

ASCLS Annual Meeting 2014: Official Abstracts of Submitted Papers, Case Studies and Posters

Chicago, IL

The following abstracts have been accepted for presentation at the 2014 American Society for Clinical Laboratory Science (ASCLS) Annual Meeting and Clinical Laboratory Exposition to be held July 29 through August 2 in Chicago, IL. Abstracts are reviewed by members of the ASCLS Abstract Review Committee. They are the final authority in selecting or rejecting an abstract.

Papers, case studies and posters will be presented during the following times at the annual meeting.

POSTER PRESENTATIONS

Wednesday, July 30, 10:30 am-12:00 pm at McCormick Place; *Authors will be present on Wednesday, July 30 from 10:30am to Noon to discuss their work and answer questions.*

ORAL RESEARCH PRESENTATIONS

Wednesday, July 30, 3:30-5:00pm at McCormick Place.

Poster Presentation Abstracts

Blastic Mantle Cell Lymphoma: A Case Study

Wanda B Catt, MPH, MLS (ASCP)^{CM}, Halifax Regional Medical Center Roanoke Rapids, North Carolina

A 90- year old male arrived in the emergency room complaining of painful and increased frequency of urination. He denied any fever, chills, or pain. A routine laboratory workup was performed that included a CBC and Urinalysis. Laboratory studies showed a white blood cell count of 248.6 K/UL and a decreased hemoglobin and hematocrit. The peripheral smear demonstrated almost 100% atypical large blastic cells with high nuclear to cytoplasmic ratio, immature chromatin and conspicuous nucleoli. The patient was admitted to the hospital for further testing and a

Hematology consult was ordered. A bone marrow aspiration was performed which showed marked involvement by Blastic Mantle Cell Lymphoma. Flow cytometric analysis demonstrated 93.9% monoclonal, kappa restricted B-cells with the following immunophenotype: CD19+, CD5-, CD10-, CD38+, FMC7+, HLADR+, CD103-, CD34-, CD117-. The patient remained in the hospital for 16 days. During his stay, the patient was started on a treatment plan of chemotherapy and prednisone which resulted in anemia, which was treated with 3 units of blood and 2 units of pheresed platelets. Prior to discharge, his white cell count had decreased to 52,800K/UL. The patient was discharged to a convalescent facility and expired 30 days later. Blastic mantle cell lymphoma is a rare and aggressive type of Non-Hodgkin's Lymphoma. There are approximately 1,500 cases in the United States. It originates from the mantle zone of the lymph node and is often diagnosed in an advanced stage resulting in a median survival after diagnosis of 3 months.

Early T-Cell Precursor ALL in 5 Year Old Female

Bryan Danilchuk, BS, MLS(ASCP)^{CM}, Boston Children's Hospital, Boston, MA

A 5-year-old female presented with severe fatigue and fevers of two week duration and a large, painful skin lesion on the left calf. Upon initial laboratory exam, it was noted she was extremely pancytopenic with a peripheral blood differential revealing the presence of 8% blast cells. Peripheral blood immunophenotyping discovered the presence of both lymphoid and myeloid markers present on the blasts. A bone marrow aspirate and biopsy were performed and demonstrated 70% cellularity, composed of 90% lymphoblasts. The lymphoblasts expressed an immunophenotype of CD34, CD71, and CD11b. The majority of the cells also co-expressed CD7, CD13, CD33, CD56, CD123, and cytoplasmic CD3. The blasts did not express surface CD1a, CD3, CD4, CD5, CD8, CD10, CD16,

CD19, or CD20. They were also negative for myeloperoxidase, while expressing TdT. An immunophenotype with the absence of CD1a, CD8, and weak CD5, while expressing at least one of the following myeloid markers: CD13, CD11b, CD33, CD34, CD56, CD117, or HLA-DR, correlates with an extremely poor prognosis of early T-cell precursor ALL. The patient was started on an intensive chemotherapy regime and entered a continued remission after day 32 of induction.

Design of a Point of Care Device for the Rapid Diagnosis of Pertussis

Delfina C. Domínguez, PhD, XiuJun Li, PhD, The University of Texas at El Paso, El Paso, TX

Despite high vaccination coverage against pertussis in many countries for more than 50 years, *B. pertussis* continues to circulate. Pertussis is the only vaccine-preventable infection that remains endemic in the U.S. and worldwide. The purpose of this research is to develop a low-cost, paper-based microfluidic point of care device (POCD) for rapid, highly specific and sensitive diagnosis of pertussis that can be used in various venues such as physicians' offices, schools and low-resource settings. We have developed a fast, instrument-free detection method using a polydimethylsiloxane (PDMS)/paper hybrid microfluidic system integrated with DNA amplification. The system has been created consisting of 3 layers, a bottom glass plate and 2 PDMS layers. The top PDMS layer is for reagent delivery, and the middle PDMS layer contains multiple wells for DNA amplification. A piece of paper is inserted in each well to pre-store DNA primers. Our preliminary work shows that this instrument-free system has been able to detect specifically *B. pertussis* successfully by using a portable UV light pen. The degree of fluorescence can be easily differentiated between the positive and negative controls under normal daylight. Further work is underway to develop a fully integrated paper-based POCD. We expect to validate our POCD using clinical samples from pertussis cases. The impact of this research is broad. The POC device has great potential for the quick diagnosis of a broad range of infectious diseases and other applications such as food and environmental analyses.

How a Clinical Support Area Can Help Optimize Quality and Patient Safety

Katherine Franz, MT(ASCP), Deborah Blecker-Shelly, MS, MLS(ASCP)^{CM}SM, The Children's Hospital of Philadelphia, Philadelphia, PA

In conjunction with The Children's Hospital of Philadelphia's (CHOP) goal to become the safest, quality pediatric institution, the microbiology laboratory developed a comprehensive program, easy for non-patient care areas to sustain. Program elements include training for all staff, 5:1 feedback, daily patient safety rounds, bi-weekly topical discussions, anxiety management, team-based problem solving, published error rates, a progress dashboard, continuing education, tools for quality investigation, and the introduction of a "Safety Coach" to reinforce safety behaviors and tools. In the 3 ½ years since the program was initiated, fluctuating error rates have triggered immediate quality process investigations when rates went up. For example, an increase in positive blood culture gram stain errors was noted, quickly investigated, and found to be due to the staining traits of a new blood culture medium. A rapid cycle improvement process was initiated for this issue and error rates decreased. The primary outcomes of the program include: timeliness of identifying process and system problems, non-punitive approach to errors, enhanced teamwork, and improved staff problem solving skills. To conclude, a strong foundation of quality systems, education and process improvement was implemented to improve outcome and reduce safety events, creating an environment where error identification is not only expected but is viewed an opportunity for improvement.

How to Best Identify Carbapenem Resistant Enterobacteriaceae, a Modified Systematic Review

Aaron Grother, BS, Barbara Kraj, MS, MLS(ASCP)^{CM} Peter Shipman, MLIS, Georgia Regents University, Augusta, GA

Carbapenem-resistant Enterobacteriaceae (CRE) are pan-resistant Gram negative bacteria causing infections with up to 50% mortality rate. The best defense against these highly infectious microorganisms is isolation of patients upon early identification of the pathogens using culture, molecular and mass-spectrometry

technologies. The purpose of this project was to systematically review literature using modified A6 method to find the best technology to identify CRE considering the factors of sensitivity, specificity, turnaround time and cost. These and other relevant terms were used as keywords in systematic search of PubMed database upon advice from licensed librarian. The A6 method follows the CDC Laboratory Medicine Best Practices guidelines for reviewing published evidence of practices associated with improved quality outcomes. The A6 review process consists of six steps: Ask, Acquire, Appraise, Analyze, Apply, and Assess. After specifying the question, the acquisition of 28 relevant articles from PubMed was followed by appraisal by the Principal Investigator who assigned the articles defined scores from 0 to 10, and (upon exclusion of articles scored below 5) randomly distributed 7 of the 23 articles to an expert panel of 7 academic and clinical faculty for further appraisal. The scores from each reviewer were summed and assigned an effect size and a Strength rating of High, Moderate, Suggestive, and Insufficient, per the A6 method. Eight articles were given a Strength rating of High. This project was presented amongst students and faculty at Georgia Regents University. The assessment of evidence was beyond the scope of this project.

Biological Variation of Serum Fructosamine in Healthy Subjects

William J. Korzun, PhD, MT(ASCP), Virginia Commonwealth University, Richmond, VA

The purpose of this study is to determine the within-person biological variability of serum fructosamine in healthy individuals. While the measurement of Hemoglobin A1c (HgbA1c) has been universally accepted as a marker of glycemic control for many years, the validity of the test is questionable in patients with disorders that alter red blood cell survival. Furthermore, patients diagnosed with gestational diabetes cannot afford to wait 2-3 months to find out if the therapeutic interventions to lower their average blood glucose concentration are effective or not. Serum fructosamine provides a marker of average blood glucose concentration over a time interval of 2-3 weeks that is independent of red blood cell survival time. For this test to be adopted in routine clinical practice, the expected between-sample variation in fructosamine

within an individual must be known. Twenty healthy individuals were recruited, with approval from VCU's IRB, to have their serum fructosamine, total protein, and albumin measured every other week, over a total of 20 weeks. As of April 1, 2014, after 12 weeks, 2 subjects have withdrawn from the study. For the remaining 18 subjects, the average C.V. for serum fructosamine = 2.4% (range 0.9-4.0%). The average C.V. for serum fructosamine/albumin ratio = 1.8% (range 1.0-2.7%). Preliminary results suggest that a significant amount of the variability in serum fructosamine within an individual may be due to fluctuations in serum albumin concentration.

Note: This study is supported by a Member Grant from the ASCLS Education and Research Fund, and by CTSA #UL1TR000058 from NIH.

Promoting Evidence-based Approaches to Design Quality Improvement Projects

Diana Mass, MA, Battelle Centers for Public Health Research and Evaluation, Atlanta, GA

The CDC Laboratory Medicine Best Practices Initiative (LMBP™) is a systematic, multidisciplinary approach to identify, evaluate, and recommend evidence-based laboratory medicine best practices. The LMBP™ Initiative engages laboratory professionals, physicians, nurses, scientists, researchers, and other representatives of the health care system for their expertise and input. Evidence-based practice can demonstrate improvements in patient outcomes by determining what works, for whom and in what setting(s). The focus of this presentation is to describe the six steps of the LMBP™ A-6 cycle (Ask, Acquire, Appraise, Analyze, Apply, Audit/Assess) method and its application to evidence-based approaches in the design of quality improvement projects. An example of best practices, in reducing blood culture contamination rates, will be presented to demonstrate how the A-6 cycle method functions in determining an evidence-based recommendation. In addition, two CDC e-learning modules will be promoted that provide laboratory professionals the opportunity to learn how to perform evidence-based quality improvement projects.

Measuring Dabigatran with the Dilute Russell Viper Venom Confirm Assay

David L. McGlasson, MS, MLS(ASCP)^{CM}, 59th Clinical Research Division, JBSA Lackland, TX, George A. Fritsma, MS, MLS(ASCP)^{CM}, The Fritsma Factor, Your Interactive Hemostasis Resource, Birmingham, AL

There are no US FDA cleared tests to measure dabigatran, a direct oral anticoagulant. We compared the Stago Sta-Clot DRVV Confirm (DRVVC) which is FDA cleared for lupus anticoagulant testing, to the Biophen Hemoclot Thrombin Inhibitor (HTI) quantitative assay that measures dabigatran. The HTI is not FDA cleared. We enrolled anticoagulation clinic subjects with creatinine clearances (CCR) >30 mL/minute who were taking 150 mg dabigatran twice daily (BID) for at least one month. Subjects were not excluded for other medications or health issues. Monthly 3.2% citrate specimens were collected from 64 males and 38 females (average age 76.5) for 6 months yielding 418 data points. We did not correlate collection time with medication time. We established reference intervals (RI) on 44 normal subjects not on dabigatran. Specimens were centrifuged immediately, aliquotted, and stored at -70°C. Specimens were rapidly thawed and mixed immediately before performing an HTI and a DRVVC using a Stago Evolution coagulometer. The DRVVC RI was 35.9–42.4 seconds (mean 34.7 ±2SD). Normal HTI concentrations were zero. Test sample DRVVC range was 42.2–193.9 seconds, mean 97.6; test sample HTI range was 0.0–770 ng/mL, mean 184.1. DRVVC to HTI regression was $R = 0.86$. DRVVC failed linearity at HTI levels below 30 and above 550 ng/mL. The DRVVC could be employed to measure dabigatran within the range of 30–550 ng/mL. When bleeding from trauma occurs it may be important to know the amount of dabigatran present.

When Lab Professionals Talk Face-to-Face with ED Nurses

Mary Beth Miele, PhD, MLS(ASCP)^{CM}, Penn State Hershey Medical Center, Hershey, PA

To ensure patient safety and optimal patient care laboratory professionals and nurses must communicate effectively. However, opportunities for laboratorians and nurses to talk face-to-face are limited. Five years ago our laboratory manager initiated a Lab Liaison program. Nursing units were contacted and asked if they were

interested in having a Lab Liaison team come to their weekly staff or monthly Nurse Practice Council meetings. One area where tension was high was the ED, so an ED lab liaison team was formed. Lab members included a point-of-care coordinator, a microbiology technologist and the education coordinator. The team has attended over 25 meetings and during that time complaints from the ED staff have decreased as a result of implementing simple solutions, such as dedicating a printer to ED requests and having those requests print out on pink paper to alert laboratory staff of specimens coming from the ED. Having 3 specific people as points of contact rather than calling “the lab” has decreased frustration levels and time to resolution of problems. Information about laboratory protocols, test menu changes, specimen labeling error rates, IV-contaminated specimens, and turnaround time has been shared. Education of nursing staff has increased understanding and cooperation between these two groups of the health care workers. A task force of lab and ED nursing personnel has already been formed and a rapid improvement event successfully implemented. In summary, getting out of the laboratory and communicating directly with our ED team mates has enhanced laboratory services and patient care.

Clinical Reasoning: A Cooperative Learning Activity to Promote Critical Thinking in Medical Laboratory Science Students

LaDonna Moreland-Pearson, MS, MLS(ASCP)^{CM}, Rush University, Chicago, IL

An educational learning activity was created to promote critical thinking skills in Medical Laboratory Science students. The need for this activity came about in response to a student course evaluation. Educators in the field of Medical Laboratory Science should instruct in a manner that allows the student to develop skills in evaluation, critical thinking, decision-making and problem solving to someday perform at the mastery and application level demanded by the profession. The activity is “cooperative” because it combines team-based learning with problem-based learning the case study as an educational tool. The learning activity involved splitting the students into groups and then they are given the same case study and question set. The group is given time to discuss the case and answer the questions. The students choose the correct answer by punching

out the answer choice on a card. This makes their decision permanent, forcing them to commit. After the small group session, the groups come together for a large group answer session. Each group must hold up their letter choice at the same time to avoid following along with the majority if their answer differs. The instructor confirms the correct answer, hears appeals and provides additional information. The activity was recorded and evaluated resulting in the emergence of specific themes. These themes included status, evidence of prior science knowledge, meaning making, the use of scientific language and Socratic questioning. The emergence of these themes indicates that critical thinking has taken place as a result of participation in the activity.

Comparison of a Novel Venipuncture System Versus a Standard System for Hemolysis Reduction

Shemeka Brownlee, Erin Everett, Michael Lu, **Lester Pretlow, PhD, C(ASCP)^{CM}, NRCC(CC)**, Georgia Regents University, Augusta, GA

The purpose of this study was to document the occurrence of hemolysis using the S-Monovette® collection tube system (Sarstedt, Inc., Newton, NC) compared to a standard vacuum tube when used to draw blood specimens from IV-lines. Our hypothesis stated that there would be a significant difference in hemoglobin and measured analyte levels (K, CK, LD) between the two types of tubes. In the MICU (medical intensive care unit) at Georgia Regents Health System, nurses collected a standard lithium heparin vacuum tube and the S-Monovette® lithium heparin tube from consented patients with arterial-lines. The order of collection was randomized using computer software. Both specimens were sent to the hospital's clinical lab and aliquotted into two specimen containers. The first container was analyzed in the hospital's clinical lab and assessed for hemolysis indicators (K, CK, and LD). The second container was analyzed in the Translational Research Laboratory using spectrophotometry for the measurement of free hemoglobin (mg/dL). The occurrence of hemolysis between the two systems was analyzed using chi-square statistic. The mean values of hemolysis indicators were compared using independent t-tests. Preliminary data shows that the S-Monovette® consistently causes less hemolysis than the standard vacuum tube, however, the difference (thus far) is not

statistically significant. Thus far, hemolysis sensitive analytes show no statistically significant difference between the two tubes. However, LD does show consistent differences in enzyme activity between the two tubes. This study is ongoing and will be completed in spring 2015 once 200 collections have been obtained.

Acute Myocardial Infarction Risks for African American and European American Women

Tina Vang, Ryan J Knowles, Richard J Dixon, **Lester Pretlow, PhD, C(ASCP)^{CM}, NRCC(CC)**, Georgia Regents University, Augusta, GA

The Centers for Disease Control (2012) stated that approximately 600,000 people die every year from heart disease in the United States. The purposes of this study were to characterize a population of African American and European American women in the Central Savannah River Area (CSRA) who have had an acute myocardial infarction (AMI), and to determine the association of risk factors between these two populations. The study population consisted of 194 African American and 176 European American women between the ages of 20 and 100 who had suffered an AMI and reported to Georgia Regents Medical Center. We retrospectively reviewed medical records and retained data on patients' diagnoses and laboratory values such as hypertension, cholesterol, diabetes, troponin, obesity, and depression. The data was analyzed using logistic regression to determine the association between risk factors and the two patient groups. Hypertension diagnosis ($p=0.0004$), diabetes diagnosis ($p=0.0048$), and body mass index ($p=0.0059$) showed a statistically significant difference between the two groups. Hyperlipidemia diagnosis, cholesterol readings, troponin values, EKG results, presence or absence of depression, and previous health care contact were all found to not have a significant difference. The mean values for weight ($p=0.0195$), BMI ($p=0.0338$), and age ($p=0.0089$) all had statistically significant differences. Although the groups shared the same top five abnormal risks (BMI >25 , abnormal EKG, hypertension, obesity, diabetes), some values observed in the European American group were significantly less. The study suggests that African American women in the CSRA have an increased risk for AMI over European American Women.

Flipped Classroom: Implications in the Student Laboratory

Amanda Reed, Ed.M., MLS (ASCP)^{CM}, Donna Duberg, M.A., M.S., MT (ASCP) SM, Mona Hebert, B.S., MLS (ASCP)^{CM}, Saint Louis University, St. Louis, MO

Student disengagement during lecture and unpreparedness for laboratory motivated us to implement a flipped classroom model of instruction. This transformed our classroom from a teacher-centered, passive learning environment to a student-centered, active learning environment. Traditional lectures were replaced with online presentations utilizing lecture-capture software. These lectures introduced basic concepts and laboratory procedures within these clinical laboratory science areas: chemistry, immunohematology, phlebotomy, safety, and urinalysis. During class students were placed into groups and utilized information presented in the online lectures to complete case studies and problem solving assignments. Traditional modelings of procedures during laboratory were replaced with pre-laboratory instructional videos. Students were required to view these prior to attending the associated laboratory and then completed a laboratory exercise reflecting objectives stated in the online lecture and video. Statistically, there was weak to moderate positive correlation between percent of online lecture watched and laboratory or quiz performance, but not both. This spotty association indicates a need to better align all course components. A comparison of student performance on laboratory activities using the traditional lecture model versus the flipped classroom model was performed using SAS 9.3 and a Pooled or Satterthwaite independent samples T-test showed no statistical improvement. In fact, student scores on one laboratory activity significantly decreased. A student survey indicated the majority of students liked the flipped classroom model and perceived it to be useful. We plan to continue using the flipped classroom model however refinement and standardization of all components is needed to clarify student expectations and reduce student confusion.

Assessment of Outcomes of Cinnamon Supplements on Hemoglobin A1c Levels in Non-Diabetic Adults

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Cinnamon has long been classified as a natural insulin sensitizer. Cinnamon often is used in attempts to lower blood sugar levels. Scientific studies, however, show conflicting results of its usefulness. This pilot study aimed to investigate the blood glucose lowering properties of cinnamon taken as a dietary supplement. To determine differences in blood glucose levels by groups, a total of 56 non-diabetic individuals completed this study. Members of the test group (24 individuals, ages 20 - 61 years) were given 2 grams of cinnamon in a supplement form to ingest daily with any meal; control group members (32 individuals, ages 20 - 62 years) received no cinnamon supplements. Hemoglobin A1c (HbA1c) levels were measured as an indication of blood glucose levels at the onset and again at the end of the 4-week study to assess changes due to cinnamon supplements. The measurements were made using DCA 2000 HbA1c analyzer. An independent t-test indicated no significant difference in HbA1c levels for the test group ($M = 5.15\%$, $SD = 0.24\%$) and the control group ($M = 5.17\%$, $SD = 0.23\%$), $t(54) = -0.41$, $p = 0.69$. A paired t-test found no significant differences from pretest to posttest for the test group, $t(23) = 2.06$, $p > .05$. Larger studies of longer duration which include additional variables such as blood cholesterol are indicated for the future for those who are pre-diabetic or diabetic.

Evidence Based Laboratory Practice: Analysis of Next Generation Sequencing Methods for Detection of EGFR and KRAS Mutations in Non-Small Cell Lung Cancer Patients for Targeted Therapy

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Genetic mutations in Non-Small Cell Lung Cancer (NSCLC) are associated with tumor growth and resistance to targeted therapy with a prognostic impact on lung cancer patients. Current diagnostic gold standard methods in use are Sanger Sequencing, Real-Time PCR, and High Resolution Melt Analysis. These techniques require large volumes of purified DNA and extensive time to perform mutation analyses. Next Generation Sequencing (NGS) platforms are a precise improvement in methodology utilizing small tumor

DNA volumes and high cell heterogeneity. NGS platforms can be implemented in the clinical setting, promoting utility and efficiency. Our systematic review with meta-analysis evaluated the diagnostic validity of NGS platforms in detection of EGFR and KRAS mutations in NSCLC. With an extensive literature analysis and appropriate inclusion criteria, nine studies out of 21 were analyzed using bivariate random models and statistical meta-analysis. STARD criteria were used to assess study quality. The pooled specificity and sensitivity were 93% and 97% respectively with insignificant heterogeneity across studies. The positive likelihood ratio (PLR) was 10.6 and the negative likelihood ratio (NLR) was 0.02 indicating robust discrimination for true positive and true negative results. The meta-analysis demonstrated a diagnostic odds ratio (DOR) of 582 indicating higher discriminatory test performance. The NLR, PLR, and DOR were statistically significant ($P < 0.001$) for KRAS and EGFR diagnosis. These platforms can evaluate multiple genes concurrently to advance the timely targeted therapies. Our systematic review demonstrates the process for performing a meta-analysis for novice clinical laboratorians to evaluate new diagnostic methods for evidence-based laboratory practice.

Oral Presentation Abstracts

Retaining Experts: What's Important to Staff?

Susan J. Beck, PhD, Tara C. Moon, MS, Rebecca J. Laudicina, PhD, The University of North Carolina at Chapel Hill, Chapel Hill, NC

The need for laboratory services is likely to increase over the next decade due to an aging population and an increase in newly insured Americans. At this critical time, the persistent shortage of clinical laboratory personnel threatens to limit access to health care. One approach to address the shortage is to optimize retention of senior, experienced staff in the workforce. An online survey to assess the retirement plans of clinical laboratory professionals (CLP), personal factors that influence those plans, and key incentives for fostering retention, was distributed to members of the American Society for Clinical Laboratory Science (ASCLS) in May, 2012. The majority of respondents (65%) between 50 – 62 years indicated that there was a greater than 50% chance they would be working after

age 62. Only 15.8% of the respondents thought that there was a greater than 50% chance that they would be working full time after they retired from their current job. The retirement option selected most often by respondents was part time work. Benefits, compensation, and opportunity for part-time work were key retention incentives identified by CLP in all job function groups (practitioners, managers, and educators). Career stage was shown to play a significant role in CLP's importance ratings of specific retirement incentives, suggesting that age differences exist in workplace factors and personal motivators for continuing to work. Results of the study may guide laboratory administrators when advocating for workplace changes important to retaining staff of all ages and job function.

Developing Interprofessional Guides to Laboratory Testing for Student Healthcare Providers

Krystal L. Davis, B.S., Amanda M. Stastny, B.S., Ulrike Otten, MT(ASCP)SC, University of Nebraska Medical Center, Omaha, NE

The University of Nebraska Medical Center's student-run free clinics, also known as the SHARING Clinics, operate within an interprofessional paradigm. These clinics are fortunate to have several on-site, point-of-care, waived laboratory testing options in addition to sending out tests. The presence of on-site laboratory services has proven to be beneficial both in issues of convenience and quality. Specimen collection and handling by clinical laboratory science (CLS) students reduces the occurrence of pre-analytical error in testing processes. After collaborating with members of the SHARING student advisory committee from multiple professions, it was determined that reference guides to laboratory testing would be useful tools at the SHARING Clinics. A survey was conducted, which confirmed the potential utility of laboratory guides due to the fact that the student providers volunteering at the clinics have little experience in clinical practice and limited knowledge of laboratory test ordering and interpretation. The reference guides will aid the student healthcare providers in choosing the most appropriate, informative and cost effective laboratory tests for their patients. An initial reference guide to diabetic diagnostics and monitoring was created and has been approved for use at the clinics. This project documents

the process used in determining the nature of a present need and the endeavor to provide a useful tool to meet that need at the SHARING Clinics. The intention of the authors is that this project be continued by future CLS students as they create guides focused on topics such as sexually transmitted infections and overall health and wellness.

Retaining Experts: What Can Management Do?

Rebecca J. Laudicina, PhD, Tara C. Moon, MS, Susan J. Beck, PhD, The University of North Carolina at Chapel Hill, Chapel Hill, NC

An online survey of members of the American Society for Clinical Laboratory Science (ASCLS) in May 2012 examined laboratory administrators' views on potential for workplace changes to facilitate staff retention and how they perceive older clinical laboratory professionals (CLP). Results indicated that employee retention strategies currently in place are not concordant with the ones CLP believe are important. Furthermore, five of the retention incentives rated as most important by practitioners (see previous abstract) were rated as low feasibility by administrators. For example, benefits, compensation, and opportunity for part-time employment are rated as important for retaining CLP past the time of retirement eligibility, but rated low in feasibility by administrators. With the exception of enhancing ergonomic equipment, administrators reported that workplace changes favored by practitioners are unfeasible. While administrators in all age groups attributed positive traits to older CLP, older administrators held more favorable views. Administrators perceived older CLP as productive, reliable, loyal, and having a high level of technical skills. The combination of work ethic and technical competence should make retention of older, experienced CLP attractive to laboratory administrators and advantageous for combatting workforce shortages. Results of this study should guide strategic efforts to retain CLP in the workforce.

Hypothesis: Impacting Neuroblastoma (NB) Mitochondrial Reactive Oxygen Species (ROS) With A Palladium/Lipoic Acid Complex (PdLAC) Non-Toxic Integrative Nutritional Therapy Option Monitored with Clinical Chemistries, and Imaging When Traditional Therapies are Exhausted

Edward J. Neren, Biomedical Consultant Suffern, NY

Neuroblastoma (NB) is the most common children's extracranial solid tumor (accounts for approximately 15% of all pediatric cancer-related deaths). Few options exist when traditional therapies are exhausted. Adult Stage IV (18 types) outcome studies (J.W. Forsythe, MD) established the PdLAC as non-toxic and efficacy (500/patients-40 months 59% survival rate 2010-2013). The objective is to provide a hypothesis and cell line study data supporting adaptation of the adult Stage IV integrative nutritional therapy PdLAC option for NB patients having exhausted traditional therapies. A PdLAC SH-SY5 cell line study was performed (53% reduction cell growth in 48 hours) which coincides with adult cell line studies (Glioblastoma--60.6%, Adenocarcinoma--69.3%, etc.), indicating shared cancer cell mitochondrial ROS chemistry. The PdLAC (adult dose 4-teaspoons 3-times/day, 1-teaspoon/30 pounds of body weight) could be adjusted to the NB patient and progress monitored with clinical chemistries, tumor markers, and imaging. PdLAC enters both cancer/normal cells and the mitochondrial outer membrane by the voltage dependent anion channel, then through the inner membrane by the Complex 1. Normal cells: PdLAC donates electrons to the oxidative phosphorylation channel (OXPHS) producing more ATP. Cancer cell damaged OXPHS: electrons are redirected producing excessive ROS that builds up between the inner and outer membranes. When the outer membrane ruptures, ROS, Cytochrome C, Procaspases 2, 3, and 9 enter the anaerobic cancer cell cytoplasm and apoptosis occurs. The neuroblastoma cell line study and positive adult PdLAC clinical outcome data justifies development of a new therapy option for neuroblastoma patients that have exhausted traditional therapies.

Emotional Intelligence in Medical Laboratory Science

Travis M. Price, PhD, MT(ASCP), Weber State University, Ogden, UT

The purpose of this study was to explore the role of emotional intelligence (EI) in medical laboratory science, as perceived by laboratory administrators. To collect and evaluate these perceptions, a survey was developed and distributed to over 1,400 medical

laboratory administrators throughout the U.S. during January and February of 2013. In addition to demographic-based questions, the survey contained a list of 16 items, three skills traditionally considered important for successful work in the medical laboratory (technical skills, theoretical knowledge, and mechanical skills) as well as 13 EI-related items. Laboratory administrators were asked to rate each item for its importance for job performance, their satisfaction with the item's demonstration among currently working medical laboratory scientists (MLS) and the amount of responsibility college-based medical laboratory science programs should assume for the development of each skill or attribute. Participants were also asked about EI training in their laboratories and were given the

opportunity to express any thoughts or opinions about EI as it related to medical laboratory science. This study revealed that each EI item, as well as each of the three other items, was considered to be very or extremely important for successful job performance. Administrators conveyed that they were satisfied overall, but indicated room for improvement in all areas, especially those related to EI. Those surveyed emphasized that medical laboratory science programs should continue to carry the bulk of the responsibility for the development of technical skills and theoretical knowledge and expressed support for increased attention to EI concepts at the individual, laboratory, and program levels.

The peer-reviewed Clinical Practice Section seeks to publish case studies, reports, and articles that are immediately useful, are of a practical nature, or contain information that could lead to improvement in the quality of the clinical laboratory's contribution to patient care, including brief reviews of books, computer programs, audiovisual materials, or other materials of interest to readers. Direct all inquiries to Perry Scanlan, PhD, MT(ASCP), Medical Technology, Austin Peay State University, Room D212, Sundquist Science Complex, Box 4668, Clarksville TN 37044. Clinical Laboratory Science encourages readers to respond with thoughts, questions, or comments regarding these articles. Email responses to westminsterpublishers@comcast.net. In the subject line, please type the journal issue and lead author such as "CLIN LAB SCI 27(3) RE ABSTRACTS". Selected responses may appear in the Dialogue and Discussion section in a future issue. Responses may be edited for length and clarity. We look forward to hearing from you.
