The immediacy and the give-and-take of face-to-face communication also help overcome information overload. This occurs when you are inundated with more information than you can readily process and use to make sensible decisions. When face-to-face communication is not possible, we have to find good alternatives. Fortunately, new information technology that may well solve this problem is proliferating, with great strides being made in web conferencing and digital teleconferencing.

If fused diagnostics proves to be as diagnostically useful as some think, it will have the potential to greatly benefit patients, but only if we can adequately communicate with clinicians and make sure they know what the results mean and how to use those results to help patients. I welcome any comments, questions or suggestions you may have. Please email them to me at President@ascp.org.

References


Dr. Shilling is the Medical Director, Radiation Safety Officer, and Technical Director of Toxicology at Quest Diagnostics, Portland, Ore.
As a Healthcare Professional, you deliver the highest quality of care.
We provide the highest level of protection.

Your membership with ASCP provides you with the opportunity to secure valuable protection for your income and for your family through ASCP Group Insurance Plans.

**ASCP Group Insurance Plans:**

- **Term Life Insurance** ensures that your family has the resources necessary to help meet financial commitments and achieve future goals.

- **Long-Term Disability Insurance** helps safeguard your income against disability, illness or accidents.

- **AD&D Insurance** helps you to be prepared for the unexpected.

Join the thousands of other members of your ASCP community who benefit from this quality MemberAdvantage Program!

**ASCP Members are Stronger Together.**

Contact us today for more information!*

Go to: [ascpinsurance.org](http://ascpinsurance.org)

Or call us toll-free: **1-800-865-2727 x1792**

---

*including cost, eligibility, limitations and exclusions

Plans arranged by RCM&D – Underwritten by New York Life Insurance Company, New York, NY 10010 on Policy Form GMR-FACE Arkansas License #311493 and California License #0057017.
Message from the Chair of the Council of Laboratory Professionals

By Barbara S. Caldwell, MS, MT(ASCP)SH

New Healthcare Age Brings Promise of Significantly Improved Patient Care

We are poised on the brink of a new healthcare age, one of increasing complexity with the potential to significantly improve patient care. Historically, laboratory professionals have consistently played an integral role in producing and managing diagnostic data. Using statistics and algorithms, these data can now be combined with diagnostic information available from other disciplines. It is expected that this integrated approach for interpreting patient data, called fused diagnostics, will provide more precise diagnoses and result in better treatment plans. The question is: What is needed to launch this fusion revolution and how can laboratory professionals contribute?

What it Involves

In fact, some fused diagnostics applications are already here—a byproduct of advances in molecular medicine and genetics and the trend toward personalized medicine.
Personalized medicine involves bringing the right care to the right patient at the right time. The power of fused diagnostics is its ability to help us deliver on this promise.

A heightened level of personalized care will be possible in the near future because of our growing ability to identify specific characteristics of an individual’s genetic makeup and use that information to develop targeted therapies, treatment plans, and prognostic indicators. Although every patient may receive this individualized care at one time or another, few will understand the complex steps necessary to achieve it.

The laboratory is primed to provide personal profiles of routine laboratory, genetic, and molecular menus; and the clinical team already has many useful diagnostic algorithms at its fingertips. One example is the HAS-BLED Score for major bleeding risk, which estimates the risk of significant bleeding for patients on oral anticoagulants and determines the risk-benefit in atrial fibrillation care. Another is the ABCD2 Score for transient ischemic attack (TIA), or “mini-stroke,” which estimates the probability of a stroke after a TIA, taking into account patient risk factors. Combining laboratory data sets derived from pathology, molecular, and genetic analysis with radiologic and other types of data (including algorithms like those above) enables the healthcare team to develop distinct diagnoses for individual patients.

**The Challenge to Survive and Thrive**

What will it take for us to survive and thrive in this fusion revolution? More than anything else, I believe we will need enthusiastic laboratory professionals! Individually we will constantly need to infuse the laboratory with the positive, creative thinking needed to help us ride the choppy
waves of the lean, cost-cutting environment that prevails in the healthcare profession. We all know we do meaningful work. This is why most of us continue in our careers. But how do we create an atmosphere where we can actually enjoy coming to work?

I recently purchased a SodaStream, a product that produces sparkling, carbonated soda from plain water and flavorings. It is surprisingly easy and inexpensive to create a bubbly carbonated drink without a factory production line. Likewise, it takes very little know-how or money to infuse your staff with effervescence and enthusiasm. It does, however, take commitment and compassion to enhance the workplace and make it a place people want to be.

Taking time to support and reward staff, for example, is more important than ever. We also need to instill in employees the desire and skills to convey information in a professional, consultative voice. We have knowledge the clinicians need, but we must come across to them as informed, well-organized, and credible. We must seize opportune moments to assist physicians with test selection and learn how to convey information in a clear, concise way. We must also ensure our staff members have a desire to learn and improve. We must teach them to use evidence-based best practices and encourage them to learn from one another by sharing experiences.

Defining Your Role

So how will we each contribute? We must begin by being the best of who we are. Each of us brings our own story and our own unique character and background to the laboratory. There we are fused together into a single, united laboratory staff; and there we will use our combined knowledge, experiences, and skills to help usher in the new healthcare age.

For example, I am the new Chair of the Council of Laboratory Professionals, and I am passionate about giving back to my profession. As a result, I have held numerous volunteer positions at ASCP. Professionally, I started out as a medical laboratory scientist on the bench and have worked as a hematology supervisor, a professor of laboratory science, and a laboratory administrative director. Thus, I was grounded as a bench tech, learned by teaching, and try to lead by example and action. I hope all my experiences will help me as I work with ASCP and other laboratory professionals to ensure the continued sustainability of our profession.

Ask yourself: "Who am I? What special or unique qualities do I bring to the table?"

To meet the challenges of the new healthcare age, we will have to blend our collective knowledge together and be open to new ideas and new approaches. Our goal will be to provide the right care to the right patient at the right time. To achieve this, we will depend on enthusiastic laboratory professionals who can harness their collective intellect and fuse together laboratory information with that obtained from different diagnostic specialties, thereby positively contributing to the overall diagnostic consultation process for improving patient outcomes.

I welcome your feedback. Please send your questions or comments to me at CLP@ascp.org.

Ms. Caldwell is Administrative Director, Clinical Laboratory Services, MedStar Montgomery Medical Center, Olney, Md.
Finish Your Bachelor’s Degree Completely Online

The University of Cincinnati online Bachelor of Science in Medical Laboratory Science is designed for working Laboratory Technicians who want to complete their bachelor’s degree from a NAACLS* accredited program and learn the skills necessary to become a Medical Laboratory Scientist.

Online Bachelor of Science in Medical Laboratory Science
800-556-4280
www.medlabscience.uc.edu/criticalvalues

*The National Accrediting Agency for Clinical Laboratory Sciences (NAACLS); 5600 N. River Rd., Suite 720, Rosemont, IL 60018-5119; Phone: 773-714-8880; Fax 773-714-8886; Email: info@naacls.org; Web: http://www.naacls.org

Adopt CLSI Document EP23 As Your Quality Control Option

CLSI document EP23—Laboratory Quality Control Based on Risk Management; Approved Guideline, Workbook, and Worksheet Package:

- Provides guidance based on risk management for laboratories
- Develops quality control (QC) plans tailored to a combination of measuring system, laboratory setting, and clinical application of the test
- Reduces risk through a comprehensive QC plan
- Helps you implement “The Right QC” plan

Find out more about this QC guideline, workbook, and worksheet package today.

610.688.0100 | F: 610.688.0700 | Toll Free (US): 877.447.1888 | customerservice@clsi.org | www.clsi.org
When I first learned that “fused diagnostics” was the theme for this issue of Critical Values, I was somewhat apprehensive. Because I was unfamiliar with the term, I thought I would have little to contribute. While researching and contemplating the topic, however, I came across the term “theranostics” as it relates to cancer. The word theranostics was created by combining two existing words: therapeutics and diagnostics. I realized that theranostics is a prime example of the concept of fused diagnostics.

Cancer theranostics is a fundamental aspect of pathology residency training. We are taught to make diagnoses and perform specialized molecular and genetic tests that guide clinicians in selecting targeted cancer therapies. This is the very essence of personalized medicine. Fused diagnostics is the combining, or fusing together, of diagnostic information acquired from different specialties. Fused diagnostics allows clinicians to make more specific diagnoses and choose more targeted therapies. In any case, it is one more subject we will have to master.
The Quest for Multiplicity

Actually, my research on fused diagnostics got me thinking about how much diversity exists within the field of pathology and the vast amount of knowledge pathologists are expected to possess. When we begin our first day of residency, we are making a commitment to a constantly evolving field of medicine. Thus, pathology residents must be proactive. Their educational and research choices need to be varied, and they should take advantage of as many networking opportunities as possible. Moreover, they need to do all this while transitioning from medical school training into residency training. It can truly be a daunting task.

During my first year of residency, I was immersed in the day-to-day activities of each rotation, whether it involved grossing, performing autopsies, reading out surgical specimens, or answering blood bank calls. At that point, I was not thinking about the bigger picture of my educational goals, much less about research projects or long-term career aspirations. I knew these things were important, but I was focused on the here and now.

With each passing year, I became increasingly aware of the need to expand my educational and career planning efforts. In retrospect, some early direction about what goals I should attempt to meet each year would have been exceedingly helpful. With this in mind, the Resident Council recently launched the "ASCP Resident Road Map," a guide for residents at every level of training. It is an online tool designed to assist residents in setting yearly objectives in their residency training and aid them in laying the solid foundation needed to become skilled pathologists.

Following the Resident Road Map

One of the great features of the road map is that it is based on a resident’s level of training, with a specific focus for each year. For example, if you are a first postgraduate year resident (PGY-1) who began your training in July, you are probably starting to settle into your role as a PGY-1. It can be a challenging transition with newfound autonomy, on the one hand, and with additional responsibilities for providing patient care, on the other. This is why the focus for PGY-1s is simply “Training your eye.”

According to the Resident Road Map, you should spend your first year laying a solid foundation in basic histology and pathologic diagnoses. However, it is also a good time to begin thinking about long-term career planning or to look for ways to make the most of your residency—starting at your own institution. In other words, do not do only what you must; explore additional ways to branch out and broaden your experience, knowledge, and skills.

As you advance in your training, the Resident Road Map reflects this progression by offering recommendations that are appropriate for your level of training. This includes items such as fellowships, licensure, and career advice. The focus for PGY-2s is to “Continue Developing Diagnostic Skills.” For PGY-3s, the goal is to “Take Advantage of Leadership Opportunities” and for PGY-4s, it is “Practice as Junior Faculty.”

Making Good Choices

On the most basic of levels, all pathology residents share the same goals. We must acquire the knowledge and skills necessary to become capable diagnosticians, including the ability to recommend appropriate laboratory tests, supply accurate test results, provide correct diagnoses, and deliver cost-effective quality patient care. Fused diagnostics, which exemplifies the complexity seen within the ever-evolving field of pathology, is simply the latest skill set pathologists must master. It is not the first, and it will not be the last.

The Resident Road Map was created to help residents make good choices at each stage of residency training. We hope it will enable them to make sensible choices about some of the most important career decisions they will have to make. However, it is only a guide. Every resident’s training is different, as are each resident’s long-term goals. Ultimately, we hope that the road map helps pathology residents in some small way as they journey toward careers in pathology.

Please visit the ASCP Resident Road Map at the ASCP website under resident resources at www.ascp.org/Residents/Resident-Resources#tabs-5. If you have comments or questions, please email me at ResidentCouncil@ascp.org, or contact your local resident representative. I would also like to extend a special thanks to the Resident Council members instrumental in creating the road map!

Dr. Bruner is a fourth-year pathology resident at the Medical University of South Carolina, Charleston, S.C.
Approximately one out of every 20 adults in the United States has survived cancer, including nearly one-fifth of all people over age 65, according to 2011 data from the Centers for Disease Control and Prevention and the National Cancer Institute. Statistics indicate that the number of cancer survivors increased by about 20 percent in just six years, to 11.7 million in 2007* from 9.8 million in 2001. In 1971, the number of cancer survivors was three million. About 65 percent of cancer survivors have lived at least five years since receiving their diagnosis, 40 percent have lived 10 years or more, and nearly 10 percent have lived 25 years or longer.

One of the keys to the longer survival rate is early diagnosis and treatment. And among the most promising additions to cancer detection and treatment is the role of the Cancer Biobanks and National Registry Change the Equation for Cancer
Registry and Tumor Bio-Repository, according to Anthony M. Magliocco, MD, FRCP, FCAP, who is Chair of Anatomic Pathology and Executive Director of Esoteric Laboratory Services at the H. Lee Moffitt Cancer Center, Tampa, Fla.

“In cancer diagnosis and treatment, tissue samples are gold, because they enable discovery and validation research that will lead to the development of new clinical tests aimed at more accurate and early detection of cancer, and improved assessment of tumors to enable more effective treatments to be selected,” Dr. Magliocco said.

While Dr. Magliocco acknowledges that cancer detection and tumor classification have greatly improved, there are still some recognized gaps in medical diagnosis and prognosis. They range from the need for better screening techniques, improved understanding of cancer prognosis, and the enhancement of the molecular classification of tumors; to the need for better understanding of the molecular basis of metastasis, the identification of biomarkers of radiotherapy response, and the implementation of improved markers of toxicity.

Biomarkers Are King

What these issues all have in common is the need for better laboratory tests, and it begins with biomarkers, which help pathologists “understand the spectrum of malignancies with applications in observational and analytic epidemiology, randomized clinical trials, screening, diagnosis, and prognosis. Defined as alterations in the constituents of tissues or body fluids, these markers offer a
means for homogenous classification of diseases and risk factors, and they can extend one’s basic information about the underlying pathogenesis of disease.”

“The diagnosis of cancers could be greatly enhanced if we gained better knowledge about specimen preservation to retain the sample’s molecular integrity, also taking into account nutrition, weight, age, and other patient-specific factors,” according to Dr. Magliocco.

He outlined the cycle of a biomarker: moving from discovery, technical validation, and clinical validation conducted in research laboratories, to clinical implementation and assay improvement conducted in hospital labs. The majority of the pathology surrounding total cancer care cases starts at the intersection of research labs and hospital laboratories.

Applying biomarkers to cancer patients, three critical questions arise:

- Prognosis: Who needs extra treatment?
- Prediction: What treatment is recommended?
- Toxicity: Who should avoid treatment?

Biobanks Supply Diagnosis Clues

At the heart of the diagnosis of malignant cancers is the emergence of biobanks, which store blood, tissue, hair, nails, urine, and other biological materials that allow pathologists to examine the interaction between genes and the environmental and lifestyle factors that are linked to cancers. Examining these materials leads to the development of targeted therapies and treatments.

Among pathologists, biobanks are creating a stir because the ultimate goal is to link biobank data and create a national cancer registry, so that pathologists can access tumors for study and specimen comparisons.

One of the inherent challenges of a biobank is convincing patients to voluntarily submit samples. Protocols are required that identify patients, obtain informed consent, and take into account privacy concerns. It also must be determined if a patient is infectious, and if access to medical records can be obtained.

Not all samples are acceptable for biobank storage. Acceptance is determined by preoperative and operative variables, including individual patients’ blood pressure, sepsis, nutritional exposures, toxic exposures, hormone effects, tumor effects, medication, anesthesia, the type of operation, treatments, and radiation.

Specimen Integrity Offers Dilemmas

Dr. Magliocco warned that integrity of specimens is critical. It must be determined who will collect the specimen, if it poses any risk to other specimens already collected, and if there are pre-analytical variations. The specimen must be verified, and the preprocessing and fractionation must be supervised. Particular concerns are avoiding “freeze-thaw” exposure and ensuring that specimens are labeled, so they can be tracked. The type of freezing is also important, primarily using liquid nitrogen, a mechanical freezer, and other storage units.

“Despite the good that comes out of biobank storage, it still comes down to satisfying some ethical questions,”
Dr. Magliocco said, “Informed consent is critical, but other issues arise, including whether a patient was coerced to submit a sample, if their privacy was compromised, and what happens if there is a withdrawal of consent, which, while rare, does occur.” He added, “It must be determined which assays will be performed and what happens to specimens if a biobank closes.”

Once specimens are collected, who decides how they are distributed becomes a paramount consideration. Often, specimens are reserved and are not available. Other times, for-profit companies seek access to specimens, which raises the questions of how costs will be recovered and whether this might impact specimen derivatives, such as DNA, RNA, and proteins.

Governance and management of a biobank will have a major impact on the quality and preservation of specimens, and how they can be accessed by pathologists. There needs to be a medical and scientific director overseeing the biobank, supported by an executive committee and a tissue distribution committee with appropriate staff.

This biobank oversight will be charged with collecting clinical data and determining what data is collected, as well as who will collect and curate the data. This will create a protocol for determining who has access to medical records, and who audits the collection and verifies its accuracy. Clinical updates also must be provided as well as assay results.

“The ultimate goal is to be able to use this new technology to link the pathology of cancers to the treatment of living patients,” Dr. Magliocco concluded. “One of the most exciting opportunities inherent in biobanks will be the opportunity for pathologists to diagnose rarer diseases and forms of cancer. As with many aspects of medicine, it will be challenging finding the funding for biobanks and the creation of a national cancer registry. I’m optimistic about the future and the enormous benefits it will create for pathologists in the diagnosis and treatment of cancers.”

* 2007 is the latest year for which figures were analyzed.

References:


Mr. Brimm is president of BrimmComm, Inc., Deerfield, Ill., a full-service communications company specializing in healthcare marketing and public relations.

**Personalizing Cancer Care for Patients**

Total Cancer Care™ is Moffitt Cancer Center’s comprehensive approach to cancer that enables researchers and caregivers to identify and meet all the needs of patients and their families during the patients’ lifetime and for future generations.

In 2003, Moffitt Cancer Center, located in Tampa, Fla., began developing Total Cancer Care, which is a holistic plan to improve the standard of cancer care by providing individualized, evidence-based treatment decisions based on the large-scale integration of information technology, scientific discovery, and health outcomes. This approach will provide evidence-based guidelines to improve care and outcomes for cancer patients throughout the state of Florida and beyond.

Total Cancer Care addresses cancer as a public health issue and takes a holistic approach by encompassing all aspects of the disease, including preventive measures such as the study of genetic predispositions, impact of health lifestyles, and effect of integrative medicine. Total Cancer Care follows patients throughout their lives, including during screening, diagnosis, and treatment of cancer. Translational research is incorporated at each step along this continuum of care and follow-up.

Its comprehensive approach makes Total Cancer Care more than just a registry, cohort study, or tissue bank. In addition, once a patient consents, the system collects clinical data throughout the patient’s lifetime, institutes a 100 percent electronic process, profiles all tumors, utilizes a multi-dimensional data warehouse architecture, and designs different views of access to the data for the patient, clinician, and researcher. Total Cancer Care efficiently collects and stores a very large number of samples and amount of information to provide in-depth analysis, which leads to improving the standard of care while addressing a specific patient’s needs.
The practice of medicine in the 20th century was centered on therapeutics, while the practice of medicine in the 21st century will have at its core the practice of diagnostics. “Fused diagnostics” is a special form of diagnostic practice that seeks to integrate primary data from different diagnostic modalities to create personalized signatures predicting a disease course or an individual patient’s likely response to a given therapy. According to John E. Tomaszewski, MD, FASCP, pathologists can use fused diagnostics to model the diseases of individual patients and make therapeutic decisions by using sophisticated algorithms, which integrate molecular and other laboratory data with information from imaging technologies. The fused data provides more insight into a patient’s medical condition, permitting more individualized diagnosis and treatment.

For example, breast cancer is no longer viewed as a single disease but many different diseases. A fused diagnosis of a patient’s specific form of breast cancer helps to determine which therapy will be most effective.
It’s changing all of cancer,” Dr. Grody said. “These advances allow us to set our sights more broadly. Pathologists need to take the plunge into this new technology and learn as much as we can from each individual patient in order to benefit other patients. At this stage, our technology has raced ahead of our knowledge of the basic biology of cancer, so we need to learn more. But that will come with experience. Pathologists are central to this effort as the curators of the tumors.”
“The goal is to predict which patients will have 100-percent responsiveness to a given therapy and to take away the trial and error,” said Dr. Tomaszewski, ASCP Immediate Past President and Chair of the Department of Pathology and Anatomical Sciences at the University of Buffalo, Buffalo, N.Y. “Pathologists and clinicians will do more work upfront, so there’s less guess work. The result will be lower costs and better outcomes for patients.”

**Tantalizing Possibilities**

Genomic sequencing for individual patients has opened a new frontier, where integrated teams of pathologists, physicians, and laboratory professionals will improve patient outcomes. As the fused diagnostic specialists, pathologists can now look at an individual patient’s genome and as part of a patient’s healthcare team determine which therapy is the best choice.

“It’s a whole new world,” said Wayne Grody, MD, PhD, FASCP, Professor of Pathology and Laboratory Medicine, Pediatrics, and Human Genetics at the University of California at Los Angeles School of Medicine. “This is the most exciting time of my career. Pathologists need to accept the challenge but also retain a sense of humility regarding the impact on patients’ lives. We can obtain the data, but we’re still figuring out what it all means.”

These new choices for diagnosing patients apply to many diseases but especially to different types of cancer.

“It’s changing all of cancer,” Dr. Grody said. “These advances allow us to set our sights more broadly. Pathologists need to take the plunge into this new technology and learn as much as we can from each individual patient in order to benefit other patients. At this stage, our technology has raced ahead of our knowledge of the basic biology of cancer, so we need to learn more. But that will come with experience. Pathologists are central to this effort as the curators of the tumors.”

Another new term—theranostics—describes the combination of therapeutic and diagnostic decisions in support of choosing the best care path for a patient. Theranostics associates a diagnostic test with a targeted drug therapy based on test results. This is a set of information beyond diagnostics. For example, analyzing a patient’s genomic data allows for a more targeted choice of therapy, which is the most important decision for that patient’s best choice in health care.

As genomic analyses accelerate, more than 4,000 new biological modifier tests are anticipated to come into the marketplace. “Choosing the right therapy will drive the effectiveness and efficiency of pathologists,” Dr. Tomaszewski said.

**Personalizing Patient Care**

How can pathologists integrate gene-based diagnostic tests into surgical pathology, cytopathology, and autopsy practice? Pathologists cannot do this alone, nor can oncologists do it by themselves. Even more than today, medicine will be a multidisciplinary team effort.

“Pathologists need to form partnerships with oncologists to deliver personalized medicine,” Dr. Tomaszewski said. “The rate of change is happening so fast that pathologists and laboratory professionals have to adapt. We are in a place where diagnostics are central to what needs to be done for patients.”

That means that pathologists have to step out of the laboratory and work with clinicians and other healthcare professionals to choose the right therapy for patients. “Pathologists have to collaborate with those who are experienced in molecular diagnostics and those with genomics training,” Dr. Grody said. “We also have to work with surgeons, surgical
pathologists, and geneticists. This is a team effort, involving an entire team of physicians and specialists."

The patients’ electronic health records are essential to facilitating teamwork between pathologists and other doctors. "Pathologists have to be active and identifiable voices on a patient’s electronic health record," Dr. Tomaszewski said. "Our data and our interpretations assist clinicians in selecting the therapies for the patients. Additionally, pathologists have to be available for immediate consultations with clinicians."

"A full family history on the maternal and paternal sides of the family, not just the parents, should be included in the electronic health record because it influences the way pathologists interpret patients' tumors," Dr. Grody explained. "Also, pathologists need to participate in tumor boards and consider accompanying clinical rounds to selected patients. Pathology questions crop up all the time in these settings."

**Conclusion**

Every day through advances in technology, fused diagnostics is becoming a more powerful method to improve patient care. Scientists and technologists are developing more tools that allow pathologists to fuse many more types of data, which more accurately predicts an individual patient’s responsiveness to therapy.

In the future, pathologists will be called on to make completely reliable theranostic statements. Fused data will be a critical tool that pathologists use to accomplish that goal. The best way to prepare for this challenging future is to begin using fused diagnostics for patient care now.

Ms. Patterson is Editor of Critical Values and ASCP Director of Communications.

---

**Medical Russian Roulette**

As the 21st century progresses, more patients who have gene alterations, in consultation with their pathologists and clinicians, will face choices like how long to wait before opting for preventive surgery. The risks are like playing a game of medical Russian roulette; it’s tough to know when the trigger will pull a live bullet such as breast or ovarian cancer.

Filmmaker Joanna Rudnick tackled the dilemmas that families face when generations show strong medical history of breast and ovarian cancer in the documentary "In the Family," produced in 2008. Breakthroughs in genetic research have made it possible for women and men in these families to be tested for the BRCA genetic mutation.

Women with the BRCA1 or BRCA2 mutations have up to an 85 to 90 percent lifetime chance of developing breast cancer and up to a 50 to 60 percent lifetime chance of developing ovarian cancer. This compares to an average woman’s lifetime risk of 12.2 percent for breast cancer and 1.7 percent for ovarian cancer.

When Ms. Rudnick was 27, she tested positive for the BRCA mutation. The clues to the BRCA mutation cropped up throughout her family’s medical history. Two great grandmothers died from ovarian and breast cancers. Ms. Rudnick’s grandmother developed breast cancer at age 56; her mother was diagnosed with fallopian tube cancer at 44. Her sister, Lisa, turned out to be negative for the BRCA mutation, which has a 50-percent chance of being passed from a mother or father with the genetic mutation to a child.

When her test was positive, Ms. Rudnick wanted to explore questions that this knowledge poses for patients, especially young ones, who discover they have the BRCA mutation.

- How much does an individual sacrifice to survive?
- At what point in a relationship does a woman reveal the truth of her diagnosis?
- How does a woman deal with the time pressures to settle down and have children?
- How does a prospective spouse handle knowing that his wife will probably have cancer or have preventive life-altering surgery?
- What is the responsibility for passing on the mutation to another generation?
- How long can a woman wait before scheduling preventive surgery?

Those dilemmas will happen more often as more genetic mutations for disease are discovered. In the age of genomics, more patients with their pathologists, clinicians, and genetic counselors will tackle these tough decisions.
When she embarked on her second trip to Africa as an ASCP Global Outreach consultant in 2010, Glenda Hood, MEd, HT(ASCP), was expecting to serve as an adviser to the histology instructor at the Kigali Health Institute in Kigali, Rwanda. When she arrived, however, she found out that the instructor, one of only a handful of pathologists in the entire country, had been called back to his hospital and would not be able to teach the class. Instead of considering it a wasted trip, Ms. Hood did what she is trained to do, albeit in a very different setting: She became the instructor.

“I sort of learned quickly to fly by the seat of my pants,” said Ms. Hood, Histology Program Director at Tarleton State University, Fort Worth, Texas. “I taught the class to second- and third-year students, but I did it in a much more abbreviated and speedy way because I had only a month. And even though I teach the same things [in the United States], I use lab space and teaching methods that are different from what they have the capability to do in Rwanda. It was very challenging. But it also was an absolutely wonderful experience.”

Ms. Hood is one of more than 50 consultants who have been working with ASCP Global Outreach around the world since 2005, when the U.S. Centers for Disease Control and Prevention (CDC) awarded the ASCP with a cooperative agreement as part of the President’s Emergency Plan for AIDS Relief (PEPFAR I) to train laboratory professionals, help universities strengthen their laboratory medicine curricula, and improve laboratories’ standards to meet accreditation in resource-limited countries. PEPFAR I was a $15 billion commitment to help countries around the world combat AIDS. Since 2008, when Congress reauthorized PEPFAR (PEPFAR II) at $48 billion for an additional five years, CDC has continued its partnership with ASCP Global Outreach through annual grants.

Filling the Gaps

In March, the CDC held a meeting with key partners that included ASCP, the African Society for Laboratory Medicine, and the World Health Organization (WHO), where the organizations discussed the huge need for clinical care and management of patients in PEPFAR–supported countries who are suffering from HIV/AIDS, tuberculosis, malaria, and other diseases such as cervical cancer. African patients have
Photos courtesy of Beverly Sumwalt and Judith Weeks

Counter-clockwise from photo below: Judith Weeks, MS, MBA, MT (ASCP), participates in a community service day with Dr. Odette Mukagayire, Director General of the Rwanda National Reference Laboratory in Kigali, Rwanda. Beverly Sumwalt, MA, MT(ASCP)DLM CM (center), speaks with colleagues, including Wendy Arnesan (right), at the National Institute of Pathology satellite laboratory in Rundu, Namibia. Ms. Weeks discusses chemistry documentation with a laboratory professional at the Rwanda Military Hospital. Ms. Sumwalt consults with a worker at the National Institute of Pathology satellite laboratory in Tsumeb, Namibia. Here is a family of cheetahs, which are indigenous to the region, in Rwanda’s Volcanoes National Park.
Get Involved: Become a Global Healthcare Leader

Working as an ASCP consultant can be a life-changing experience, according to Shannon Castle, Director of ASCP Global Outreach. Those who take part find it is a great opportunity to share their expertise with other laboratory professionals and often say that the experience helps them become better managers in their own laboratories.

The greatest need right now is for individuals fluent in Russian, French, Haitian Kreyol, Portuguese, Vietnamese, or Khmer who are able to conduct laboratory-related trainings in these languages, as well as those with experience working in medical laboratory educational programs, especially at the university level.

ASCP pays Global Outreach consultants a small stipend and covers their airfare, meals, lodging, transportation, immunizations, travel insurance, and visa fees.

To learn more and to apply to become a consultant, go to www.ascp.org/global-outreach.

Saving Lives

Reflecting America’s commitment to saving lives affected by HIV/AIDS, PEPFAR is supporting countries in providing HIV prevention, treatment and care to their people.

- The U.S. directly supported life-saving anti-retroviral treatment for more than 3.9 million men, women and children worldwide as of Sept. 30, 2011.
- PEPFAR directly supported HIV testing and counseling for more than 9.8 million pregnant women in fiscal year 2011. PEPFAR supported antiretroviral drug prophylaxis to prevent mother-to-child transmission for more than 660,000 of these women who tested positive for HIV, allowing approximately 200,000 infants to be born HIV-free.
- PEPFAR directly supported nearly 13 million people with care and support, including more than 4.1 million orphans and vulnerable children, in fiscal year 2011.
- PEPFAR directly supported HIV counseling and testing for more than 40 million people in fiscal year 2011, providing a critical entry point to prevention, treatment, and care.
- The U.S. is the first and largest donor to the Global Fund to Fight AIDS, Tuberculosis, and Malaria. To date, the U.S. has provided more than $5.8 billion to the Fund. Of the estimated 6.6 million individuals in low- and middle-income countries who currently receive treatment, nearly 5.6 million receive support through PEPFAR bilateral programs, the Global Fund, or both.1

24 percent of the world’s disease burden, but only 3 percent of the world’s health workforce and less than 1 percent of the world’s financial resources for health. The CDC wants to assist African countries to develop 140,000 new health workers, which includes not only doctors and nurses but also laboratory professionals.

To that end, since 2005, ASCP staff and consultants have facilitated more than 120 trainings, workshops, and mentorships as well as trained more than 2,200 laboratory professionals and medical laboratory instructors in 19 countries in Africa, the Caribbean, Central Asia, and Southeast Asia. With a focus on sustainability and building in-country capacity, ASCP’s consultants train in-country personnel to teach their colleagues and partner with in-country organizations in order to increase local presence.

“ASCP has been and will continue to be successful due to the skills and commitment of our consultants,” said Dr. Blair Holladay, ASCP Executive Vice President. “With more than 100,000 members, the Society has the capacity and expertise in pathology and laboratory medicine to direct our resources to many countries simultaneously. Additionally, ASCP’s partnerships with organizations such as the CDC, WHO, and the African Society for Laboratory Medicine expand our reach and influence to improve patient care in PEPFAR countries, where it is needed the most.”

Such impressive results would not be possible without the commitment of ASCP consultants such as Beverly Sumwalt, MA, MT(ASCP)DLM™, who has been on five Global Outreach trips—with another planned for this fall—in just the last two years. Her work in Namibia and Kazakhstan has focused primarily on ASCP’s Strengthening Laboratory Management Toward Accreditation (SLMTA) program, which provides trainers and mentors to assist in-country laboratory managers in such areas as productivity and inventory management, test result reporting, and quality assurance. The ultimate goal is achieving accreditation, via a checklist developed by WHO. Gaining accreditation demonstrates that the laboratories are doing high-quality work, which can lead to better patient outcomes and the ability to demonstrate value achieved using their funding sources, such as CDC funds for PEPFAR, she said.

“I usually am invited to train in quality management and process improvement,” said Ms. Sumwalt, a Healthcare Operations Associate for Booz Allen Hamilton and former hospital Laboratory Director in San Diego. “I go in and ask the laboratory managers: Where are you in relationship to the WHO standards? What are your processes, and how can you improve?”

Aiding the World Community

Adds fellow consultant Judith Weeks, MS, MBA, MT(ASCP): “The global community involved in the treatment and prevention of HIV/AIDS has to understand that a well-operated and accredited laboratory is crucial to everything. If you don’t have a laboratory that can give you reliable, accurate results, you’re not going to be able to properly treat patients with the antiretroviral therapies available.”
Ms. Weeks, an independent consultant in Delaware who has expertise in marketing clinical chemistry, cell biology, and immunology products, has traveled to Kenya once and Rwanda three times in the last two years to assist the ASCP effort. She has worked on a strategic plan for quality assurance, conducted a “training of trainers” session in chemistry, and assessed laboratories seeking accreditation. Consultants receive a specific assignment, “but you have to be adaptable to what the laboratory needs and how they work,” she said.

Such adaptability is second nature for the in-country laboratory professionals and instructors who work in the resource-limited areas that PEPFAR II is targeting, said JoAnn Fenn, MS, MT(ASCP), who has traveled to Tanzania, Rwanda, Kenya, Cambodia, and Vietnam since becoming an ASCP Global Outreach consultant in 2007. Her work has included curriculum reviews with microbiology laboratory training instructors that examine content, placement of courses, and objectives, as well as education methodology workshops to discuss how to create lesson plans, write appropriate objectives and test questions, and conduct interactive sessions with students.

“The instructors will show a lot of creativity with limited resources, and they’re hungry to learn and want to improve,” said Ms. Fenn, Medical Laboratory Sciences Division Head at the University of Utah School of Medicine, Salt Lake City.

She cites the case of an instructor in Tanzania who had never done a PowerPoint presentation, but worked over the course of the week to learn how. He then used the PowerPoint to “teach back” a learning module that was critiqued by ASCP consultants and his fellow Tanzanian instructors.

“He can go back and use that now,” she said. “He can show his students images in the PowerPoint that he can’t show them if he just stands up and lectures. If the instructors utilize such methodologies, it will improve classroom teaching.”

Sharing Knowledge

The ultimate goal is for the instructors who attend the ASCP workshops to pass along such educational knowledge to other faculty members when they return to their university or allied health school, said Travis M. Price, MS, MLS(ASCP), who has worked on revising medical laboratory science curricula during his five trips to Mozambique and one trip to Vietnam. This strategy is designed to have a greater impact and to more swiftly improve the curricula and methodologies used to train laboratory professionals.

“One of our focuses has been to incorporate more practical teaching,” said Mr. Price, who was an Assistant Professor of Medical Laboratory Sciences at Weber State University, Ogden, Utah, for nine years before moving to the University’s Health Sciences Department this year. “Instructors often don’t do as many laboratory functions with students as they could. We’ll show them how to take students into the laboratory and practice how to do things like blood smears or differentials.”

The ASCP work in Mozambique has been an ideal fit for Mr. Price, who learned Portuguese, the country’s official language, while serving a mission for his church in Brazil after high school. Now his goal is to travel for ASCP at least twice a year. The in-country instructors “have all the intelligence and all the capability but have been shortchanged on opportunities to learn skills and techniques,” he said. “And even though they’re 10,000 miles away, our science is the same and what we’re doing as teachers is the same. It’s important to help each other out.”

He isn’t alone in his enthusiasm. When Ms. Hood, the Histology Professor, was initially contacted by ASCP about traveling to Rwanda, she was hesitant. “Africa had never been on my list of things to do and places to go,” she said. “There’s lots of negative news coming out of African countries, and if you’re not informed, you think that’s all there is.” But now, after five trips to four countries in four years, during which she has had a hand in training a better workforce to fight HIV/AIDS, tuberculosis, malaria and cervical cancer, “I have no hesitation anymore,” she explained. “I just jump on the plane and go.”

References


Ms. Franz is a Chicago-based writer and editor.
We are entering the golden era for pathologists where the histologic, molecular, and genetic information we provide is being used in exciting new ways, and we need to educate clinicians and global health leaders about the value we provide as diagnosticians and consultants. It’s also important to remember the patient side and what our impact is for them. Every time we hear a patient story, we should take our jobs more seriously. We need to remind everyone in the laboratory that we cannot put that test off until tomorrow because someone is at home crying about it.

—Kimberly Allison, MD
Kimberly Allison, MD, knows both sides of the breast cancer experience: as an expert in breast cancer pathology and as a patient. Diagnosed with stage 3 breast cancer two weeks after she was promoted to be Director of Breast Pathology at the University of Washington Medical Center, Seattle, Dr. Allison wrote about her experience as a patient in her book Red Sunshine. Just 33 years old and nursing her second child in 2008, she turned a terrifying diagnosis into an inspiring memoir about her yearlong journey from diagnosis, treatments, and surgeries to survival.

At the 2012 ASCP Annual Meeting, Dr. Allison will serve as a panelist for the general session on women’s health care, Advancing Patient-Centered Care for Women Across Our Globe: The Laboratory is Part of the Puzzle, to be held on Nov. 1. Below is an edited interview with Dr. Allison about how her life has changed after breast cancer, why training pathology residents is so vital, and why she seeks more direct interaction with breast cancer patients.

**Question:** Why did you decide to serve as an expert panelist for the general session on women’s health care at the ASCP 2012 Annual Meeting?

**Answer:** ASCP has the right idea: focusing on how important the pathologist’s role is in making patient care a priority on a global scale. I am getting the message across with a personal story. It’s important to send the message that pathologists are a huge part of the healthcare team. Diagnostics are crucial to ensuring patients receive the right treatments. We are entering the golden era for pathologists where the histologic, molecular, and genetic information we provide as diagnosticians and consultants. It’s also important to remember the patient side and what our impact is for them. Every time we hear a patient story, we should take our jobs more seriously. We need to remind everyone in the laboratory that we cannot put that test off until tomorrow because someone is at home crying about it.

**Q:** Why is important to advance patient-centered care for women globally?

**A:** My perception is that some women, particularly in third-world countries, are shunned after being diagnosed with cancer. We know cancer patients are valuable members of society, and they can recover from cancer. As cancer survivors, we’re not lesser people because of our diagnosis and treatment. We need to educate people globally, so that cancer does not have a social stigma. When that happens, more women will be screened earlier and not diagnosed at stage 4.

**Q:** Why did you write the book, Red Sunshine, about your personal experience as a breast cancer patient?

**A:** I wanted to reach out to newly diagnosed breast cancer patients more directly and writing Red Sunshine was an effective way to do that. By sharing my personal story, I hope to help demystify what can be a very fearful experience. So the book is both personal and educational. As pathologists, we so rarely interact with patients. However, now I talk to support groups and oncology groups because I can be personal and help them both understand more about the biology of breast cancer and what it is like to go through treatment. I have even had some patients want to review their biopsies with me after reading my book.
Q: How has your experience as a breast cancer patient informed how you diagnose patients as a breast cancer pathologist?

A: I think it's really changed in several ways. I am keenly aware of treatment decisions for breast cancer patients. I have gone through almost every treatment available and know the clinical impact these can have on a patient. That knowledge makes me think very carefully about each detail of a diagnosis. Breast cancer diagnosis has become more complex; we cannot treat all breast cancers the same. Pathologists have to tell the oncologists more.

In breast cancer, it's all about the details of the patient's treatment. Is there focal angiolymphatic invasion or more extensive invasion? Does the sentinel lymph node have micrometastastic or macrometastastic disease? We find out more details about the biology of breast cancer by conducting ancillary tests.

If the cancer is hormone receptor positive, she may benefit from hormonally targeted therapies. If a cancer patient is HER2 positive, she can receive Herceptin or other HER2 targeted biologic therapies and increase her chances of surviving a more aggressive type of breast cancer. Because these studies make a patient a candidate for specific therapies, it is critical for us to get them right. I know personally how grateful I was to be a candidate for HER2 targeted therapy given how aggressive my cancer was.

Also, I take it seriously that tests, such as fluorescence in situ hybridization (FISH), need to be performed faster, so decisions about clinical care can be made more quickly. When a patient is diagnosed with breast cancer, it's a terrifying no man's land until the patient knows her treatment plan. Without a treatment plan, the patient's fears become magnified. I work with my colleagues to make the turnaround time in the laboratory faster for the right diagnoses.

Q: How has it changed how you teach pathology residents about the disease?

A: I teach the residents in the University of Washington Medical Center program about the clinical impact of diagnoses. When do they need to be wary of a certain test results? When do certain results need to be repeated? What are the red flags? When I tell them my personal story, it makes a big impact on trainees, so they think more about their role in patient care. We are training the next generation to consider themselves as diagnostic oncologists working with clinical oncologists.

Q: How has your own breast cancer diagnosis changed how you view the patients you diagnose with breast cancer?

A: Even before I was diagnosed with the disease, I always thought about the patients I diagnosed. How would their lives be changing because of a cancer diagnosis? Since I have now seen the other side of the disease, these diagnoses have become even more poignant. I know how hard it is to deal with the fear and uncertainty that can overwhelm you right after diagnosis and what a big difference a meeting with an oncologist or surgeon with a plan for you can make.

I want to do my job as a pathologist, so that the meeting can occur as fast as possible with the most useful pathologic information possible.
Q: How are you consulted on treatment options by other clinicians for breast cancer patients?

A: As pathologists, our job is to be consultants. When we are part of a multidisciplinary discussion or present at tumor boards, we are the advisers on when to repeat a test that makes a patient a candidate for a specific treatment or to guide a surgeon on whether or not to re-excite a margin. We also have to ensure that tissue is handled appropriately for future tests.

Sometimes I get the opportunity to directly interact with patients. I have met with patients interested in reviewing their pathology slides, and I enjoy this opportunity to directly interact. Because of my personal experience, I often find myself in an advisory role as well.

My medical knowledge helps me to counsel women on both their pathology and possible treatment options, as well as personal aspects of the experience. I try hard to do this in a balanced way, with the perspective of my own experience. I want patients to understand that what worked for me may not be the right answer for their form of breast cancer.

Q: In your book, Red Sunshine, you go through traditional treatment for breast cancer patients (two forms of chemotherapy and radiation), but you also try nontraditional alternatives such as acupuncture, meditation, and naturopathy. Do you recommend alternatives for other breast cancer patients in conjunction with traditional treatment?

A: I think it really depends on the patient and what they feel they can gain from the experience. While I knew that the chemotherapy, surgery, and radiation I was getting was going to treat my cancer, the rest of me needed healing as well.

Whether it is yoga, guided imagery, or a major dietary change, if it makes you feel healthier or in control without interfering with traditional treatment, I think it can be a positive addition. But I would not recommend skipping the conventional first-line treatment. The bottom line is to take care of your physical and mental health during treatment.

One nurse told me to get outside every day, something I did not really envision patients on chemotherapy doing, but it helped me to feel more alive and gave me more energy.

Q: In Red Sunshine, you describe the tremendous support you received from your husband, family, extended family, and friends. Does this make a difference for breast cancer patients?

A: Community is really important for breast cancer patients and cancer patients in general. A cancer diagnosis feels very isolating. Everyone reacts in a different way, but I found that support from my circle really helped me through. I even took charge and assigned people roles like who was going to research wigs or coordinate meals. It was also invaluable to have other survivors to share experiences with.

Cancer centers have an important role in facilitating patients talking to breast cancer survivors and providing other resources, such as meal services. No one should have to go through cancer treatment in isolation.

Ms. Patterson is Editor of Critical Values and ASCP Director of Communications.
2012 ASCP Annual Meeting to Celebrate Real Science, Real Life, and to Deliver Real Knowledge

Dr. Berwick, the former Administrator of the Centers for Medicare & Medicaid Services and author of two groundbreaking books about improving health care, will present the meeting’s Scientific Address on Friday, Nov. 2.

Like Dr. Berwick, the Annual Meeting’s other general session presenters—Ashley Judd, Laura W. Bush, Barbara Bush, and Giuliana and Bill Rancic—experienced personal and professional revelations that have cast them as genuinely engaged (and engaging) advocates for access to high-quality health care for patients around the globe.

Each of these dynamic keynote speakers is well acquainted with the power of the entire laboratory team in making the right diagnosis of disease and understands that the team’s diagnoses ensure that patients obtain the right treatments to restore good health.

“Health care is global, not just local. ASCP is showcasing a broader perspective of patient-centric care beyond the laboratory,” said ASCP President C. Bruce Alexander, MD, FASCP. “Additionally, the Society is gathering renowned experts in pathology and laboratory medicine to present knowledge and hands-on skills participants can apply immediately to improve their practices and laboratories. This combination of presentations facilitates and inspires attendees to improve patient care in our cities and in the international arena. We are continuing Dr. Paul Farmer’s urgent appeal to look beyond our borders, embrace our humanity, and enhance global health care.”

Expanding Perspectives

A humanitarian, actress, and advocate for public health programs across 13 countries, Grand Opening Keynote Speaker Ashley Judd, MPA, promotes conservation, social justice, alleviating poverty, and access to quality health care around the world. A tireless campaigner on these issues, Ms. Judd has served as an expert panelist or moderator for numerous conferences including the Clinton Global Initiative, Women Deliver, International AIDS, and the Global Business Coalition to stop HIV, tuberculosis, and malaria. Her address kicks off the ASCP Annual Meeting on Wednesday, Oct. 31.

Former First Lady Laura W. Bush, a strong proponent of global health, participated in the recent launch of the Pink Ribbon Red Ribbon initiative, which added cervical and breast health programs to the President’s Emergency Plan for AIDS Relief network of care worldwide. Former First Daughter Barbara Bush founded Global Health Corps to pair talented young professionals from the United States and abroad to work in year-long fellowships with organizations such as the Clinton HIV/AIDS Initiative, Women Deliver, International AIDS, and the Global Business Coalition to stop HIV, tuberculosis, and malaria. Her address kicks off the ASCP Annual Meeting on Wednesday, Oct. 31.

When entertainment journalist, author, and television personality Giuliana Rancic was diagnosed with early-stage breast cancer, she made the difficult decision to have a double mastectomy. She and husband Bill Rancic have publicly discussed how they coped with her diagnosis and treatment in an effort to encourage all women to be proactive about their health. The couple will headline the Annual Meeting’s Friday Evening Showcase on Nov. 2.

“Real Science. Real Life.” It’s an apt theme for the 2012 ASCP Annual Meeting in Boston—one that serves as a thread weaving together the personal stories and professional experiences of the committed healthcare advocates, outspoken celebrities, dedicated physicians, and foremost experts in pathology and laboratory medicine who gather this fall to offer a global perspective on patient-centered health care beyond the laboratory.

Donald M. Berwick, MD, the country’s leading advocate for high-quality health care, is among the general session featured speakers at the Annual Meeting, Oct. 31–Nov. 3 at the Hynes Convention Center. A Harvard-educated pediatrician, Dr. Berwick served 22 years as the president and chief executive officer of the Institute for Healthcare Improvement, a nonprofit dedicated to improving health care worldwide through the realization of the institute’s “Triple Aim” desired outcome: better care for patients, better health for populations, and lower per capita healthcare costs.
Serving as cultural agents for change, each of these high-impact keynote speakers has turned their visions of a better world into plans of action and is altering the way we think about global health care.

Enhancing Scientific Knowledge

Beyond this stellar cast of keynote presenters are four days of more than 160 customized educational programs that will expand your knowledge and enhance the practical skills of your entire laboratory medicine team. This year’s Annual Meeting programs offer insights into the latest trends shaping cytopathology, molecular pathology, personalized medicine, and leadership strategies for a more efficient lab.

This year’s meeting puts women’s health care front and center with an all-new health forum. “Advancing Patient-Centered Care for Women Across Our Globe: The Laboratory is Part of the Puzzle” explores the critical issues that affect the way physicians, lab professionals, and residents care for breast cancer and cervical cancer patients. Eric Bing, MD, PhD, MBA, Director for Global Health, George W. Bush Institute, will facilitate a candid discussion among a panel of three experts about diagnosing and treating these cancers in different parts of the world. The panelists include Kimberly Allison, MD, Director of Breast Pathology, University of Washington Medical Center, and breast cancer survivor; Doyin Oluwole, MD, Director of Breast Pathology, University of Washington Medical Center, and breast cancer survivor; and John Nkengasong, PhD, Chief of the Division of Global HIV/AIDS International Laboratory Branch, Centers for Disease Control and Prevention.

An impressive array of more than 165 innovators who are shaping the future of patient care are on the docket to present at this year’s meeting, including such renowned pathologists and laboratory professionals as:

- Richard Mac DeMay, MD, FASP, whose Oct. 31 program, “The Building Blocks of Cytopathology,” will offer a whirlwind tour of fine needle aspiration biopsy cytodiagnostics intended for pathology residents and pathologists who will be taking recertification exams.
- Gene L. Gulati, PhD, SH(ASCP)DLM, who on Nov. 1 will present “A Systematic Approach to Grading Blood Cell Morphology.” In this interactive session, he will address the varied approach to grading morphology among laboratory professionals and laboratories.
- Mark Synovec, MD, FASCP, deciphers trends in CPT coding in the Nov. 1 course “CPT Coding and Related CMS Payment Policy: Trends for Pathology and Laboratory Medicine.”
- David W. Glenn, MASCP, MLS(ASCP)CM, on Nov. 2 addresses “50 Ways to Lead Your Laboratory,” which will focus on how laboratory managers can accomplish more with fewer resources by developing Shared Management: Work Teams to improve productivity, raise morale, and increase staff retention.
- Ross Molinaro, PhD, MT(ASCP), DABCC, FACB, will share his insights about tests to monitor and diagnose diabetes in the program “Hemoglobin A1c: Potential Effects of Analytical and Clinical Factors on Result Interpretation” on Nov. 2.
- Sean M. Tucker, MBA, MLS(ASCP)CM, Carla Orner, MBA, MT(ASCP), and Connie Wilkins, MSHA, MT(ASCP), will present “Laboratory Medicine in the Midst of Disaster,” which will look at how to prepare for the unexpected.

During the Nov. 3 program, they will share details about instruments, reagents, procedures, and communication in disaster, including experiences encountered in tornadoes, earthquakes, and tsunamis.

Enlarging Medical Education

During this year’s Arthur Purdy Stout Lecture for Pathologists, Robert McKenna, MD, MASCP, will share his thoughts on one of the great success stories in hematology and oncology. His presentation, “Evolution in the Diagnosis and Prognosis of Childhood Acute Lymphoblastic Leukemia,” also will look forward to how new molecular genetic discoveries will create new opportunities for treatment.

Two named lecture programs, now in their second year, continue at the Annual Meeting. Robert Folberg, MD, FASCP, the Founding Dean of the Oakland University William Beaumont School of Medicine, will deliver the annual Michele D. Raible Lecture for Residents, which honors Dr. Raible’s commitment to delivering superior medical education and creating a lasting impact on the lives of medical students.

In his Nov. 2 presentation, “The Pathology-Time Continuum,” Dr. Folberg will share his perspective on the evolution of pathology and the impact it will continue to have on patients as new possibilities for laboratory medicine are uncovered.

Cynthia Johns, MSA, MASCP, MLS(ASCP)CM, SH(ASCP)CM, will be the featured speaker for the second annual Barbara M. Castleberry Lecture for Laboratory Professionals with “Doing What Inspires You,” which will provide insights into how to stay energized when faced with challenges in the laboratory. The lecture program honors Dr. Castleberry, a pioneer in modern laboratory medicine.

Lauding Leading-Edge Research

As at previous Annual Meetings, the ASCP will honor outstanding research in pathology, lab medicine, and education through poster sessions and oral abstract presentation competitions. This year’s competition offers a wide variety of categories, including “Best Poster by a Resident,” “Best Education Practice Poster,” “Best Lab Practice Poster,” “Best Scientific Poster,” and “Best Oral Abstract.” For the first time, the ASCP has accepted educational practice abstracts as well as lab practice and scientific practice abstracts.

The 2012 call for abstracts saw a 12.2 percent overall increase in submissions. The abstracts in the “Residents” category grew by 33.6 percent, and the “International” category received a jump of 37.2 percent.

The ASCP Annual Meeting offers more than an opportunity to hone your practical skills, learn about leading-edge professional resources, and hear from luminaries in the field; it’s a time to collaborate and connect with colleagues. This year’s new ASCP Commons in the Exhibit Hall will be the place to network, gain and exchange career advice, experience the Hands-on-the-Future Learning Lab in Science Connection Central, and gather in knowledge hubs with like-minded society members.

See you in Boston! Register today at www.ascp.org/2012-annual-meeting/register.html.
You can’t learn everything you need to know from this journal.

Sure, you can learn a lot. But not as much as you can at the 2012 ASCP Annual Meeting.

On October 31st, 2,000 pathologists, laboratory professionals, and residents will come together in Boston for four days of high-powered education for the entire laboratory team. Don’t miss your chance to be a part of it!
Sure, you can learn a lot. But not as much as you can at the 2012 ASCP Annual Meeting. On October 31st, 2,000 pathologists, laboratory professionals, and residents will come together in Boston for four days of high-powered education for the entire laboratory team. Don't miss your chance to be a part of it!

**Boston**  
**Oct. 31–Nov. 3**  
Hynes Convention Center & Sheraton Boston Hotel

**CUTTING-EDGE INSIGHTS**  
150+ educational courses on today’s trends and pressing issues for pathologists, laboratory professionals, and residents.

**EXPERT SPEAKERS**  
165+ of the most respected names in patient care.

**INTERACTIVE LEARNING**  
Hands-on opportunities to discover new technologies and share best practices with colleagues from around the world.

**REGISTER TODAY!**  
www.ascp.org/2012AnnualMeeting
Musical Prodigy Sees Colors in Music
As a baby, Laura Kathryn Rosser could hum perfectly in tune. As a toddler, she was playing piano by ear and learning to read music. By age seven, the musical prodigy started accompanying choirs, and went on to perform her first public recital at 11 years old.

Most unusual of all her accomplishments, Ms. Rosser has musical synesthesia—a condition that allows her to see colors in music. Whenever she plays music, she sees a specific color that corresponds to an individual note. Those who have perfect pitch, as she does, are more likely to have musical synesthesia.


During the last five years, Ms. Rosser’s career has expanded into psychotherapy, although she continues to play the piano. Currently, she is a doctoral candidate in religion, psychology, and culture at Vanderbilt University, Nashville, Tenn. In April 2002, Ms. Rosser married a fellow doctoral student, Kent Kreiselmanier.

The following summarizes an interview with Ms. Rosser about the gift of musical synesthesia and how it has affected her life.

**Question:** Why were you drawn to music and specifically the piano at a young age?

**Answer:** I honestly do not remember because I was so young. Both sides of my family are musical. They tell me I was humming melodies before I could talk; my ability came naturally.

**Q:** Did seeing colors when you played make it more fun to practice and then perform for an audience?

**A:** The interesting part—seeing color in music—did not become evident until later on. I had a Fisher-Price xylophone and its colored bars roughly correspond with the colors I see today for the pitch of an instrument or a voice. I was born with absolute or perfect pitch, so I seem to “know” the color of the note by its pitch. For example, D is blue and G is yellow. Before I learned about synesthesia in college, I thought it was just a quirk that I had.

When I attended music camp in my teens, I met another person who saw musical letters. Synesthesia is not as rare as experts used to think; approximately 2 to 4 percent of the population has some type of synesthesia. The most common form (which I also have) is to see colored letters and numbers. Colored music is a more rare form of synesthesia. Rarer still, synesthetes hear sounds every time they see motion. When I started researching it, scientists thought one person in 20,000 had it. Now the number is much larger.

**Q:** How has hearing colors in music enhanced how you play and how you view music?

**A:** For me, it deepens the emotional resonance and creates a more holistic mood. The more attention I pay to it, the more vivid it is.

**Q:** Have you enjoyed developing albums of your music?

**A:** My third album of original compositions called “Laura’s Christmas Creations,” in which I sequenced the tracks on my piano keyboard, was the most enjoyable. I “stacked” different instruments on top of one another, so it sounds like a full band or orchestra. Depending on the song, there are layers of piano, strings, saxophones, gospel organs, trumpets, and drums. I created most of the compositions in high school as Christmas presents for my family and friends. Then, several years later, I took the best of those songs and added two more selections with vocals that I sang.

Color plays into my music and is part of the fun of performing. When I worked with different soloists, I arranged the music to fit their voices. Sometimes I used colors to rearrange the music. For example, I would change the key from a dull brown to a vibrant red-orange.

**Q:** Do you see all the colors of the rainbow?

**A:** Theoretically, yes, but it does not work that way in practice. Some of the color spectrum falls between the notes in our 12-tone scale. There is a gap from yellow G to red-orange A-flat. I see more in the blues and less in the reds. I will see greens and purples. I do not know how or why, but for the enharmonic keys, the color may differ between a C-sharp and a D-flat even though they are in the same pitch. I can tell the difference if it’s C-sharp, which will be deep purple, while D-flat is periwinkle. Color defines the note. It’s one of those mysteries.

**Q:** I read in an article that one of your greatest fears is losing the ability to hear color.

**A:** I’m not sure where that quote came from. Sometimes people gain or lose synesthesia if they have some type of brain injury. If that happened, my life would be a lot more boring. Music would be more monochromatic.

**Q:** What would you do if you did lose that ability? Play less? Or play more to see if you could regain that ability?

**A:** I do not know; it’s involuntary. I don’t know if I could make it come back. Maybe it would if I concentrated really hard, as it seems to increase the more I attend to it.
Q: Despite your talent as a pianist, you are pursuing a doctorate in religion, psychology, and culture at Vanderbilt University. Why are you expanding your skills beyond music?

A: I was a ministry major in college and still performed music. Music is very much a part of my life. But I also have had some sort of spiritual calling.

When I was doing all these wonderful jobs, playing piano all over Nashville and enjoying myself, I thought something was missing. I am fascinated by people and discovered I have an interest in psychology.

As I became involved in a creative community in Nashville, I noticed that certain psychological patterns often correspond to creativity. Depression, alcoholism, or mood swings are more common among creative people. What’s happening spiritually? The same people who are vulnerable to depression also tend to have a more creative and spiritual side.

Someday, I would love to open an endowed center for integrated psychotherapy—with an interfaith chapel and music room where creative and colorful people who may be bipolar or have schizophrenia can come for holistic services that enhance the quality of life for the entire community.

Q: Will you continue to play the piano but more as a sideline?

A: I think I will. I would love to have a recording studio in the basement and perform on my own time. I really enjoy arranging and composing. For several years, my work centered on music and creative projects. Now that I’m an academic, my creative side has been mostly on hold.

Q: How do you see your career unfolding in the next 10 years?

A: I want to find ways to work part time from a home office to teach piano and to conduct pastoral psychotherapy. My husband wants to be a professor, and we will probably move when he receives an academic position. Our dream is to live in the Pacific Northwest.

Q: Is synesthesia hereditary or accidental?

A: Experts think it is genetic. For example, David M. Eagleman, PhD, has written about synesthesia as an inherited condition. Yet to our knowledge, no one else in my family has synesthesia. How it develops is still a mystery, but synesthesia seems to occur early in babies’ brains. One theory is that the neural connections between different senses are not pruned away in synesthetes as they are in most “normal” people. Genetic predisposition and early exposure to music may make a difference.

In my case, both my parents were musical. My mom grew up playing the piano and was trained as a math teacher, and she exposed me very early to the piano. My dad, who was never a professional musician, also grew up with lots of music throughout his family.

Q: How would you advise other people who have musical synesthesia to hone their skills?

A: There is a debate around whether musical synesthesia can be honed, similar to the debate about absolute pitch. Is it innate or can it be learned? Based on my own experience of simply “knowing” what pitch (color) a note is, I lean on the innate side of the argument. However, it does seem like my musical synesthesia is more intense when I focus my attention on the keys and their colors.

By the way, it turns out that lots of famous musicians have synesthesia—for example, Billy Joel and Itzhak Perlman see colored music as well.

Q: Is there anything that you would like to add?

A: I would really encourage spreading awareness of synesthesia. There is a correlation between high creativity and synesthesia. It’s important for doctors to realize that synesthetic patients aren’t hallucinating or just being metaphorical. In Nashville, many physicians are familiar with it through both documented research and personal experience with patients. We need to spread the word that synesthesia isn’t a neurological disorder but rather a real, scientific condition that many consider to be a gift.

* Dr. Eagleman serves in the Department of Neuroscience and Department of Psychiatry at Baylor College of Medicine, Houston.

Ms. Patterson is Editor of Critical Values and ASCP Director of Communications.
Healthy Benefits
Show your support for the American Society for Clinical Pathology and earn 1.25 MILES FOR EVERY $1 SPENT ON PURCHASES
If you choose the reward card

The American Society for Clinical Pathology has partnered with Capital One® to offer you three credit card options to fit your needs. Choose a card that earns you great rewards, one with a low introductory APR or another that can help you build credit through responsible use. Plus, you can choose an image for your card that highlights your support for ASCP. Apply today!

www.ascp.org/capitalone

Credit approval required.
Terms and conditions apply. Offered by CapitalOne, N.A.. © 2012 Capital One.
2012 ASCP ANNUAL MEETING

Real Science. Real Life.

Boston  |  Oct. 31–Nov. 3
Hynes Convention Center & Sheraton Boston Hotel

Find the answers to today’s most CRITICAL questions at the 2012 ASCP Annual Meeting.

How can we staff tomorrow’s labs?
What do you and the neurosurgeon really need to know?
Are you ready for the new cervical cancer guidelines?
Can you manage successful change in your lab?
Can you take a team approach to building annual antibiograms?
Is in vivo microscopy right for your practice?
What do changes in cpt coding mean for your lab?
What does patient-centered care really mean?
How can shared management work teams boost productivity?

Register now: www.ascp.org/2012AnnualMeeting