



Title: Bone Strength Development in girls and boys with type 1 diabetes Study (BSDS)

Researchers:

Dr. Saija Kontulainen, Nominated Principal Investigator: University of Saskatchewan

Dr. Mark Inman, Co-Applicant: University of Saskatchewan

Dr. James Johnston, Co-Applicant: University of Saskatchewan

Dr. Munier Nour, Co-Applicant: University of Saskatchewan

Dr. Daphne Yau, Co-Applicant: University of Saskatchewan

Research area: Type 1 diabetes

Award: End Diabetes 100 Award, 2021-2024

Summary:

Children with type 1 diabetes have a high risk of fracture but it is unknown why. This study will be the first to study how bone structure, density and strength differs between boys and girls who have type 1 diabetes when compared to boys and girls without type 1 diabetes. This study will also discover if hormones, blood sugar level, body composition or lifestyle factors such as physical activity and diet are related to bone structure and strength in children with type 1 diabetes.

We will recruit girls and boys (8-14 years old) with type 1 diabetes from the Saskatchewan diabetes clinic and Diabetes Canada summer camp for children. We will also measure girls and boys who do not have diabetes to have data for comparison. We will assess bone with very fine details using medical imaging tools safe for children. We will measure growth (height and body mass), record hormones from blood samples taken in the clinic, and monitor nutrition (with a questionnaire) and physical activity (using activity monitors). We will compare bone structure, density and strength between children with diabetes and children who do not have type 1 diabetes. We will assess which measures (like hormones or physical activity) are related to differences in bone structure and strength.

Study findings will inform how and why bone structure and strength differs in children with type 1 diabetes when compared to children who do not have type 1 diabetes. This information will help to improve bone health in children living with type 1 diabetes. For example, research team members, including doctors, scientists and children with diabetes and their families, will use study findings to develop education material about bone health and fracture prevention. Altogether, study findings and related activities with participating children will guide interventions to optimize bone strength development and prevention of bone fragility and fractures in individuals with type 1 diabetes.