

ASCLS-IL Insights

Letter from the President

Dear ASCLS-IL,

First off, I want to thank everyone out in the field who has been working so hard to staff our labs in these trying times. This new variant continues to push all of healthcare to its limits and I know the labs out there are feeling stretched thin. This is NOT an easy time for those in our profession who are now being asked to cover for their colleagues who are out with COVID among increasingly short staffing levels. I wish I could say we were through the worst of it but we continue to see rising rates, with hospitalizations and death rates likely to follow. It is more important than ever to have an organization like ASCLS to make our voices heard and address the continuing issues we are all seeing on a daily basis. We are here to support you.

Unfortunately, I must announce that again this year we will not be holding a state meeting. This hurts me personally as I think of all the missed connections and education opportunities our state meeting provides for students, educators, and professionals. In its place I hope to hold a series of virtual educational events, such as the professional panel discussion we held last year.

On February 3rd, I will be hosting an Open Forum for any interested members to discuss the future of ASCLS-IL in place of a board meeting. This change is due to the deficiency we have on our board, with a majority of the spots being open, and intend to be a start for planning for the future of our organization and how it needs to change to adjust to the needs of our profession.

At the national level of ASCLS, we have seen some successes. First, the legislative days this year was rescheduled to the fall, and was able to hold a hybrid model with 73 ASCLS members attending in person and 46 attending virtually. Some topics covered were the VALID act and discussions on supply chain. On January 16, 2022, ASCLS held its Mid-Year House of Delegates where Kyle Riding, the national treasurer, gave an inspiring talk on reimagining the ASCLS to appeal to professionals in the modern climate. Another great accomplishment that came out of the HOD, was a position paper laying out a great description of the levels of the profession and the defining accomplishments that define those levels. I highly recommend reading the document and bringing it back to your institutions to help define career progression and succession planning in our labs; some of the biggest complaints I have heard from professionals in the field.

Once again before I close out my letter for this issue of *ASCLS-IL Insights*, I want to mention all the great opportunities to participate in our organization. The pandemic has had a profound effect on us all, and ASCLS-IL is no exception. It is still my mission to get the engine running. ASCLS-IL is so important to our community of Medical Laboratory Scientists and our state meeting provides so much potential for learning and networking for Illinois students, professionals, educators, and vendors. I am so excited to see this event return. Please reach out if you are ready to help us get there.

Thank you for all you do and let's look forward to a great 2022.

Sincerely,

Nicholas R. Steder III

MBA, MS, MLS(ASCP)^{CM}, DLM(ASCP)^{CM}

ASCLS-IL President



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Special points of interest

- Save the Dates
- Board of Directors
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- Case Study
- Lab Humor





Save the Dates 2022

CLEC 2022

- ♦ March 14th– 16th
 - ♦ Denver, CO
- Virtual and In-person

Joint Annual Meeting 2022

- ♦ June 26th-30th
- ♦ Grand Rapids, MI



"The new year stands before us, like a chapter in a book, waiting to be written." — Melody Beattie

Happy New Year!



Photo submitted by Wendy Norton



2021-2022 ASCLS-IL Board of Directors

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2021-2022 Developing Professional Forum

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Trying Something New

By: Kim Alexis Espejo, MLS(ASCP)^{CM}, Editor

Hello fellow laboratorians! I hope the holiday season has brought you some much needed rest and fun. As editor, I just wanted to pop-in and update you all on something new I would like to try for the newsletters going forward. I would like the newsletter to continue on with sharing articles, case studies, pictures, summaries, and updates for ASCLS-IL, but I would also like to make things more fun for readers (especially during these tough times). If there are any artistic and funny members willing to submit memes, jokes, comics, etc. relating to the laboratory profession, I would like to share it in the newsletter. An example can be found on the margin of page 8. I would also like to have a section for interactive activities. I was thinking some tongue twisters, puzzles, or some sort of activity relating to the profession. An example can be found on the bottom of page 16. I'm doing this in hopes to add some fun to the articles and would love feedback or submissions for the future. Thank you and enjoy the Winter 2022 Edition.



How Did I Get Here?

By: Amandailee Adams, MS, M(ASCP)^{CM}, MLS(ASCP)^{CM}

My route into a medical laboratory science, and eventually MLS education in higher education, was full of twists and turns. I have always had a passion to teach and identified as a young person a LOVE for learning. As an elementary-aged student, I remember declaring I wanted to be a teacher. As I continued in my educational career, I realized I had a strong affinity for science and LOVED the beautiful wonder of science. In high school, I felt drawn to healthcare. I KNEW I wanted to HELP others and aspired to go to medical school as I thought being a physician was the only way to achieve that goal. After 4 years of undergraduate studies, I was exhausted at the rigor of a biology program and opted to apply to graduate school (instead of medical school) and was VERY fortunate to be simultaneously be employed in a hospital laboratory where I would be trained as a clinical microbiologist while working on my master's degree. After completing clinical training, I earned my categorical ASCP certification in microbiology and would go on to earn my master's degree. As a clinical microbiologist, I had the absolute JOY of teaching MLS students at the bench. Looking back at my early bench career, teaching students brought me the greatest joy and fulfillment. The local university was in need of a clinical microbiologist to teach as an adjunct and my educational and clinical experience allowed me to fill that role. This "leap of faith" would go on to change the course of my career and perfectly marry my love for learning and teaching with my love for laboratory work and clinical microbiology into a fulfilling and exciting career in higher education. I would then go on to earn an additional bachelor's degree in MLS and accept a job as a full time Assistant Professor with the ability to teach all courses in the MLS curriculum.

Because of my interesting route into the MLS field and higher education, I have unique perspective that I try to share with students trying to find their way in the world and trying to make decisions about their future. My personal advice to new graduates regarding future plans is:

Be flexible: Do not become rigid in your ability to adapt to your work environment and identify areas for advancement. Adapt and overcome.

Be fearless: Go for it if it fits your personal definition of happiness! Do not be paralyzed by fear.

Listen: Listen to yourself, your inner voice and those trusted individuals around you.

Follow the path: Listen to your inner voice about your daily interactions and identify what brings you joy. A path will emerge for you to follow.

Never stop learning: Do not become stagnant in your approach to making yourself a better (MLS) professional and person. Find a growth mindset and stay there! Continuous improvement!

Have confidence: You have endured a rigorous MLS program and triumphed! Do not question your ability to succeed and overcome adversity!

Be a problem solver (not a problem maker): Identify areas that need improvement in your current work environment and GO FOR IT!

Be a leader: Always be the colleague that does the right thing under every circumstance and be the positive example to those around you.

Be patient: Experience and wisdom come in time. It takes time for confusing events to make sense and reveal the meaning.

Enjoy EVERY day: Enjoy the good days, the mediocre days AND bad days as they all serve a purpose in character development. Each day is a gift of TIME to impact the world.

I am beyond blessed with a gratifying 22 year career of helping patients in a clinical setting and now a 10 year career of guiding future professionals in higher education. It has been an interesting path filled with twists and turns, highs and lows, uncertainty and confidence, clarity and confusion but always with a PURPOSE. To new graduates, go find YOUR PURPOSE. Most of all though, enjoy the journey on your way to the destination of finding YOUR PURPOSE!

NIU Students Excel in Cell Competition

By: Jane Donahue, Director of Marketing and Communications
College of Health and Human Sciences

It wasn't just fun and games when a team of NIU Medical Laboratory Sciences (MLS) students battled others from around the country in the first-ever National Cell Bowl sponsored by The American Society for Clinical Pathology (ASCP).

MLS students Samantha Ortiz, Elaina Kinney, Brooke Gainer, Kieran Van Vliet, Yesenia Garcia Rivera, Josh Naser, Rebekah Gonzalez, Presli Lovell, Jasmine Parra and Soyoung Park put their skills to the test during the National Cell Bowl of hematology students, a month-long event designed to help students hone their skills while preparing for the ASCP Board of Certification exams.

"Ample evidence shows student engagement is essential for learning," said Rouzbeh Chegeni, assistant professor of Medical Laboratory Sciences, NIU School of Health Studies. "Gamification of learning is one way to increase student engagement, and the National Cell Bowl created an opportunity for MLS students to do so."

The Cell Bowl uses a free study tool where students take weekly quizzes and then the team's faculty submits their team's best score. Chegeni said aside from making learning fun, tournaments like this promote a sense of community and enhance collaboration skills.

"I am very thankful to our students who participated in this event and grateful to colleagues in the MLS program, school of Health Studies and the College of Health and Human Sciences who encourage such activities," Chegeni said.

NIU students' four-week score landed them in ninth place out of 30 teams in the Midwest.



Masih Shokrani Receives Prestigious Award

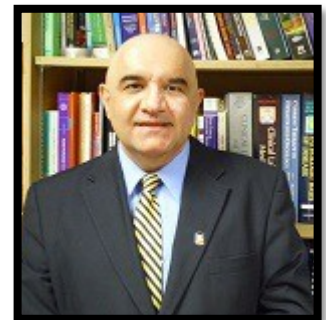
By: Jane Donahue, Director of Marketing and Communications
College of Health and Human Sciences

Masih Shokrani, professor of Medical Laboratory Sciences (MLS) in NIU's School of Health Studies, is the recipient of 2020-2021 American Society for Clinical Laboratory Science (ASCLS) Scientific Assembly Professional Achievement Award.

"It is so rewarding to be recognized by the ASCLS Scientific Assembly for one's work in the chemistry/urinalysis discipline," Shokrani said.

Professor Shokrani teaches medical immunology and medical diagnostic biochemistry, and is an advisor and dissertation committee chair to several students in the doctoral Health Sciences program in the College of Health and Human Sciences.

The award ceremony took place June 29 during the ASCLS Annual Meeting which was held in Louisville, Kentucky.



Educating During the Pandemic

By: Andrea L. Jensen, MPH, MLS(ASCP)^{CM}

Becoming a Medical Laboratory Science (MLS) educator was one of my best career decisions. Of course, the transition from clinical to academic MLS was not without its challenges – the most profound to date being the ongoing global COVID-19 pandemic. Early in 2020, the pandemic compelled me to abruptly switch to remote instruction, develop robust online content for multiple courses, and supplement face-to-face activities with remote alternatives. Nearly two grueling years later, the ongoing pandemic continues to impact higher education. As I write this, I realize that I now have more experience as a pandemic educator than as a pre-pandemic educator. It is, therefore, not surprising that the pandemic has irrevocably transformed much of my teaching philosophy and practice – helping me become a more flexible and empathetic educator, helping me embrace online learning environments, and helping me support students as they experience burnout.

Offering Reasonable Flexibility

Educating during the pandemic pushed me to become more flexible and empathetic in my day-to-day practice. The pandemic exacerbated many social issues known to negatively affect learning – digital poverty, housing insecurity, health disparities, imbalance between life responsibilities and coursework, job insecurity, and the overwhelming uncertainty associated with a public health emergency.^{1,2}

Understandably, such stressors reduced students' available margin for learning and required that I adjust my course expectations while ensuring MLS competencies could still be met. The complicated and ever-changing pandemic environment called for reasonably flexible course deadlines.^{1,3}

I considered the impact of the pandemic on my students' lives, beyond their academic experiences, and how it affected their ability to meet unnecessarily rigid course deadlines. I reflected on my own experiences with situational conflicts between life responsibilities and academic expectations and knew that my students were probably having similar experiences. So, I began offering grace periods for students who needed to defer an assignment deadline for whatever reason – all they had to do was notify me ahead of time and propose a new deadline. Many students took advantage of the grace period policy and were, therefore, empowered to negotiate personal conflicts which may have otherwise prevented them from meeting course competencies.

Embracing Online Learning Environments

Acclimating to online MLS learning environments was a challenge for learners and a time-consuming process for me. The sudden transition to online instruction in the early-pandemic triggered learning-related changes which caused students to perceive remote instruction as less effective than face-to-face instruction.⁴ Although, this probably had more to do with the abruptness of the transition, rather than online learning's true potential for efficacy. Thoughtfully designed, well-organized online courses in which the instructor provides frequent, timely feedback can facilitate learning experiences that are just as effective as those in face-to-face environments.^{1,3} Online learning also offers more flexibility for learners – that is, as long as they can access course materials and instruction in an asynchronous, rather than solely synchronous, format.⁴

To ensure good online learning experiences for my students, I spent considerable time developing and constructing my online courses, ensuring that they were easy for students to navigate. I included materials and activities that allowed students to engage with course topics from multiple perspectives – for example, watching lecture videos, completing no-stakes checkpoint quizzes, solving case studies, and reflecting on and remediating their learning. Then, I provided frequent, timely, formative feedback to each assignment.

As I modified my courses, I did so with the intent to continue offering online and/or hybrid options for both MLS and non-MLS students in the future. Rather than hastily designing temporary online courses, I viewed the conversion to online learning as a proactive strategy to increase flexibility for students and to attract more non-MLS students. In 2021, I continued offering courses in online and hybrid formats and, this past semester, greater than 70% of students enrolled in my online Immunology course were non-MLS students.

Overcoming Burnout

As the pandemic drags on, burnout has become an unfortunately undeniable part of both the academic and professional MLS existence. Personal and social crises affect students' capabilities to function academically and acute and/or chronic change, as experienced in a global pandemic, spurs stress and burnout.⁴ Beyond the academic environment, MLS students observe burnout in the professional environment as they engage with stressed MLS practitioners while completing clinical rotations. A pre-pandemic analysis of burnout amongst laboratory professionals, alarmingly, revealed that greater than 85% were experiencing burnout due to high workload and understaffing.⁵ Anecdotally, burnout amongst mid-pandemic laboratory professionals has continued to escalate with added COVID-related work burden and reduced staffing. Helping students build the skills to traverse burnout may help them in both their academic and professional careers. Educators can help students identify signs of burnout and act to reduce stressors by guiding them to set goals, structure their work, reduce commitments, and allow for adequate cognitive breaks.⁴

I saw symptoms of burnout appearing in my students – most notably amotivation, irritability, cynicism, and detachment. To help them identify and navigate their burnout, I increased opportunities for students to reflect on their workload, set goals, and develop study plans. Reflections allowed students to recognize when they were overcommitted and empowered them to adjust accordingly. Whenever possible, I embedded breaks in my course schedules and frequently encouraged students to allow themselves adequate space to schedule cognitive breaks on their own. I hope the skills they developed in my courses will continue to help them recognize and counteract burnout in their professional lives.

In Summary

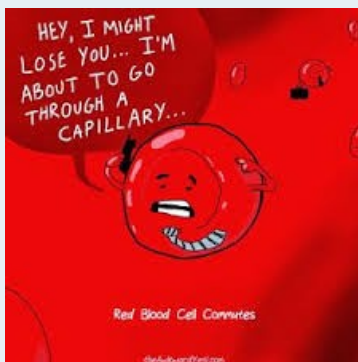
The pandemic significantly influenced my practice and philosophy as an educator – I believe for the better. I have become more flexible and empathetic toward my students. I have learned to embrace the online learning environment. I have begun to engage students in addressing academic and professional burnout. As the pandemic persists, I imagine that it will continue to strengthen my practice as an MLS educator.

“In 2021, I continued offering courses in online and hybrid formats and, this past semester, greater than 70% of students enrolled in my online Immunology course were non-MLS students.” — Andrea L. Jensen

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Lab Fun of the Season



Submit funny memes, comics, jokes, etc relating to the laboratory profession, and be featured in the next edition!

ASCLS-IL SCHOLARSHIPS

Ellen McGill Memorial Scholarship

This scholarship is named in honor of Ellen McGill who was a long-time medical technologist in the Chicago area. Ellen was an active member in ASCLS-IL (formerly ICLSA) and a past president. She was the Director of the School of Medical Technology at Illinois Masonic Hospital. This scholarship was started to honor Ellen's contributions to the profession.

This scholarship will be awarded to an active member of ASCLS-IL that has not previously attended Legislative Symposium or the ASCLS National Meeting to pay for expenses. Two scholarships of up to \$750 may be awarded annually. The registration fee and travel expenses will be reimbursed to each scholarship recipient after attending the meeting up to a total amount (registration and travel) of \$750. Receipts must be submitted to the ASCLS-IL Treasurer for reimbursement. Award recipients will be required to write an article for the ASCLS-IL newsletter summarizing their experience at Legislative Days or the National Meeting.

Upcoming deadline: Completed Application and materials for scholarships to the National Meeting must be received by **May 1st, 2022**.

ASCLS-IL Future Leaders Scholarship

Two scholarships of \$500 to attend the ASCLS-IL State Meeting or ASCLS National Meeting will be awarded each year. Candidates must be an active member of ASCLS-IL in their final year of an MLS/MLT Program or in their first year as a professional.

Upcoming deadline: Completed Application and materials for scholarships to the National Meeting must be received by **March 15th, 2022**.

For details on scholarships, including information on how to apply, visit <http://www.asclsil.com/Scholarships.html> or contact Michelle R. Campbell at m.campbell118266@yahoo.com

Northern Illinois University's Medical Laboratory Science Club at STEM Fest 2021

By: Dioco Dioel Reyes, Developing Professional Forum Chair

After a year-long hiatus, NIU's STEM Fest returned in person this past October. STEM Fest is a congregation of all things science, technology, engineering, and math related. STEM programs, STEM clubs, surrounding businesses, and educational institutions offered interactive exhibits, talks, and hands-on activities for all ages. Under new leadership and interest, this year's MLS Club took initiative and became one of the sixty booths set up at the event. The club provided insight on the growing MLS field and featured popular activities from previous years. Learn to Pipette, Learn to Streak, On the Scope: Sickle Cell Anemia, On the Scope: Acute Myeloid Leukemia, Pipette Coloring, and to Catch a Germ were all reintroduced activities and educational lessons. We laid out tubes filled with dyed water and had participants pipette mock enzymes into mock substrate to form a mock product, creating a color change! On the microscope we showed a peripheral blood smear of acute myeloid leukemia and sickle cell anemia and explained the pathophysiology of each disease. One activity that excited our creative participants was Pipette Coloring. Analogous to a coloring book, participants pipetted various colors of dyed water onto filter paper cutouts of ghosts, pumpkins, and bats. They got to keep their masterful creations as souvenirs! Finally, my most favorite activity: to Catch a Germ. We would toss a tennis ball coated with UV light reactive glow powder to expecting participants, and after a few catches, we would shine a UV light onto their hands, revealing speckles of glow powder residue; the speckles simulated the exchange of bacteria through the tennis ball. To clean these simulated bacteria, we provided participants with hand sanitizing wipes and showed them how to clean your hands properly, highlighting the cleaning of the dorsal hand, in between fingers, palms, fingertips, and thumbs. NIU's successful, full-fledged return of STEM Fest brought the DeKalb-Sycamore STEM community together once again. Alumni families and students from surrounding middle and high schools congregated that October to learn about the STEM field and everything it has to offer. And thank you to everyone in the MLS Club that helped make this event happen!



From Left-to-Right: Christopher Vosmik, Lindsey Semock, Nikolas Bereolos, Dioco Reyes, Mica Domingo, and Jasmine Parra





Developing Professionals Forum

The Developing Professionals Forum, formerly known as the Student Forum, is an organization within The American Society for Clinical Laboratory Science Illinois (ASCLS-IL). The purpose of the ASCLS-IL Developing Professionals Forum is to provide an environment for students and developing professionals to participate and communicate with others in the society. Through planned activities, members will increase their own professional awareness and knowledge. Planned activities may also involve interaction with the public via seminars, exhibit booths, or fundraisers to enhance the public's knowledge of the medical laboratory profession.

Early Detection and Evaluation of Elevated Testosterone and Glucose Intolerance in Patients with Polycystic Ovarian Syndrome

By: Millie Wallace, Developing Professional Forum Vice Chair

Introduction

Within Medical Laboratory Science (MLS), it is crucial to create and implement assays that accurately produce viable results for physicians to interpret. Laboratory scientists are primarily responsible for much of the diagnostic testing regarding hormonal disorders such as polycystic ovarian syndrome (PCOS). Polycystic ovarian syndrome is a current, prevalent disease and can be defined as a lifelong endocrine disorder primarily affecting a female's reproductive organs in addition to altering the normal level of hormones in the body.¹ This imbalance in hormones has also been heavily linked to glucose intolerance as well as a severely high risk of developing type 2 diabetes.¹ Additionally, this disorder manifests as elevated testosterone levels that can then result in the abnormal production of ovarian cysts, improper ovulation, and amenorrhea.¹

Ovarian cysts are fluid filled growths that are usually benign but can carry an increased risk of malignancy with age, while amenorrhea is the total lack of menstruation.¹ PCOS has additional primary symptoms that include hirsutism and infertility due to an increase in the total testosterone in the body and a decrease in the levels of estrogen.¹ Secondary clinical manifestations of this endocrine disorder include a higher risk of developing cardiovascular disease, osteoporosis, hypercholesterolemia, and glucose intolerance (indicated through the diagnosis of type 2 diabetes in female patients of childbearing age).¹

There are multiple methods and tests that can be done to aid in the diagnosis of this disorder; however, the main test that is used to assess whether an individual has PCOS is a testosterone test. Moreover, the presentation of multiple cysts on one or both ovaries via intrauterine ultrasound is another diagnostic factor. This literature review will assess the correlation of glucose tolerance and elevated testosterone in addition to early detection and evaluation of these factors. Genetic inheritance may also play a role in the development of PCOS, therefore, early detections discussed in this review will also include the possibility of detection based on genetic biomarkers.

Polycystic Ovarian Syndrome and Diagnostic Factors

Regarding the diagnosis of PCOS, there are typically three criteria for successfully diagnosing patients with this disorder, specifically for the morphologic factors.² According to Rocha et al, authors of "Recent Advances in the Understanding and Management of Polycystic Ovarian Syndrome," one of the criteria includes the presence of polycystic ovarian morphology (PCOM) which can be defined as follicular number of cysts per ovary of either ten or twelve milliliters.² This article additionally stated that the advancement in technology surrounding ultrasound instruments has vastly improved within the last decade allowing for a higher level of detail to be seen when viewing the ovaries via ultrasound.² This allows for more follicles to be seen which can potentially raise the follicle count average in patients being screened for PCOS.² Because of this advancement in technology, researchers and specialized physicians have recently proposed increasing the diagnosing threshold to more follicles per ovary (up to 25 follicles per ovary) for PCOM criteria for the ultrasound instruments.²

In addition to this, scientists recently correlated serum anti-Mullerian hormone (AMH) levels with follicle count in patients with PCOS, suggesting that serum AMH levels could be used in conjunction or as a proxy to be used mutually with ultrasound technology.³ Even though there has been an abundance of progress and studies regarding the strong correlation between serum AMH levels and ultrasounds, AMH levels alone are not authorized to be used as a lone marker for the diagnosis of PCOS.³

Polycystic Ovarian Syndrome and Progression Throughout Life

Although PCOS is a common endocrine disorder among women across the globe, there is very little research on the progressive stages throughout the course of a patient's life. This is primarily because while there are treatment options available, there have not been many studies specifically designed around following up years after a PCOS diagnosis.² Another inhibiting factor is the lack of information as to what necessarily causes PCOS, which will be further discussed in this essay. According to Rocha et al, there was a small study conducted involving a longitudinal sample of patients diagnosed with PCOS where women of childbearing age (around age 25-35) were studied after a six-year follow up.² Within this small study, researchers noted that increased age was slightly correlated with higher rates of regular menstrual cycles and a reduction in androgen levels when testing serum samples in these patients.²

In childhood, there has not been extensive research on PCOS since current diagnostic mechanisms are measured during child bearing age; however, genetic predispositions may be able to predict the risk of a child developing this disorder later in life.⁴ Further studies have shown that intrauterine growth restriction and increased androgen levels could potentially increase this risk of developing PCOS.⁴ Patients are most commonly diagnosed with PCOS in adolescence typically based upon observation and concern with irregular menstruation and the prevalence of ovarian cysts.⁵ Other common symptoms found in early to mid-adolescence include hirsutism and hormonal acne, but these symptoms alone are commonly overlooked, as they can be mistaken for normal hormonal changes in the body.⁵ Current risk factors correlating to PCOS development risk in adolescence include a past family history of the disorder, environmental factors in place during childhood, low or premature birthweight, high BMI index (indicated by being in the overweight or obese range), and early-onset puberty.^{2,6} For adolescents, more stringent criteria are in place for diagnosing individuals with this disorder.

Elevated levels of testosterone and dysfunction of the ovaries that are prevalent for more than two year preceding menarche is adequate criteria for diagnosing adolescents with PCOS.² Rocha et al further noted that once an adolescent has been officially diagnosed with PCOS, it is crucial for them to implement a healthier lifestyle as soon as possible in order to avoid or lower the risk of secondary complications associated with the disease.² Secondary complications associated with the disorder include hyperinsulinemia, which is defined as elevated levels of insulin in the blood that can be a predisposing factor of developing type 2 diabetes. Insulin resistance should be carefully examined in patients with this hormonal disorder since additional factors such as eating disorders, poor diet, and insufficient nutrition intake can increase the risk of these complications. Participating in regular and consistent exercise along with self-care is important to suppress the risk of adverse disease outcomes.²

In postmenopausal patients, or women after the age of 55,

hyperandrogenism is still prevalent with a higher risk of having cardiovascular disease.⁷ For older patients with this disorder, there are additionally studies that show postmenopausal women are at an increased risk of decreased bone density and osteoporosis.⁷ Studies have shown a significantly elevated risk of developing endometrial hyperplasia, which can in turn heighten the chances of the growth converting into a carcinoma.⁸ Regarding the treatment of PCOS, this disorder cannot be cured; however, management treatments are put in place to lower the risk of developing long-term complications such as heart disease type 2 diabetes, and hyperplasia. A healthy diet along with contraceptives and antiandrogens are given to decrease levels of androgen in the body as well as protecting the uterus from endometrial hyperplasia.⁸

Polycystic Ovarian Syndrome and Genetics

Even though this disorder has been observed and studied for nearly fifty years, the exact cause is currently unknown— though there may be some genetic factors involved. According to Khan et al., there has been minimal research performed on possible genetic influences on the development of PCOS, but that some of the findings could indicate the presence of certain gene mutations in cases of this disorder.⁹ The authors of this article further mention that due to extreme complexity consisting of numerous mechanisms and proteins, a singular diagnostic test (involving molecular and genetic-based factors) cannot be fashioned.⁹

Findings show that the number of genes involved in the initial manifestation and development of PCOS is multifactorial, meaning there is a high chance of there being numerous genetic mutations that contribute to the development of this endocrine disorder.⁹ Previous genetic findings analyzed the possibility of multiple genes contributing to infertility through both direct and indirect mechanisms. Even though this research was thorough in identifying possible genes, there was no specific gene across participants that directed researchers to believe that there is one definite gene.⁹ Khan et al. stated that “identifying causal variants in genes that may alter its expression or subsequent protein function helps to delineate the genetic architecture of this multifactorial disorder,” while further mentioning that “tissue-specific epigenetic alterations that do not affect the genetic code have been reported to be responsible for phenotypic plasticity”.⁹ These findings have persuaded scientists to believe that there are numerous genetic factors that play a role in the development of this disease, but that additional studies should be conducted to confirm the validity of this data presented. In order to truly unfold the genetic mechanisms behind PCOS, scientists would need to explore patterns related to proteins and accurately associate this data with biomarkers that could then be definitively tested for in a genetic/molecular assay.⁹

Furthermore, Khan et al. described twin studies (both monozygotic and dizygotic) that may imply this endocrine disorder is X-linked based on the findings that it is not associated with a monogenic illness nor is it suspected to be an autosomal dominant disease.⁹ These studies additionally stated that there was a variance of approximately 72%, validating that the risk of PCOS is due to genetic factors rather than purely being environmental.⁹ Specifically in women with European ancestry, there has been specific variants of the DENND1A gene that researchers have found to have a strong association with PCOS.¹⁰ This finding is limited, however, due to only a certain population being selected for this study. Nonetheless, the data produced can certainly aid in assessing variants of other genes responsible for causing PCOS in women of other ethnicities and ancestry.

Polycystic Ovarian Syndrome, Glucose Intolerance, and Free Testosterone

This chronic endocrine disorder's high correlation with glucose intolerance has been heavily studied by researchers and scientists globally, stating that there could be numerous factors at hand when determining the reasoning behind PCOS and impaired glucose tolerance.^{11, 12} Testing and early evaluation for different substances is crucial to identifying the endocrine disorder as early as possible, and it is additionally important for MLS to continually re-evaluate numerous assays that can be developed for early detection. Bu et al., authors of "The Relationship Between Polycystic Ovary Syndrome, Glucose Tolerance Status, and Serum Preptin Level," assessed the association involving impaired glucose tolerance and serum preptin level.¹¹ Preptin is a specific peptide hormone that is "co-secreted with insulin in response to glucose, [and] recent studies have shown that preptin enhances insulin secretion in rats, and that there is a potential association between preptin and insulin resistance in humans".¹¹ According to Bu et al., the results of the study showed that there is a hefty correlation between glucose intolerance status and high serum preptin levels in the body.¹¹ An important note to amplify in this academic journal is the documentation that high serum preptin levels were associated with glucose intolerance, but not necessarily for PCOS status.¹¹ This could be useful for laboratory professionals to help diagnosis the early stages of glucose intolerance in patients with this disorder.

Regarding standardized glucose tolerance testing, the Androgen Excess Society suggests that every individual diagnosed with PCOS be given an oral glucose tolerance test to observe for impaired tolerance.¹² The authors of "Glucose intolerance in polycystic ovary syndrome--a position statement of the Androgen Excess Society" stated

that the test may only need to be performed on those with a total body mass index at or greater than 30 kg/m², but that patients within the acceptable body mass index should still be screened once every two years to observe for any abrupt changes in tolerance.¹² Moreover, Salley et al. further stated that glucose tolerance screens should be performed regularly if the patients (within the acceptable body mass index range) exhibit multiple risk factors associated with PCOS.¹² According to the American Diabetes Association, individuals with this endocrine disorder are statistically more likely to display an impaired fasting glucose as well as an impaired glucose tolerance even though they were observed to have hyperinsulinemia.¹³ Appertaining to hyperinsulinemia, Karakas emphasized that insulin sensitizers can aid in reversing ovarian dysfunction and elevated androgen in the body and that "assessing glucose homeostasis by an oral glucose tolerance test (OGTT) has become a common practice".¹³

Polycystic Ovarian Syndrome and Free Testosterone

Researchers have also examined that patients with increased free testosterone levels were known to possess unfavorable metabolic profiles that include fasting glucose, insulin resistance and sensitivity, cholesterol, and hemoglobin A1C.¹⁴ Even though levels of testosterone can be examined and reported out to physicians to interpret, there is no official or standardized assay for measuring testosterone in women.¹⁵ The Endocrine Society has recommended that liquid chromatography mass spectrometry be used as the favored test, noting that many current testosterone assays for women are insufficient in sensitivity and accuracy.¹⁵

Conclusion

In conclusion, patients diagnosed with PCOS often carry ample secondary clinical conditions that range from type 2 diabetes to hypercholesterolemia. While there is not much research on the progression of the disease throughout the stages of life, factors and secondary long-term complication can persist even after menopause.² This highlights the importance and proper maintenance of the disease once a patient has been diagnosed. In addition to adverse health outcomes, the prevalence of ovarian cysts continues to be an important diagnostic factor, where healthcare professionals utilize extremely precise ultrasound technology to accurately detect PCOM in the reproductive tract of patients.²

The fluctuation of hormones in the body has been correlated with glucose intolerance, and testosterone specifically is increased in cases of this disorder.^{1, 11, 12} Multiple genetic factors come into play with this disease, and while researchers have isolated certain variants of genes, no set gene variant across ancestries has been identified.¹⁰ Further evaluation should be done on testosterone testing in women to yield the most appropriate test that can aid in the early detection and management of PCOS.

"Within Medical Laboratory Science (MLS), it is crucial to create and implement assays that accurately produce viable results for physicians to interpret. This literature review will assess the correlation of glucose tolerance, genetic inheritance and elevated testosterone in addition to early detection and evaluation of these factors." — Millie Wallace

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Discovering a Passion for Blood Bank During the Pandemic

By: Emily Zimmerman, MLS(ASCP)^{CM}

While taking classes and going through clinical rotations, many students discover a department they prefer more over the other, for many reasons. Then, once students finish their degree and start their careers in the laboratory, they may find that they prefer a different department in the lab because of different experiences.

During the MLS Program at the University of Illinois Springfield, I developed an interest in Chemistry due to the ease and repetitiveness of loading and unloading specimens (during clinical rotations). I also enjoyed correlating lab values to different disease processes, such as kidney failure and diabetes.

Once I started my career in the lab, an experience that has had a significant impact on me from the start has been the coronavirus pandemic, specifically, working in Blood Bank during the pandemic.

During the pandemic, patients are often only coming to the hospital if there are extremely sick, resulting in an increase in blood product usage. This normally would be manageable for hospitals, however, there has been a huge shortage of blood products during the pandemic due to a decrease in blood donations. This has put more stress on blood centers and hospitals as they struggle to meet the demand of blood products needed.

Despite this, I enjoy being in Blood Bank. Ever since I started my career at this hospital, I had an interest in Blood Bank over the other departments. As the coronavirus pandemic progressed, my interest in Blood Bank slowly started growing into a passion.

One reason I have a passion for Blood Bank now is that lives are being saved, more so than any other department. Finding compatible blood for patients for transfusion to help keep patients alive and not give them any adverse reactions that may harm them, can be life or death in many instances. In addition, working with the extremely limited inventory of blood products has been a challenge as well. As more complicated cases come into Blood Bank, such as ABO discrepancies, multiple alloantibodies, special transfusion requirements, etc., it motivates me even more to do all the proper testing to ensure patients receive compatible, safe blood products. This may mean life or death for a patient that desperately needs blood or prolonging the lives of cancer patients undergoing chemotherapy.



Promoting Exceptional Clinical Instruction Within Your Laboratory

Strategies for Clinical Teaching in the Health Professions: A Guide for Instructors By Wendy Miller Routledge (2021) ISBN: 978-0-367-67716-9

Introduction

Access to high quality instruction in an authentic clinical environment is a must if medical laboratory science training programs are to graduate competent, efficient laboratory practitioners. The key to providing this technical instruction is the clinical instructors working in laboratories. To assist clinical staff in developing as educators, the text *Strategies for Clinical Teaching in the Health Professions: A Guide for Instructors* is packed with resources for those who are new to teaching in the clinical environment, as well as tips for seasoned faculty looking to strengthen their teaching practices.

Chapter Outline

This practical book is divided into three sections. The first section, *Born to Teach*, explores the process of becoming a clinical instructor. It describes the responsibilities of this role and the traits of effective clinical instructors. Introducing the concept of teacher identity, this section also offers suggestions for successfully making the transition from healthcare practitioner to clinical educator.

The second section, *Learn to Teach*, shares essential information necessary for teaching in the healthcare environment. It introduces principles of curriculum design and planning, pedagogy and teaching strategies, performance assessment, and the delivery of constructive feedback. The final chapter in this section discusses ways to help students prepare for entry into the healthcare workforce.

The final section of the book, *Support for Those Who Teach*, was written specifically for managers and supervisors. Included in this final chapter are ways to support the clinical instructors who must balance their clinical workload with the rigors of training students in the department.

Each chapter includes tips for dealing with challenging student situations, sample assessment rubrics and evaluation templates, and reflective practice exercises. This useful book not only provides a foundation for the laboratory practitioner who is beginning a career in clinical education, but also serves as a valuable reference for more experienced teachers and those who manage clinical instructors.

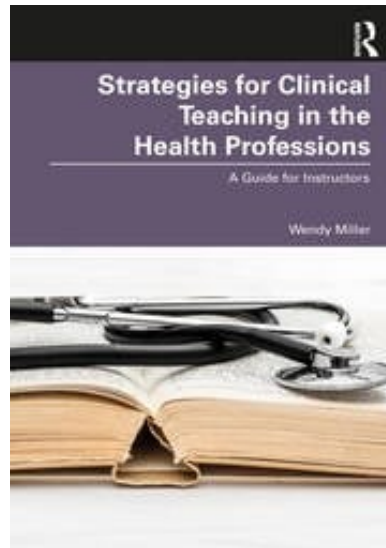
About the Author

Wendy Miller EdD, MT(ASCP)SI, is the Dean of the Health Professions, Math, Science, and Engineering Division at Elgin Community College (ECC) in Elgin, Illinois. She is responsible for managing the curricula and programmatic accreditations, as well as promoting faculty development. Dr. Miller began her career in healthcare as a medical technologist in the immunovirology laboratory at Lutheran General Hospital, Park Ridge, Illinois. There she served as a clinical instructor for the hospital-based school of medical technology before coming to ECC to develop the Associate of Applied Science degree programs in Clinical Laboratory Technology and Histotechnology. Dr. Miller's dissertation research focused on developing a theory of clinical instructor identity, and her passion is helping clinical faculty engage in their instructional roles and embrace a sense of identity as educators. Dr. Miller is available for consultations and workshops with healthcare practitioners who are interested in expanding their teaching and learning skill set.

Recommendation

"I really enjoyed Dr. Miller's book, which I purchased after attending a conference that she spoke at. This book discusses teaching strategies in the clinic, how to improve feedback to students, and more accurately assess their clinical skills. It also discusses support for managers of clinical education. It is important for clinical instructors to continue to grow in their teaching, just as it is important for healthcare providers to continue to grow. This book is definitely helpful in this aspect and well written."

~Heather Riley, PTA, Site
Coordinator of Clinical Education,
OrthoIllinois Rehabilitation



Born to Teach

Chapter 1: Becoming a Clinical Instructor

Chapter 2: Developing Teacher Identity

Learn to Teach

Chapter 3: Designing a Clinical Rotation

Chapter 4: Selecting Teaching Strategies

Chapter 5: Assessing Clinical Performance

Chapter 6: Giving Feedback

Chapter 7: Preparing Students for Entry into the
Workforce

Support for Those Who Teach

Chapter 8: Supporting Clinical Instructors

Name the Department



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- Promoting the value of the profession to healthcare and the public
- Uniting the profession to speak with one voice
- Advocating on behalf of the profession
- Promoting professional independence
- Enhancing quality standards and patient safety
- Ensuring workplace safety
- Providing professional development opportunities
- Promoting expanded roles and contributions of clinical laboratory professionals to the healthcare team
- Increasing the diversity in the profession and expanding the voice and role of under-represented individuals and groups



For any and all of the above, please feel free to contact the organization at: ASCLS.IL.Information@gmail.com

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