

# 2023 AACC Middle East

## A partnership of AACC and LifeDx.

### PRESENTATION DESCRIPTIONS AND LEARNING OBJECTIVES

#### KEYNOTE

##### **Transforming Clinical Laboratory Services through Data Analytics**

*Shannon Haymond, PhD, MSPA, DABCC, FAACC*

**Description:** Given the size and depth of data available to clinical laboratories, theoretically the raw materials for data-informed decision making have never been more plentiful. Many institutions are motivated to better utilize their data assets and are investing in this area. Proliferation of open-source software and low-code or no-code tools is making data analytics widely accessible. But we will limit our effectiveness without appropriate capacity for data analytics and strengthened data literacy skills. This keynote will describe ways data analytics is transforming clinical laboratory services and discuss the potential impacts of newly emerging technologies and trends.

**Learning Objectives:**

1. Describe the types of data analytics available to clinical laboratories.
2. Discuss application of data analytics to clinical laboratory operations.

#### SESSION 1: Screening from Newborn to Childhood

##### **Understanding the Risks and Benefits of Prenatal Screening to Support Informed Decisions**

*Ahmad Alfares, MD, FRCPC, FACMGG, FABMGG*

**Description:** Prenatal screening is important because it can help identify potential health problems in a fetus early on in pregnancy. This can give parents time to make informed decisions about their pregnancy, such as whether to continue with the pregnancy or to terminate it. Prenatal screening can also help doctors prepare for the birth of a child with special needs. This presentation will discuss the different types of prenatal screening tests, what they can detect, and when they are typically performed. Also discuss the risks and benefits of prenatal screening, and how parents can make informed decisions about whether or not to have these tests. The audience will be able to understand the risks and benefits of prenatal screening,

**Learning Objectives:**

1. Define prenatal screening and explain its importance.
2. List the different types of prenatal screening tests and what they can detect.
3. Discuss the risks and benefits of prenatal screening and explain how parents can make informed decisions about whether to have prenatal screening tests.

##### **Endocrine Disorders in Newborns and Beyond**

*Deborah French, PhD, DABCC, FAACC*

**Description:** Endocrine disorders have the potential to cause severe morbidity and mortality if left untreated. Newborn screening programs are used to identify newborns with congenital hypothyroidism and congenital adrenal hyperplasia and patients with these disorders may require treatment throughout life. This presentation will discuss newborn screening for endocrine disorders and the laboratory testing used to identify and monitor them. This will enable attendees to obtain an understanding of newborn screening for endocrine disorders and be able to evaluate endocrine testing capabilities in their laboratories.

**Learning Objectives:**

1. Describe the endocrine disorders detected by newborn screening.
2. Describe the laboratory testing used to identify and monitor these endocrine disorders.

## At the Heart of Pediatric Lipid Screening

Amy K. Saenger, PhD, DABCC, FAACC

**Description:** Over the last two decades, pediatric lipid screening recommendations have evolved from a targeted to universal strategy; however, provider surveys/ordering data suggest poor compliance with universal testing in primary care settings. Familial hypercholesterolemia (FH) is a prevalent, yet under-recognized genetic disease that presents with hyperlipidemia in childhood. Untreated FH can result in premature cardiovascular disease and death. Recent studies suggest that specific lipid-lowering interventions started in childhood can drastically reduce FH associated morbidity/mortality. This session will highlight how clinical labs can help: 1) aid in increasing compliance with universal lipid screening recommendations in children and 2) improve early recognition of FH. Participants will learn the evolution of pediatric lipid screening recommendations, barriers to universal screening, and lab interventions to improve compliance including education and use of point-of-care testing.

**Learning Objectives:**

1. Describe the evolution of pediatric lipid screening recommendations from various clinical societies, barriers to compliance with current recommendations, and lab interventions to improve universal screening rates.
2. Identify why familial hypercholesterolemia is under-diagnosed and select testing options and lab actions that may increase early recognition of familial hypercholesterolemia.

### Session 2: Laboratory Testing and Preventive Medicine

## Population Genomic Screening: Casting an Ever-Widening Net

Linnea Baudhuin, PhD, DABMGG, FACMG

**Description:** Advances in clinical genomic sequencing technologies and capabilities have led to increased interest in genomic screening in healthy populations. Population genomic screening is distinct from indication-driven genetic testing and relies on testing of individuals without prior suspicion of genetic risk. With appropriate evidence-based testing and clinical management, population genomic screening has the potential to improve population health. Recent guidelines have been developed to guide programs and laboratories who are considering population genomic screening. Next generation sequencing is a powerful tool for genomic screening but there are differences between and gaps in technologies. Furthermore, the optimal utility of personalized medicine continues to be challenged by the lack of large-scale genomic and phenotypic data sets specific to diverse populations. Overall, population genomic screening has many promises and challenges which will be discussed during this presentation.

**Learning Objectives:**

1. Recall laboratory and clinical guidelines for population genomic screening.
2. Discuss differences in next generation screening as a tool for population genetics.
3. Understand gaps in genotype-phenotype databases and efforts to improve large-scale diverse datasets.

## The Role of Laboratory Testing in Prevention of Chronic Hepatitis

Andrew Craig Don-Wauchope, MD, FRCP Edin, FRCPath

**Description:** Chronic hepatitis can progress to more severe liver disease and the prevention or early detection of the infective causes of chronic hepatitis is an important preventative medicine topic. This presentation will provide an overview of the laboratory testing that supports the detection and monitoring of chronic hepatitis B and chronic hepatitis C. Recent clinical practice guidelines will be discussed to enable the audience to apply the clinical practice guidelines in their context.

**Learning Objectives:**

1. Discuss the laboratory tests that aid in prevention of chronic hepatitis B and C.
2. Recognize opportunities within the laboratory to appropriately guide utilization of clinical practice guidelines.

## Connecting the Dots: HPV, Cancer, and the Vital Role of Laboratory Medicine

Hisham Shams, MD, PhD

**Description:** This presentation will begin by discussing the current state of human papillomavirus (HPV) testing in cervical cancer screening. We will discuss the various types of HPV testing that are available and how they are used in conjunction with Papanicolaou (Pap) tests and colposcopy to screen for cervical cancer. We will then shift to the growing role of HPV in oropharyngeal cancers. Dr. Shams will explain how HPV is becoming a more common cause of oropharyngeal cancers and

the potential for HPV testing to be used as a screening tool for oropharyngeal cancers, although more research is needed in this area. Next, we will focus on the emerging technologies that may improve HPV testing accuracy, such as next-generation sequencing and digital PCR, highlighting the need for continued research into development of new technologies and strategies for HPV testing.

**Learning Objectives:**

1. Explain the current state of HPV testing and screening for cervical cancer.
2. Discuss the growing role of HPV in oropharyngeal cancers.
3. Explore emerging technologies and techniques that may improve HPV testing accuracy and efficiency.

### Session 3: Hot topics in Laboratory Diagnostics

#### Hemoglobin Testing Implications in Transfusion Settings

*Laila Alsuwaidi, BSc, MSc, PhD*

**Description:** To be provided

**Learning Objectives:**

1. To be provided

#### Unraveling the Mystery: Serological and Molecular Markers of Celiac Disease

*Rania Bedair, MD, PhD*

**Description:** Celiac disease is a common autoimmune disorder that affects approximately 1% of the population worldwide. The diagnosis of this condition can be challenging, as symptoms can vary widely, and no single diagnostic test exists. However, recent advances in serological and molecular markers have improved our understanding of this condition. In this talk, I will discuss the latest research on serological and molecular markers for celiac disease. I will explain how these markers can aid in the diagnosis of the disease and discuss the potential of these markers for predicting disease outcomes. Additionally, I will highlight the implications of these markers for the development of new therapeutic approaches. After this talk, the audience will have a clear understanding of the current state of research on serological and molecular markers for celiac disease. They will be able to use this information to make more informed decisions about the diagnosis and management of celiac disease, potentially improving outcomes for patients.

**Learning Objectives:**

1. Discuss the latest serological and molecular markers used for diagnosing celiac disease.
2. Understand how these markers can help in predicting disease outcomes and developing new therapeutic approaches for celiac disease.
3. Assess the implications of the latest research on celiac disease management and make informed decisions about diagnosis and treatment options.

#### Current Use of Bone Turnover Markers in the Management of Osteoporosis

*Andrew Craig Don-Wauchope, MD, FRCP Edin, FRCPATH*

**Description:** Osteoporosis is a common condition and laboratory testing using bone turnover markers is useful to monitor the effectiveness of osteoporosis medications. This presentation will provide an overview of bone turnover marker assays, the clinical utility of the bone turnover markers (with a focus on osteoporosis), and the impact on the clinical laboratory. This information will enable the audience to apply current best practices in the choice of bone turnover marker assays within their laboratories and discuss appropriate utilization of bone turnover markers with the clinical user.

**Learning Objectives:**

1. Apply best practices in use of bone turnover marker assays for monitoring osteoporosis.
2. Discuss utilization and interpretation of bone turnover marker results with clinicians.

### KEYNOTE: An Interactive Session Between the Laboratory and Emergency Medicine Regarding Utilization of High-Sensitivity Troponin

## A Laboratorian's Perspective

Amy K. Saenger, PhD, DABCC, FAACC

## An Emergency Physician's Perspective

Tashfeen Siddiq Ali, MBBS, BSc, MRCEM, PGCCM, FRCEM

**Description:** Rapid rule-out, rule-in, and diagnosis of acute myocardial infarction (AMI) is critical for appropriate triage of patients in the Emergency Department and accurate diagnosis is critical. High-sensitivity cardiac troponin (hs-cTn) assays are a cornerstone to aid in the diagnosis of AMI and the recommended biomarker for hospitals providing acute cardiac care. This session will be an interactive discussion and include presentations from the perspectives of the clinical laboratory and emergency medicine, addressing utilization of hs-cTn employed in clinical practice. The role of the central laboratory and point-of-care hs-cTn assays will discuss: 1) AACC/IFCC clinical laboratory practice guidelines for defining quality control, normality and sex-specific 99th percentile upper reference limits; 2) the Fourth Universal Definition of Myocardial Infarction guidelines for diagnosis of type 1 myocardial infarction, type 2 myocardial infarction, and myocardial injury; 3) early myocardial injury and infarction rule out strategies; and 4) assay interferences, such as macrotroponin.

### Learning Objectives:

1. Clarify the role of high-sensitivity cardiac troponin testing thresholds in assessing patients for early rule of myocardial infarction versus ruling in myocardial injury and infarction.
2. Describe the role of the laboratory in establishing appropriate quality control protocols within the sex-specific 99th percentile upper reference limits for optimal patient care.
3. Summarize the advantages and limitations of using point-of-care hs-cTn assays in clinical practice.

## SESSION 4: Role of Genomics in Diagnosis and Treatment

### Genetic Testing for Hereditary Cardiovascular Disorders

Linnea Baudhuin, PhD, DABMGG, FACMG

**Description:** Numerous types of cardiovascular pathologies have a hereditary basis, including cardiomyopathies, arrhythmias, aortopathies, and dyslipidemias. Genotypic heterogeneity and phenotypic overlap support the use of high throughput genetic analyses to aid in the diagnosis of these disorders. Clinical descriptions and genetic testing will be discussed in this presentation, along with gene-based management strategies. Variant analysis and interpretation and the increasingly important role of laboratory-based genetic counselors will also be discussed.

### Learning Objectives:

1. Recognize different types of inherited cardiovascular disorders for which genetic testing is available.
2. Recall recommendations for gene panel testing and variant interpretation.
3. Discuss the important role that genetic counselors play in laboratory testing for hereditary disorders.

### Role of Genomics in Diagnosis and Treatment of Cancer: Solid Tumors

Byoungkwon Kim, MD, PhD

**Description:** Cancer research using genomics tools has reached its pinnacle and now the results have been rapidly applied to the clinical field. Its application in diagnosis of solid tumor and treatment decision is growing very fast and the indication is broadening very quickly. The current talk will introduce the trends in this field, cover the recent updates and touch on the future direction. The Human Genome Project indeed sparked research of cancer genetics followed by cancer genomics. More recently cancer transcriptomics is showing explosive growth. In the market of cancer genomics or precision oncology, genomics services have spread widely, and players are tackling impossible goals such as cancer early detection. Lung cancer is the most advanced area of cancer genomics even adopting liquid biopsy even though under limited condition. Multigene test in breast cancer is an example of another omics. Due to the development of targeted therapies and immune checkpoint inhibitors, histology agnostic biomarkers have been introduced recently. In the future, spatial information will be combined with genomics technology, and this will address many issues in cancer research and bring in valuable tools in the clinic.

### Learning Objectives:

1. Recognize the trends in cancer genomics research and precision oncology.
2. Give examples of genomic application in cancer diagnosis and treatment.
3. Predict future progress of clinical cancer genomics.

## Putting Pharmacogenomics and Companion Diagnostics into Practice: Improving Outcomes and Reducing Adverse Reactions

Ahmad Alfares, MD, FRCPC, FACMGG, FABMGG

**Description:** Modern medicine includes pharmacogenomics and companion diagnostics; however, many laboratorians remain unaware of the benefits or unable to apply the principles. At its root, this growing field illuminates how genes affect drug response and allows healthcare providers to choose genetically tailored treatments that improve drug efficacy and reduce side effects. Including a patient's genetic profile in the diagnosis and treatment decisions helps physicians choose the right medication for the right individual to improve patient treatment. Pharmacogenomics and companion diagnostics can also identify patients who are more likely to respond to a therapy and those who may have adverse reactions, according to the presentation. This presentation will help the audience understand the role of pharmacogenomics and companion diagnostics in personalized medicine and how it can improve patient outcomes. They will learn about the latest advances in this field, how it is being used in practice, and how it can identify patients at risk of adverse drug reactions. This presentation will help the audience improve patient care in their practice.

### Learning Objectives:

1. Understand the basics of pharmacogenomics and companion diagnostics. This includes learning about the different types of pharmacogenomic tests, how they work, and how they can be used to improve the safety and efficacy of drug therapy.
2. Identify the challenges and opportunities in the field of pharmacogenomics and companion diagnostics.
3. Be able to make more informed decisions about drug treatment based on pharmacogenomic information. This includes learning how to interpret pharmacogenomic test results and how to communicate these results to patients.
4. Advocate for the development of new pharmacogenomics and companion diagnostics tests. This includes learning about the benefits of these tests and how they can improve the health of patients.

## SESSION 5: Quality and Laboratory Management

### How Can the Clinical Laboratory Help Ensure Sample Quality?

Deborah French, PhD, DABCC, FAACC

**Description:** Preanalytical errors account for a significant proportion of total errors associated with laboratory testing. Examples include errors in test selection, patient preparation, sample collection, sample transportation and sample processing. This presentation will cover examples of pre-analytical errors and strategies the clinical laboratory can use to help mitigate them enabling the audience to implement some of these changes in their clinical practice.

### Learning Objectives:

1. Describe common preanalytical errors.
2. Identify ways to help mitigate common pre-analytical errors.

### QC or not QC: A Guide to Risk-Based Quality Control Strategies

Christopher McCudden, PhD, DABCC, FACB, FCACB

**Description:** Risk-based quality control focuses on the systematic assessment and management of risks associated with laboratory processes, procedures, and activities to ensure reliable results. Risk-based QC involves the application of risk management principles to determine the appropriate quality control measures based on the potential impact and likelihood of errors or failures. Adoption of a risk-based approach to QC enables laboratories to allocate resources more efficiently, focus efforts where they are most needed to prevent errors, and balance the benefits of running QC against the risks of the test. This approach allows laboratories to tune their quality control procedures to the specific risks associated with their local test population, instrumentation, environment, and staffing, promoting a culture of continuous improvement, and enhancing overall laboratory quality. This talk will focus on how to establish a risk-based QC program using real world examples and the latest best practices and regulatory guidelines.

### Learning Objectives:

1. Define risk-based quality control.
2. Describe the benefits of risk-based quality control.
3. Explain how to implement a risk-based quality control program.

## **Influence: An Essential Skill for Laboratory Leaders**

*Shannon Haymond, PhD, MSPA, DABCC, FAACC*

**Description:** Influence, the ability to affect others' opinions, ideas, and actions, is key to successful leadership. Anyone can be an influencer, since it is independent of positional hierarchy, role, or title. Authority, however, is often due to position within the organization. Leaders can achieve compliance through authority, but true commitment is gained through influence. Importantly, even in the absence of authority, influential leaders are able to gain engagement, endorsement, and support for their ideas or plans. This presentation will focus on influence. Attendees will first compare their areas of impact vs authority to identify numerous examples of where they need influence. Next, the group will learn about the attributes of top influencers and the different styles of influence. Finally, attendees will be exposed to a self-assessment and instructed on how to use the results to create an action plan for enhancing their influencing skills.

**Learning Objectives:**

1. Describe the role of influencing skills in laboratory leadership.
2. Create an action plan for enhancing influencing skills in practice.

### **SESSION 6: Expanding Lab Medicine Testing**

## **Breaking Boundaries: The Progress and Potential of Continuous Glucose Monitoring in Diabetes Management**

*Dima Abdelmannan, MD, Msc, HPEd, FRCP*

**Description:** Diabetes, being a chronic disease, necessitates continuous monitoring and management to avoid complications. The development and improvements in continuous glucose monitoring (CGM) technology have revolutionized diabetes care allowing for more precise insulin dosing and identifying trends and patterns that can be used to optimize treatment plans. The presentation will cover a comprehensive review of CGM technology, tracing its evolution, understanding its mechanisms, and exploring its benefits and limitations. Real-world examples will be shared to provide a practical understanding of how CGM is used and the difference it can make in a patient's life. Healthcare professionals will gain an understanding of how to incorporate CGM technology into their clinical practices. They will be better equipped to counsel their patients about its use, troubleshoot potential issues, and interpret CGM data to adjust treatment plans accordingly.

**Learning Objectives:**

1. Introduce the concept of Continuous Glucose Monitoring (CGM) and outline its technological advancements over the years.
2. Highlight the emerging trends in CGM technology.
3. Discuss accessibility and affordability of CGM, considering various global healthcare systems and patient demographics.

## **Digital Diagnostics and Mobile Health in Laboratory Medicine**

*Laila Abdel Wareth, MBBCh, FCAP, FRCPC, EMHCA*

**Description:** Digital innovations are rapidly transforming the healthcare landscape. It has many facets that we are now seeing in our daily practice including electronic medical records, laboratory management software, performance analytics software, clinical decision support among others. Mobile health or "mHealth", is the application of mobile devices technologies to healthcare. This presentation will discuss the various aspects of mHealth as far as diagnosis and monitoring of diseases is concerned. We will also discuss the challenges and governance structure that is required to ensure safe delivery and maximum efficiency of mHealth.

**Learning Objectives:**

1. Define digital health and mobile health (mHealth).
2. Discuss the various applications of mHealth in laboratory medicine.
3. List the challenges facing the widescale application of mHealth.

## **Application of Artificial Intelligence in Laboratory Medicine: Potential, Pitfalls, and Pragmatism**

*Christopher McCudden, PhD, DABCC, FACB, FCACB*

**Description:** In the last decade, artificial intelligence has gone from specialized application and theoretical potential to explosive growth and implementation. In laboratory medicine, there are many evolving uses for AI ranging from improved quality assurance to result interpretation and predictive medicine. This talk focuses on describing the basics of AI in the laboratory, discussing some existing applications, and the evolving and potential future uses. Along with the tremendous potential of AI, there are risks and challenges with the technology including data access, bias, generalizability, ethics, and privacy. These aspects will be discussed along with mitigation strategies. The talk will include interactive questions and examples of the latest available technology, including large language models, such as ChatGPT, and other available generative AI tools.

**Learning Objectives:**

1. Describe current and potential future applications of AI in lab medicine.
2. Discuss challenges and risks for AI implementation in medicine.