

# Image-Guided Radiation Therapy

## High Precision Radiation Therapy & Management for Brain Tumours



*putting innovation to work*

April 24–26, 2014, Toronto, Canada



Radiation Oncology  
UNIVERSITY OF TORONTO



**IGRT**  
Radiation Medicine Program  
Princess Margaret Cancer Centre



**UHN** Princess  
Margaret  
Cancer Centre

## Multiparametric Imaging of Brain Tumours



Danny Mandell is an assistant professor at the University of Toronto Department of Medical Imaging and a neuroradiologist at the Toronto Western Hospital. He received MD qualifications from McMaster University in 2003, and completed a radiology residency and neuroradiology fellowship at the University of Toronto. He received a PhD from the University of Toronto for his work on magnetic resonance measurement of cerebrovascular reserve.

Imaging is essential for the care of patients with brain tumours. Imaging is used to detect and characterize lesions, establish a differential diagnosis, guide invasive diagnostic tests and therapy, and monitor change over time. This session will provide an introduction to imaging the neuro-oncology patient, with discussion of general imaging approach, imaging technique, tumour characterization, and follow-up imaging.

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## Advances in Brain Tumour Pathology



Rasmus Kiehl is an assistant professor at the University of Toronto, and a staff pathologist at the University Health Network since 2006. He completed his MD qualifications at the University of Lübeck, Germany; his residency in anatomic pathology at Stanford University; and a neuropathology fellowship at Massachusetts General Hospital / Harvard Medical School. His research interests include neuroinflammation and neuro-oncology.

This session will inform the audience about recent changes in the neuropathology of brain tumours. Recent advances in brain tumour genetics, possible changes in the upcoming WHO classification of CNS tumours, opportunities in digital pathology, and similar topics will be explored.

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## Surgical Approaches and Advances for Brain Tumours



Gelareh Zadeh is a surgeon-scientist neurosurgeon at the University Health Network. She earned her MD and PhD from the University of Toronto. Her clinical practice focuses on management of brain tumours. She works with a multidisciplinary team of radiation oncologist, medical neuro-oncologists, radiologist and neuropathologists to provide comprehensive care for patients with brain tumours. One of the key areas of her research and clinical practice focuses on management of patients with brain metastases, using both surgical and radio surgical approaches. Her laboratory research is focused on gaining a better understanding of the molecular regulators of tumour angiogenesis and tumour microenvironment in response to ionizing radiation (IR) in order to improve the therapeutic benefit of radiation therapy for brain tumours.

Many changes are taking place in the multidisciplinary care of brain tumours – both benign and malignant – including in neurosurgery. In this session, recent advances in surgical technology and image guidance including neuronavigation and functional imaging will be highlighted. Specific emphasis will be placed on how these advances have helped improve the extent of tumour resection and functional outcomes for patients.

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