BIO

Dr. Kildea’s background is in astrophysics, having earned his PhD in gamma-ray astronomy at University College Dublin in Ireland in 2003. Before moving into medical physics in 2008, he worked as a postdoc in high-energy astrophysics at McGill University and at the Harvard-Smithsonian Center for Astrophysics. His transition into medical physics started with MSc studies at McGill University in 2008 and finished in 2012 at the end of a two-year residency at the McGill University Health Centre. As a medical physicist, Dr. Kildea’s research interests lie in neutron dosimetry and in quality and safety in radiation oncology with a particular focus on the use of informatics techniques and data mining for quality improvement and comparative-effectiveness research. Dr. Kildea is a strong believer in full patient involvement in healthcare and healthcare research as a catalyst for continuous improvement. At McGill, Dr. Kildea is co-leading the Opal Health Informatics Group with a physician colleague and a patient. Opal (the Oncology portal and application) is mobile phone app and web portal to allow patients direct access to their electronic medical records and to facilitate patient-reported outcomes and data donation for research.

ABSTRACT

In this presentation Dr. Kildea will provide an overview of the two distinct streams of his ongoing research in medical physics at McGill. The Neutron-Induced Carcinogenic Effects (NICE) research group is examining the biophysical effects of secondary neutrons that are produced during radiation therapy. These secondary neutrons deliver an unwanted whole-body radiation dose to the patient that may cause a second radiation-induced cancer. To quantify the second cancer risk, it is necessary to understand both the physical production of neutrons in radiotherapy and the biophysical mechanisms by which neutrons induce DNA mutations. The NICE research group are examining both aspects using a combination of laboratory measurements and Monte Carlo modelling.

The Radiation Oncology Knowledge Sharing (ROKS) research group aims to improve the experience and outcomes of radiation oncology patients through the development of novel software platforms that facilitate the sharing of knowledge and experience. These include: Depdocs - a platform to share guidelines, policies and procedures written by experts, SaILS - a platform to report and learn from adverse events, AHERA - a platform to aggregate and learn from radiation oncology data, and OPAL - a platform to empower patients with their health data and learn from them.

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