Molly McCulloch

Graduate Student
Morfeus Lab

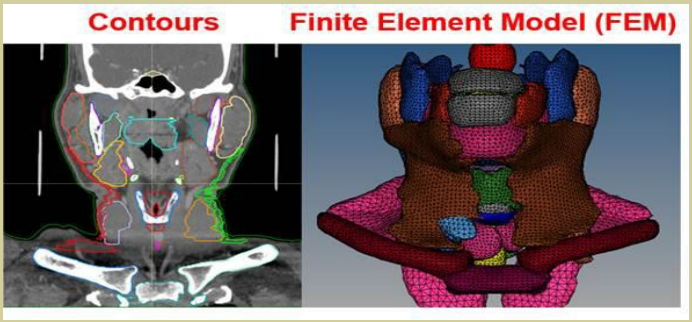
Current Project:

My research focuses on the clinical implications of deviations between planned and delivered dose during radiation therapy.

I develop predictive models to aid in adaptive re-planning for head and neck cancer patients. Additionally, I study the sensitivity of normal tissue complication probability (NTCP) curves, focusing on the differences and potential clinical implications of building NTCP models based on accumulated dose rather than planned dose.

My dissertation also focuses on developing biomechanical models to describe the dose response of the submandibular and parotid glands to spare these glands and increase the accuracy of radiation therapy. This work involves developing optimal boundary conditions in the biomechanical model to account for the varying angles of neck flexion seen between planning, diagnostic, and post- radiation therapy images of head and neck cancer patients.

I have completed similar work, with the goal of accurately mapping the tumors of glioma patients from pre-radiation therapy images to post-radiation therapy images, using a finite element model-based deformable image registration algorithm.



Publication:

M. McCulloch, D. Muenz, M. Schipper, M. Velec, L. Dawson, and K. Brock, “The Impact of Deviations between Accumulated and Planned Dose in Luminal NTCP Models,” published in Advances in Radiation Oncology

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