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*Mapping brain development in childhood using magnetic resonance imaging*

Brain development proceeds rapidly in early childhood and continues through adolescence and into young adulthood. This development is essential for appropriate cognitive and behavioural development, as well as mental health. Magnetic resonance imaging (MRI) provides a non-invasive way to study this development across childhood. Longitudinal neuroimaging in particular is an excellent way to measure brain development over time, providing important information about changes within individuals. My lab uses advanced structural and functional neuroimaging techniques to study typical and atypical brain development from infancy to early adulthood. In this talk, I will highlight some of our work characterizing regional trends of structural brain development in young children, detailing white matter changes in later childhood and adolescence, and determining associations between this development and cognitive and behavioural measures. Specifically, I will showcase the work my lab has been doing to image young children (i.e., 2-6 years), an age that has been traditionally understudied due to practical challenges of neuroimaging in young children (i.e., motion). I will discuss work we are doing in both younger and older children and youth to describe white matter changes in more detail than is provided by the traditional diffusion imaging metrics fractional anisotropy and mean diffusivity. Finally, I will highlight some of the work in my lab linking brain development to reading and pre-reading skills.