

# Concussion and Vital Signs Monitoring Wearable Technology

**Status:** Filled

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## Project Description

### **Project Background**

Electroencephalography (EEG) is the measurement of electrical patterns of the brain. Quantitative EEG (qEEG) is the analysis of the digitized EEG. Recent literature indicates qEEG to be promising as a diagnostic assessment for mTBI and post-concussive symptoms. Studies also indicate other brain disorders and diseases such as autism, depression, and Alzheimer could be diagnosed at an early stage by analyzing the brain signals.

In Canada, Ice hockey had the highest reported cases of concussions or other TBIs among males aged 5 to 14 years. New research on the impact of traumatic brain injuries in young athletes shows that abnormal brainwaves and atrophy can persist for two years after a concussion.

A simple portable EEG to be installed inside sport helmets (properioceptively at large) could become an extremely powerful diagnostic tool for assessing concussion at the sideline. Combining this simple to use EEG monitor with other sensors and using sophisticated machine learning techniques to analyze the information could open up a completely new diagnostic area. The ultimate goal is to arrive at an intelligent assessment unit for a concussion just after a head impact. This is something of great need, particularly in youth sports. The technology may also help the concussion aftercare community by monitoring the outcome of their treatments.

### **Project Objectives**