CSCC Award for Innovation in Laboratory Medicine

Sponsored by Roche Diagnostics

Laboratory Medicine and Molecular Diagnostics – Division of Clinical Chemistry at Sunnybrook Health Sciences Centre

The CSCC Award for Innovation in Laboratory Medicine is presented to a clinical laboratory in Canada that has distinguished itself by outstanding accomplishment through innovation in the field of clinical chemistry, pathology, or laboratory medicine. The 2024 recipient is Laboratory Medicine and Molecular Diagnostics – Division of Clinical Chemistry at Sunnybrook Health Sciences Centre.

The Sunnybrook team supported work that led to Sunnybrook becoming the first hospital in North America to use two new assays in clinical care to diagnose preeclampsia (PE) in a woman that is pregnant. Clinicians at this hospital now have the latest tools to diagnose PE more accurately and support the hospital's ongoing efforts to bring precision medicine and individualized care to patients. The work began in 2019 and included a multidisciplinary team of specialists from several departments (Obstetrics and Gynecology, Nephrology, Laboratory Medicine) to introduce two completely new assays: soluble fms-like tyrosine kinase 1 (sFLT-1) and placental growth factor (PlGF). Analytical validation included collaboration with the Oxford University Hospitals, as they led the first real world evaluation of these markers to support the current standard of clinical practice in the UK. Sunnybrook also established a well characterized sample bank, including patient diagnoses, that has aided other Canadian labs to establish their local service. This work has enabled Sunnybrook to determine individualized risk of PE for women that are pregnant presenting with elevated blood pressure, based on the sFlt/PlGF ration results. Importantly they showed that this ratio had higher diagnostic accuracy over PlGF alone and with traditional testing for proteinuria.

The project aimed to address three key goals, all of which were met.

- Goal 1: Reduce rate of unnecessary admission to the high-risk obstetrical unit for suspected PE.
- Goal 2: Avoid unnecessary follow-up visits at the outpatient clinical and obstetrical day unit.

- Goal 3: Decrease the risk of missing or delaying the diagnosis of severe PE in women with atypical presentation, and thereby decrease the risk of associated maternal morbidity.

Insight from this information is being shared to colleagues to improve diagnosis and treatment of PE, to reduce morbidity for women and babies, and to improve healthcare system sustainability. Information from this work has been shared at medical grand rounds, professional conferences, and has been included in two published research articles and an invited book chapter. The banked samples have been freely shared with several institutions across Canada, and the Sunnybrook Foundation has also shared the positive impact of this project with the public. In the information sharing with the public, the direct contribution of the clinical chemistry lab to patient care was showcased. The value in being able to avoid unnecessary interventions, alongside helping to find very sick patients, is highly value-add to the health system. This team has truly showed the importance of clinical biochemistry within maternal patient care, and have done so through professional leadership, academic scholarship and exemplary service.

The leadership team for this work includes:

- Dr. Lei Fu
- Ms. Liyan Ma
- Dr. Paul Yip

Additional collaboration was provided by:

- Dr. Nir Melamed
- Dr. Jon Barrett
- Dr. Arthur Zaltz
- Dr. Nanette Okun
- Dr. Michelle Hladunewich

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