

Title:

Cognitive function and brain blood flow during upright posture in type 2 diabetes

Investigators:

- Dr. Heather Edgell, Principal Investigator, York University
- Olivia Ramraj, PhD student, York University

Description of the Study:

People with type 2 diabetes are at greater risk of developing cognitive dysfunction. This may occur due to altered brain blood flow while standing upright. Due to the effects of gravity, upright posture causes blood to shift away from the brain. Those with type 2 diabetes might have difficulty compensating for these changes and experience reduced blood flow to areas in the brain that are important for cognitive function and motor control. Therefore, these individuals are at higher risk of cognitive decline and fainting resulting in physical injury. This study will measure cognitive function and blood flow through the body while lying down and being upright to determine if reduced brain blood flow in the upright posture correlates with impaired cognitive function. Additionally, this study will investigate the role of cardiac output (the amount of blood exiting the heart with each heartbeat) in supporting brain blood flow and cognitive function in individuals with type 2 diabetes.

Funding Source:

Faculty of Health, York University; Faculty of Graduate Studies, York University

Project Start Date: June 2026

Project End Date: June 2027

Inclusion Criteria:

- Individuals with type 2 diabetes (with or without orthostatic hypotension), and adults with metabolic syndrome.
- Participants must be able to speak and understand English.

Exclusion: serious cardiovascular conditions (i.e. heart attack, heart failure) or cerebrovascular conditions (i.e. stroke), musculoskeletal conditions that would prevent tolerating an upright tilt test for 10 minutes.

Ethics Approval:

York Research Ethics Board Certificate #: e2025-220

Participation:

Participation includes one 2-hour visit. Cognitive function, brain blood flow, heart rate and blood pressure responses to upright posture, will be measured.

Only research personnel will know of an individual's participation. All data will be treated as confidential and use coded identifiers. Information with personal identifiers (i.e. informed consent) will be stored in locked cabinets or encrypted databases. All electronic devices will be password protected or encrypted.

Interested participants who would like to learn more about the study should contact the study team by e-mail: WomensCardiovascularHealth@gmail.com, or leave their contact information at 416-736-2100 ext. 22927

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