Story Angles

25th Annual Rotman Research Institute Conference

March 9 – 11, 2015, Metro Toronto Convention Centre, Toronto

Diagnosing Alzheimer's disease decades before the onset of symptoms – how close are we?

Opening Keynote, Marilyn Albert (Johns Hopkins Medicine, Baltimore),
Monday March 9 @ 9:00 a.m.

One of the world's leading dementia detectives will deliver a progress report on the hunt for early-warning behavioural and biological markers that can pinpoint individuals at greatest risk of developing Alzheimer's, possibly *decades before* the onset of symptoms. Such a breakthrough could have profound implications for pre-clinical treatment success aimed at halting or reversing the devastating disease before it takes hold in the brain.

Rewriting memories: a possible treatment for PTSD?

Elizabeth Phelps (New York University), Wednesday March 11 @ 11:05 a.m.

Dr. Phelps is among a group of pioneering scientists developing new ways to treat post-traumatic stress disorder (PTSD) and addiction. Her research uses an experimental process known as *memory reconsolidation* to help PTSD patients re-learn a traumatic memory without the pain or fear association. The effort to change a memory completely forever has galvanized the scientific community and was the subject of a feature article ("Partial Recall") in *The New Yorker* in 2014.

Using distraction to eliminate forgetting in older adults.

Lynn Hasher (Baycrest's Rotman Research Institute, Toronto), Monday March 9 @ 9:45 a.m.

Older adults have more difficulty with paying attention to relevant information and are more easily distracted by *irrelevant* information – compared to younger adults. But there may be an upside to distraction. Dr. Hasher will share evidence that distraction can serve as a rehearsal device for older adults, actually eliminating forgetting. She will also share evidence that distraction can serve as a learning device, helping older adults to learn the names of new faces. Her lab's research suggests that reduced inhibition (and attendant control over attention) enables a 'broader window' of *encoding* which can, under some circumstances, actually help the cognitive functioning of older adults.

New imaging techniques are changing our approach to tackling Alzheimer's – and offering new hope for prevention.

Sandra Black (Director, Hurvitz Brain Sciences Research Program at Sunnybrook Research Institute, Toronto), Monday March 9 @ 11:15 a.m.

Dr. Black will discuss how neuroimaging markers are being used, both MRI and also amyloid and other molecular PET imaging techniques, to pinpoint Alzheimer's risk a *decade before* onset of symptoms. She will also highlight potentially "game-changing" global trials soon to get underway. The trials will test an experimental anti-amyloid agent on people whose amyloid scans show them to be at high risk for developing Alzheimer's in the next 10 years. If the intervention proves successful, it could mark a major breakthrough in early diagnosis and treatment of this devastating disease.

New research suggests there may be a way to detect conscious awareness in a vegetative patient.

Adrian Owen (University of Western Ontario), Wednesday March 11 @ 9:00 a.m.

Dr. Owen will present findings from a novel approach to detect conscious awareness in seriously brain-injured patients who *may be conscious* but are unable to speak, move or exhibit any other willful behaviour. Dr. Owen says his approach "can determine not only whether any given patient is conscious, but also infer what the contents of that conscious experience might actually be, thus revealing important practical and ethical implications for the patient's standard of care and quality of life." His research has sparked passionate scientific and ethical debate.

Refining and optimizing Deep Brain Stimulation (DBS) to improve remission responses for a greater number of people with severe treatment-resistant depression.

Helen Mayberg (Emory University, Atlanta), Wednesday March 11 @ 9:35 a.m.

Dr. Mayberg is a world expert in tracing brain circuits involved in depression. She will present on the progress being made with subcallosal cingulate white matter (Area 25) *DBS* as a potential therapy for treatment-resistant depression. Dr. Mayberg's lab published results last year that point to a potential new imaging strategy to *refine and optimize* the original target in the brain for stimulation. This approach may lead to more customized surgical targeting and improved remission responses for a greater number of people who receive the therapy.

Although not the focus of her presentation, Dr. Mayberg's lab has also discovered what may be the first *treatment-specific biomarker* in the brain that would help clinicians determine with greater accuracy whether medication or cognitive behavioural therapy will be the most effective treatment for a particular patient. The discovery, if replicated in future studies, could

vastly improve the odds of initial treatment remission. At present, fewer than 40% of patients with major depressive disorder respond to initial treatment.

Why do some older individuals have well-preserved memory and cognition? The answer may help in the design of brain maintenance programs for all of us.

Lars Nyberg, (Umea University, Sweden), Tuesday March 10 @ 2:00 p.m.

"Cognitive reserve" proponents (such as Yaakov Stern) propose that people with higher cognitive reserve, possibly due to lifestyle factors (higher education, profession, exercise, mentally stimulating leisure activities in later life, and other environmental exposure), are better able to cope with pathology in the brain and delay clinical symptoms of dementia. However, Dr. Nyberg will argue that the primary characteristic of successful memory aging is brain *maintenance*, or a relative lack of pathology to begin with. Various genetic and lifestyle factors support brain maintenance in aging, and interventions may be designed to promote maintenance of brain structure and function.