



Ontario Society of Clinical Chemists
La Société des Clinico-Chimistes d'Ontario

Clinical Biochemistry: Surfing the Wave of Data

2014 Ontario Society of Clinical Chemists
Annual Scientific Meeting

October 30th, 2014
Ottawa, Ontario

*Discuss the current challenges in analyzing clinical
laboratory data and tools for data mining*

This event is an Accredited Group learning activity as defined by the Maintenance of Certification Program of the CSCC/CACB Professional Development Program.

Sponsors for the event:

GOLD

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SCIENTIFIC AND SOCIAL PROGRAM

0800 – 0900	Registration and Breakfast (<i>Roger Guindon Atrium</i>)
0830 – 0915	OSCC Annual General Meeting (<i>Roger Guindon Auditorium 3248</i>) OSCC members, including students
0915 – 0920	OSCC 2014 Annual Scientific Meeting (<i>Roger Guindon Auditorium 3248</i>) Opening Remarks, <i>Dr. Cynthia Balion - OSCC President</i>
Morning Chair	<i>Dr. Matthew Henderson, Clinical Biochemist, The Ottawa Hospital</i>
0920 – 0930	Symposium on data technologies presentation #1- A Brief Introduction to Data Technologies. <i>Dr. Matthew Henderson</i>
0930– 1015	Symposium on data technologies presentation #2- Data Mining the LIS <i>Dr. Christopher Naugler</i>
1015 - 1035	Break (<i>Roger Guindon Atrium</i>)
1035 – 1105	Case presentation #1- Altered methadone pharmacokinetics in obese patients: implications for lipophilic drugs <i>Dr. Bhushan Kapur</i>
1105 – 1150	Symposium on data technologies presentation #3- Audit and feed-back on lab utilization at the Ottawa Hospital <i>Dr. Alan Forster</i>
1150 – 1200	Presentation of 2014 OSCC Awards Outstanding Contributions to the Profession of Clinical Biochemistry in Ontario <ul style="list-style-type: none"> • Dr Viliam Lustig Lifetime Achievement in the Profession of Clinical Chemistry • Dr Matthew McQueen
1200 – 1300	Lunch (<i>Roger Guindon Atrium</i>)
Afternoon Chair	<i>Dr. Nathalie Lepage, Head, Biochemical Genetics laboratory, Children's Hospital of Eastern Ontario</i>
1300 – 1345	Symposium on data technologies presentation #4- BORN Ontario- How does a Maternal Child Registry Help Labs? <i>Dr. Ann Sprague</i>
1345 – 1430	Symposium on data technologies presentation #5- Universal screening for bilirubin <i>Dr JoAnn Harrold</i>
1430 - 1500	Case presentation #2 - Hemoglobin A1c rolling mean – using patient results for quality control in a large volume laboratory <i>Dr. Kika Veljkovic</i>
1500 – 1520	Break (<i>Roger Guindon Atrium</i>)
	Trainee presentations
1520 – 1535	Trainee presentation #1- Jaffe vs Enzymatic Creatinine Measurement on the Architect Platform <i>Dr. Lori Beach</i>
1535 – 1550	Trainee presentation #2- Validation of a beta-human Chorionic Gonadotropin Immunoassay in Cerebrospinal fluid to Monitor Recurrence of Central Nervous System Germ Cell Tumors <i>Dr. Dan Lin</i>
1550 – 1605	Trainee presentation #3- Hemolysis index-based auto-verification in pediatric clinical chemistry testing <i>Dr. Mohamed Abou El Hassan</i>
1605 – 1620	Trainee presentation #4- Therapeutic Drug Monitoring of Mitotane and Associated Metabolites via HPLC: An Evaluation <i>Dr. Dylan Thomas</i>
1620 - 1625	Closing Remarks , <i>Dr. Cynthia Balion - OSCC President</i>



**THANK YOU TO THE OSCC OFFICERS
FOR THE ORGANIZATION OF THE SCIENTIFIC MEETING!**

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TO CLAIM CONTINUOUS EDUCATION CREDITS:

- 1) Each participant will need to record the codes displayed at each session. The code will be shown on the screen at the symposium.
- 2) Enter the claims using the codes, online in the CSCC website www.csc.ca
 - a. If you are an OSCC member, log in and go to "CE code entry" under membership tools. Codes for all category 1 credits can be entered one by one before going to the next step.
 - b. If you are not an OSCC member, go to Conference/Events> Non-Member certificates, enter the codes, and download a certificate attesting to the credits earned.
- 3) We need your feedback on the sessions offered. This feedback, plus suggestions for future topics, is what is used to justify the choice of topics when applying for accreditation in future years. Therefore it is important that you take a few minutes during each session and complete the evaluation forms.



INVITED SPEAKERS

Dr. Mohamed Abou El Hassan, PhD, Fellow-in-Training



Mohamed obtained his PhD in Gene Therapy and Clinical Pharmacology from The Vrije Universiteit, Amsterdam. He performed his first postdoctoral research at the University of Toronto on the influence of epigenetics on Cancer Immunosurveillance. Mohamed worked as Clinical Chemist back home in Egypt for more than 5 years and he is currently a second year fellow at the Clinical Chemistry Program at the University of Toronto.

Hemolysis index-based auto-verification in pediatric clinical chemistry testing

Objectives of presentation.

At the end of the presentation, participants will be able to:

- 1) Understand how we assessed the influence of hemolysis on routine chemistry tests*
- 2) Understand how we standardized the use of hemolysis-index in the auto-verification of test results on different Ortho-Vitros analyzers*



Dr. Lori Beach, PhD, Fellow-in-Training

Dr. Lori Beach is currently in the second of two years in the McMaster Clinical Biochemistry training program in Hamilton. Prior to this fellowship, Lori worked as an associate scientist at Sanofi Pasteur in Toronto in Bioprocess Research and Development, specifically assisting global teams in protein-based vaccine development and preparation of clinical trial material. Her graduate work was conducted at the University of Toronto (PhD) and the University of Guelph (MSc) in biochemistry and genetics, respectively. Outside training, Lori is an avid cyclist, a photographer, and lover of all things musical.

Jaffe vs Enzymatic Creatinine Measurement on the Architect Platform

Objectives of presentation.

At the end of the presentation, participants will be able to:

- 1) Appreciate the differences between Jaffe and Kinetic measurement of creatinine*
- 2) Understand the utility of between-method analysis of the same measurand for possible contribution of imprecision, non-specificity, and effect on other analytes.<*



Dr. Alan Forster, md, FRCPC, M.Sc. , Chief Quality and Performance Officer, The Ottawa Hospital / Senior Scientist, Ottawa Hospital Research Institute, Clinical Epidemiology



Dr Forster is a general internist and Chief Quality and Performance Officer at the Ottawa Hospital. He is a Professor of Medicine at the University of Ottawa and Senior Scientist in the Clinical Epidemiology Program at the Ottawa Hospital Research Institute.

His research focuses on patient safety and quality improvement. He has received several prestigious awards recognizing his work within the field of health services research, including a Career Scientist Award with the Ontario Ministry of Health and Long-Term Care and an Early Research Award and Ontario Research Fund grant from the Ontario Government's Ministry of Research and Innovation.

In addition to his significant contributions to a quality and safety program at the Ottawa Hospital, he provides ongoing scientific advice regarding the measurement of quality of care to national and international organizations, such as the Canadian Institute for Health Information and the World Health Organization. He is currently serving as an Associate Editor of the International Journal for Quality in Healthcare.

Audit and feed-back on lab utilization at the Ottawa Hospital

Objectives of presentation.

At the end of the presentation, participants will be able to:

- 1) Understand opportunities and challenges of using a data warehouse*
- 2) Understand key success factors in reducing MD ordering of lab services*
- 3) Review the Ottawa Hospital practices for audit and feedback.*



Dr JoAnn Harrold, md, Site Chief Neonatology, CHEO and the Ottawa Hospital.



Dr. Harrold is a neonatologist and the site chief for neonatology at both CHEO and the General Campus of The Ottawa Hospital. She led the creation and implementation of a regional guideline for neonatal hyperbilirubinemia and, based on this work, was invited to co-chair the clinical expert advisory group for the provincial quality based procedure on hyperbilirubinemia.

Universal screening for bilirubin

Objectives of presentation.

At the end of the presentation, participants will be able to:

- 1) Appreciate why universal screening for hyperbilirubinemia is needed*
- 2) Understand the tools available to clinicians to guide further testing and treatment*
- 3) Appreciate the difficulties of the screening and care of these children and how / why transcutaneous testing may play a role*



Dr. Matthew Henderson, PhD, FCACB, Clinical Biochemist, The Ottawa Hospital



Dr. Matthew P.A. Henderson received his B.Sc. (Hons) in Biochemistry from Queen's University and his Ph.D. in Biochemistry from McMaster University. He completed his post-doctoral fellowship in Clinical Biochemistry at McMaster followed by a second post-doc in the Genetic and Molecular Epidemiology Laboratory at the Population Health Research Institute in Hamilton.

Dr. Henderson is a clinical biochemist at The Ottawa Hospital and an assistant professor in the Department of Pathology and Laboratory Medicine at the University of Ottawa. He is interested in the application of machine learning and large scale data analysis techniques in clinical biochemistry.

A Brief Introduction to Data Technologies

Objectives of presentation.

At the end of the presentation, participants will be able to:

- 1) Appreciate the benefits of single point of truth in data management*
- 2) Appreciate the benefits of using relational databases in the laboratory*
- 3) Appreciate the distinction between small, medium and large scale data*



Dr. Bhushan Kapur, PhD, FCACB, Division of Clinical Pharmacology and Toxicology, The Hospital for Sick Children



I graduated with a D.Phil. from the University of Basel, Switzerland in 1967. My doctoral thesis supervisor was Prof. Dr. T. Reichstein (Nobel Laureate 1956). I joined the Addiction Research Foundation in 1971 where I was the Director of Laboratories (Clinical Chemistry, Toxicology and Haematology) until May 1995.

Since May 1995, I am with the Division of Clinical Pharmacology and Toxicology, The Hospital for Sick Children in Toronto. In June 2000, I was appointed as a consultant and in the Department of Clinical Pathology, Sunnybrook Health Science Centre and in 2008 a Research Associate in the Sunnybrook Research Institute. From August 2001 to November 2005, I was responsible for the direction of the toxicology laboratory at the St. Michael's Hospital in Toronto. I am Associate Professor in the Department of Laboratory Medicine and Pathobiology, Faculty of Medicine, University of Toronto. I am also Fellow of The Royal Society of Chemistry (UK), Academy of Clinical Biochemistry and Canadian Academy of Clinical Biochemistry. My research interests have been in the biochemical changes in the alcohol and drug using population.

Altered methadone pharmacokinetics in obese patients: implications for lipophilic drugs

Objectives of presentation.

At the end of the presentation, participants will be able to:

- 1) Understand how to calculate half-life*
- 2) Discuss the impact of obesity on disposition of lipophilic medication*
- 3) Understand the obesity epidemic*
- 4) Discuss half-life changes due to drug-drug interactions*



Dr. Dan Lin, PhD, Fellow-in-Training



Dan Lin is currently a second year clinical chemistry fellow at the University of Toronto. He completed his doctoral studies at the University of Toronto in the lab of Dr. Tony Pawson where his research focused on elucidating the molecular mechanisms underlying cell polarity. Prior to beginning his fellowship in clinical chemistry, he was a member of the drug discovery team at the Campbell Family Institute for Breast Cancer Research, developing small-molecule therapeutics directed against novel targets in breast, ovarian and prostate cancers.

Validation of a beta-human Chorionic Gonadotropin Immunoassay in Cerebrospinal fluid to Monitor Recurrence of Central Nervous System Germ Cell Tumors

Objectives of presentation.

At the end of the presentation, participants will be able to:

- 1) *Understand the clinical utility of beta-human chorionic gonadotropin and alpha-fetoprotein measurements in cerebrospinal fluid for monitoring recurrence of central nervous system germ cell tumors in children and young adults.*
- 2) *Appreciate the analytical performance of the beta-hCG and AFP assays on the Abbott Architect in CSF for this purpose.*



Dr. Christopher Naugler, md, Director of General Pathology Residency Program, Calgary Laboratory Services.

Data Mining the LIS

Objectives of presentation.

At the end of the presentation, participants will be able to:

- 1) *Appreciate the range of research that can be conducted with secondary laboratory data*
- 2) *Understand the process of beginning research with LIS data*
- 3) *Understand several recent examples of this (lipids and PSA variation with fasting)*



Dr. Ann Sprague RN., BN, MEd., PhD, BORN Acting Director, Children's Hospital of Eastern Ontario, Ottawa



Dr. Ann Sprague has long been involved in maternal child care and research initiatives at the regional, national and international levels. Ann is currently the Acting Director of BORN Ontario (the Better Outcomes Registry & Network). She has also lead the data analysis and research team at BORN and has been responsible for leading research teams, mentoring students, and developing and evaluating key performance indicators for maternal child care in Ontario. Ann also has a keen interest in privacy related to health databases and the protection of personal health information. In recent years she has obtained grants, led teams and fostered research and published in the clinical areas of H1N1 in pregnancy, hyperbilirubinemia, fetal fibronectin use, late preterm birth, bed rest in pregnancy, second stage of labour, and quality care. She earned her nursing degree (University of New Brunswick), her masters of education (University of Ottawa), her doctorate in nursing (University of Alberta). She has academic appointments at the University of Ottawa and Queen's University in Kingston.

BORN Ontario- How does a Maternal Child Registry Help Labs?

Objectives of presentation.

At the end of the presentation, participants will be able to:

- 1) Describe the purpose of a registry within the context of Ontario*
- 2) Outline the relationship between BORN and labs servicing the maternal-child population*
- 3) Discuss the use of data within the BORN registry for facilitating care, supporting quality improvement and assisting researchers*



Dr. Dylan Thomas, PhD, Fellow-in-Training



Dylan Thomas completed a Bachelor of Medical Laboratory Science and PhD in Pharmaceutical Sciences at the University of British Columbia. After his undergraduate degree, Dylan worked at the Center for Forest Conservation Genetics on identifying small nuclear polymorphisms in Sitka Spruce to track genes that conferred resistance to climate change. After a year and a half of technical work, he began a PhD program within the Faculty of Pharmaceutical Sciences under Dr. Adam Frankel studying protein arginine *N*-methyltransferase (PRMT) enzymology. To date, his research interests largely lie in using mass spectrometry combined with fluorescence techniques to characterize chemical reactions and investigate protein-protein interactions. Dylan began the Clinical Chemistry Postdoctoral Diploma Program at the University of Toronto in July 2013.

Therapeutic Drug Monitoring of Mitotane and Associated Metabolites via HPLC: An Evaluation.

Objectives of presentation.

At the end of the presentation, participants will be able to:

- 1) Appreciate the need for therapeutic drug monitoring of mitotane*
- 2) Assess the performance of our HPLC-UV method*



Dr. Kika Veljkovic, PhD, FCACB, Clinical Biochemist, LifeLabs



Dr. Kika Veljkovic earned her MD from University of Belgrade and her PhD in blood and vasculature research from McMaster University. She is a graduate of the McMaster Postdoctoral Training Program in Clinical Biochemistry.

Kika has published over 20 scientific papers and conference abstracts, including first-author papers in *Blood* and *Clinical Biochemistry*. She has presented her work at numerous national and international conferences, and has received major funding from Canadian Institutes of Health Research and Heart and Stroke Foundation of Canada.

Kika joined LifeLabs as Clinical Biochemist in 2012. Her daily work is focused on routine biochemistry and immunoassays. As all biochemists, she has multiple interests in Quality Management and Quality Improvement, including error detection and mitigation in large volume testing.

Hemoglobin A1c rolling mean – using patient results for quality control in a large volume laboratory

Objectives of presentation.

At the end of the presentation, participants will be able to:

- 1) Understand the principles and purpose of the patient rolling mean (a.k.a. patient moving average) as a form of quality control in clinical laboratories*
- 2) Appreciate steps required and challenges involved in implementation of patient rolling means*
- 3) Learn how patient rolling means can elucidate errors and reduce impact on patient results using an example of hemoglobin A1c rolling mean.*

