

WHAT DOES THE STUDY INVOLVE?

This study is a Canada-wide, longitudinal study. Measurements will occur 1x per year for 4 years. The same activities and measurements will be done at each visit so we can look at changes to muscle and bone that occur as you go through growth and development.

The total time requirement for participation is 2 hours for each study visit. For children with type 1 diabetes, we will do our best to schedule the study visits on the same day as their regular visits to the Diabetes Clinic.

Study visits and measurements will be taken at the Physical Activity Complex (PAC) at the University of Saskatchewan in Saskatoon. Please wear clean athletic clothing and running shoes to your study appointment. Avoid clothing with reflective materials or metal (including buttons, underwire, and clips) as these will obscure images of bones.

Your parent/guardian is welcome to attend and watch the measurement sessions. However, it is not mandatory that they attend the sessions with you. You will always be accompanied by an adult research assistant for the measurement sessions and your parent/guardian can plan to pick you up when the measurement sessions are complete.

Each year, during the study visit, the following testing procedures will be followed.

Testing Procedure:

1. Questionnaires:

- Prior to your study visit, you be asked to complete three questionnaires. These will take about 45 minutes to complete.
 - i. If questionnaires are not completed prior to study visit, you and your parent will be asked to complete them on site. This may result in a longer appointment time.
- Two questionnaires are completed online using REDCap. REDCap (Research Electronic Data Capture) is a secure, web-based software platform designed to support data capture for research studies. Data is hosted at the University of Saskatchewan. Please see the following for more information on the *REDCap Privacy Policy* (<https://projectredcap.org/software/mobile-app/privacypolicy/>).
 - i. Medical History and Limb Dominance: Asks for background information, such as your sex, gender, handedness, fracture history, and medications.
 - ii. Self-Report Physical Activity: Asks about your physical activity in the past seven days and sport participation.
- All participants will be asked to complete a 24-hour food recall using the ASA24 respondent website. Researchers do not provide the ASA24 system with any personally identifiable data for associated with study respondents, nor do the respondents provide any personally identifiable information. Only CanBSDS study investigator(s) and the ASA24 operations team can access response data. Access is gained through usernames and strong passwords. Please see the following for more information on the *ASA24 Respondent Confidentiality Statement* (<https://epi.grants.cancer.gov/asa24/respondent/confidentiality.html>)
If questionnaires are not completed prior to study visit, you and your parent will be asked to complete them on site. This may result in a longer appointment time.

2. Tanner Scale Assessment:
 - Upon arrival at lab, you will be given time to review images in private and circle the image that is closest to representing your current stage of development.
3. Anthropometric Measures:
 - During lab visit, we will measure your weight, height, and sitting height, as well as forearm and lower leg lengths.
4. pQCT Scan:
 - Your dominant forearm and lower leg will be scanned with peripheral quantitative computed tomography (pQCT), a bone and muscle imaging tool. You will sit in a chair with your arm or leg in the machine for 1.5 minutes per scan. Scans do not cause any discomfort. A technician will help to position you comfortably on a chair before taking a total of four scans (two scans/limb). Each scan takes about 90 seconds. You will need to keep still while taking the scan so that a clear image can be obtained, much like when taking a photo. The scan does not feel hot or cause any discomfort for you.
5. HR-pQCT Scans
 - Your dominant forearm and lower leg will be scanned with another scanner called high resolution peripheral quantitative computed tomography (HR-pQCT). This scanner measures fine details of bone we will use to estimate bone strength. You will sit in a chair with your arm or leg in the machine for 3 minutes per scan. There will be 4 scans total. Scans do not cause any discomfort.
6. DXA Scan:
 - Your whole body, lower back and hip will be scanned using a third scanner called dual energy x-ray absorptiometry (DXA). This scanner measures body composition, such as areal bone density, body fat and muscle mass. You will lay on a special bed for all of these scans which will take about 20 minutes. Scans do not cause any discomfort.
7. Hand Grip Strength:
 - Your hand strength will be measured using a special device called a handheld dynamometer. For this test, you will be asked to squeeze the device for 3 seconds. You will be asked to do this 3 times on each hand.
8. Leg Strength:
 - Leg strength will be tested using a long jump test. For this test, you will be asked to jump as far forward as you can. You will be asked to perform this jump three times.
9. Physical Activity Measures:
 - You will be asked to wear a small monitor on your waist for 7 days called an accelerometer. The accelerometer will record your physical activity levels during the week. Use the pre-paid envelope to return the accelerometer and recording sheet after 7 days. This monitor does not cause pain or discomfort.