

# Quantifying Brain Injury on Computed Tomography



QBICt stands for **Q**uantifying **B**rain **I**njury on **C**omputed **T**omography.

## The Problem:

Traumatic brain injury (TBI) is the most common cause of death and disability among children in Canada. Children who are admitted to the hospital with decreased level of consciousness after a TBI require urgent medical attention. Treatment will depend on the type and severity of injury. Currently there is no accurate way to systematically assess TBI based on the commonly used brain imaging techniques. Unfortunately, history and physical findings are often unreliable in the first hours of hospitalization, which is the critical time period in which urgent management decisions must be made.

## The Solution:

We have developed a promising tool for measuring detectable evidence of traumatic brain injury on routine brain scans. The tool combines features invisible to the human eye but detectable by computer software with expert knowledge. We want to evaluate how well our tool can perform in a real health-care setting. We believe it will greatly improve the efficacy and quality of care provided to children after TBI.

## About the study

### What are the goals of this research study

The goals of this study are to assess the severity of brain injury using brain imaging, specifically the CT scan, early after injury by:

1. determining the location of injury in the brain; and
2. using a mathematical technique to quantify the severity of injury based on imaging characteristics

### You/Your child can participate in this study if you/they:

- are less than 18 years of age;
- have experienced a mild, moderate, or severe traumatic brain injury;
- have been admitted to the hospital less than one week after the traumatic brain injury; and
- have had a head CT scan done as part of routine care.

### Benefits for You/your child:

Participants in this study will be provided with a certificate of participation and a written summary of the functional assessment to keep in their records.

### Benefits for society:

This research study will help doctors and researchers across Canada by providing a more specific way to look at TBIs in children. An early understanding of the type and severity of brain injury can help doctors with diagnosis and treatment planning.

## What will Happen?

This research study will ask children who are less than 18 years of age who have experienced a mild, moderate, or severe traumatic brain injury and have been admitted to hospital, to participate.

Children who have undergone a head computed tomography (CT) scan will have their CT images requested for analysis. Children will not undergo another CT scan for this research study.

Follow-up at hospital discharge and 30 and 90 days after the TBI will occur to see how children are

recovering from their injury. Follow-ups can be done in-person or over the telephone.

If there are no contraindications, your child can choose to undergo a brain magnetic resonance imaging (MRI). The results of the MRI report will be put in your child's medical record for the child's doctors to use if needed.

## What is a CT scan?

Computed tomography scan, also known as CT scan or CAT scan, is an important tool for the assessment of patients with traumatic brain injury. The CT scan is a type of x-ray image procedure where a continuous tube with a beam of x-rays rotates while the patient moves through the scanner. During this process a series of pictures are taken that provide a comprehensive view of the brain from different views. The CT scan is the most commonly used imaging technique for diagnosis and to guide treatment decisions.

## Contact Us

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## Partners

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<http://www.cihr-irsc.gc.ca/e/193.html>



<https://www.ccctg.ca/>

## Participating Sites

- The Hospital for Sick Children
- Alberta Children's Hospital and The University of Calgary

## Resources for Families

- <http://www.parachutecanada.org/>
- <http://onf.org/>
- <http://obia.ca/>
- <http://www.sickkids.ca/Research/Neurosciences-and-mental-health/index.html>
- <https://braininjurycanada.ca/>
- <http://concussionsontario.org/>