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Message from the Guest Editor

Winnie Li, MSc, MRT(T), Research Radiation Therapist[ab]

[a] *Princess Margaret Cancer Centre, Toronto, Ontario, Canada*
[b] *Department of Radiation Oncology, University of Toronto, Toronto, Ontario, Canada*

It is my honour and pleasure to be the guest editor for a very special issue of the *Journal of Medical Imaging and Radiation Sciences*, Image-Guided Therapy.

Over the past decade of my career as a Research Radiation Therapist at Princess Margaret Cancer Centre, I have focused on the application and use of volumetric image-guided radiation therapy. Specifically working with cone-beam computed tomography (CBCT), I contributed to research and development, clinical implementation, and continuing staff education, while ensuring quality control over the entire process trajectory. This experience has been both eventful and insightful—not only does technological advances through imaging improve care to our patients, but it also empowers radiation therapists to make informed decisions, triggers critical analysis, and stimulates inquiry.

It is with my passion for the image guidance process that I write this message. I am amazed by our ability to efficiently image and confidently treat a patient with submillimetre precision using image guidance. The ability to visualise patient positioning and potential patient anatomic changes at the front lines empowers our profession by providing autonomy and engaging an environment of multidisciplinary collaboration. The collection of daily patient positioning information has also led to many technologist-led research endeavours that provides the basis for evidence-based practice.

J Loudon kicks off the issue with a description of how to implement image guidance–related changes into a department. As implementing any change in a department is often associated with many challenges, a standardised approach is promoted by the author.

R Miner provides a clinical perspective into image-guided intracranial neurosurgery. This article describes various ways imaging is used in this setting, from initial diagnosis to planning and treatment and subsequent response monitoring, demonstrating the impact of noninvasive imaging on improving both the outcome and impact on a patient's quality of life. J Abed describes the use of magnetic resonance imaging to improve care to prostate cancer patients. With improved soft tissue visualisation, intraprostatic tumour dose escalation was explored through brachytherapy and external beam linear accelerator treatment. Finally, S Barrett addresses the limitations related to imaging in the presence of breathing motion and explores the feasibility of using four-dimensional imaging routinely in practice.

Routine imaging with CBCT in the clinical environment has led to a plethora of research projects in radiation therapy, well exemplified by several articles in this issue. Collery et al measured the variation in rectal dose between the expected planned and the actual delivered radiation treatment. Chortogiannos et al explored the suitability of bony anatomy and stents as imaging surrogates for pancreatic cancer patients. Goldsworthy et al assessed oropharyngeal patient positioning accuracy through a dual-registration

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methodology. These studies all rely on the availability of daily CBCT images to provide real-time patient positioning information and highlight the increasing importance of imaging in the field. Additionally, as the implementation and use of daily CBCT guidance increases in the community, continuing education needs arise to support technology use. As such, Wong et al explore the perceptions of radiation medicine professionals on an e-learning module as a tool and resource for review of pertinent image guidance concepts.

Treatment planning has also been impacted by advances in imaging. Fitzgerald et al compared three different planning strategies for stereotactic lung radiation therapy delivery, facilitated by data sets acquired under 4D computed tomography to account for patient motion. The ability to improve image quality for accurate target delineation at treatment planning is also very important. In the study by Boudjelal et al, a method to improve positron emission tomography images by reducing artefacts was explored. Efforts to improve target delineation at treatment planning are of optimal importance for accurate dose delivery.

Chan et al explored the impact of transitioning from CT to MR imaging for cervical brachytherapy. This article highlights an impending change in radiation therapy as MR imaging emerges for online soft tissue image guidance. Finally, Jensen et al reviewed the literature on the impact of intensity-modulated radiation therapy over conventional treatment planning practices on patient side effects. This newer treatment technique is facilitated by the availability of computed tomography simulation imaging and robust treatment planning software.

I hope everyone finds the image-guided therapy issue stimulating and inspiring—perhaps, the ideas here will stimulate inquiry within your own daily practice. We look forward to your research submissions for future issues.

Message de la rédactrice en chef invitée

Winnie Li, MSc, MRT(T), Radiothérapeute chercheure[ab]

[a] *Princess Margaret Cancer Centre, Toronto, Ontario, Canada*
[b] *Department of Radiation Oncology, University of Toronto, Toronto, Ontario, Canada*

C'est un honneur et un immense plaisir d'être la rédactrice en chef invitée pour le numéro très spécial du *Journal de l'imagerie médicale et des sciences de la radiation* consacré à la radiothérapie guidée par l'image.

Au cours des dix dernières années de ma carrière comme radiothérapeute chercheure au Princess Margaret Cancer Centre, j'ai concentré mes efforts sur l'application et l'utilisation de la radiothérapie volumétrique guidée par imagerie (RTGI). Travaillant plus spécifiquement avec la tomodensitométrie à faisceau conique (TDMFC), j'ai contribué à la recherche et au développement, à la mise en œuvre clinique et à la formation continue du personnel, et à assurer le contrôle de la qualité sur la trajectoire du processus. Cette expérience a été riche à la fois en événements et en réflexions : les avancées technologiques permises par l'imagerie permettent non seulement d'améliorer les soins donnés à nos patients, mais aussi de faire en sorte que les technologues puissent prendre des décisions éclairées, de lancer des analyses essentielles et de stimuler le questionnement.

C'est avec la passion qui m'anime pour le processus de guidage par l'imagerie que je rédige ce message à propos de l'enjeu de la thérapie guidée par l'imagerie et de l'effet que l'évolution de l'imagerie a eu sur la profession. Je suis