

Research Grants 2024

Stroke | Imaging and blood markers in intracerebral haemorrhage: predicting haematoma expansion and clinical outcomes

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This research focusses on a severe type of stroke called intracerebral hemorrhage (ICH), where bleeding occurs in the brain. Current trials are aimed at stopping growth of the bleeding in the early on, in order to prevent death or further damage. This study aims to discover factors that predict worsening of bleeding in the brain and explore new ways to measure brain damage and inflammation after this type of stroke.

The study will look at three main things: 1. Investigate markers seen on brain scans to predict how much bleeding might increase in the first few hours after the stroke; 2. Explore different aspects of bleeding into the spaces of the brain (ventricles) and how they affect a person's recovery; 3. Examine specific substances in the blood related to brain injury and inflammation to understand their role in predicting outcomes after a haemorrhagic stroke.

Researchers will use data from previous studies involving patients with ICH, focusing on those who had brain scans within two hours of their symptoms starting. We will analyse different markers seen on these scans that could indicate worsening bleeding or damage. We will collect blood samples at different times after the stroke to measure certain substances that could provide clues about the severity of brain injury and inflammation. Additional scans will be taken during the hospital stay to assess brain features.

This is a type of stroke with no current effective treatments. ICH has a high death rate and most patients who survive are reliant on others for day-to-day function, therefore, there is a major need to find treatment targets. By understanding factors that predict worsening bleeding and exploring new ways to measure brain damage and inflammation, this research aims to improve outcomes for patients. If successful, this study could lead to better methods for predicting and managing brain bleeding after a stroke, potentially improving chances of recovery for patients.

Grant \$20,000

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Progress Report

These projects leverage off the existing structure of the EVACUATE trial – a randomised trial of minimally invasive surgery (an emerging treatment technique) compared to conservative management. Patients who present within 8 hours of their stroke symptom onset, who present with primary intracerebral haemorrhage are recruited.

Sequential measurements of each biomarker will be taken and tracked at pre-specified timeframes (day 0, day 1, day 3-7, day 14/discharge) and relevant growth trajectories will be described. MRI will be obtained day 3-7 during admission. The association between individual biomarkers, development of perihematomal oedema, association with poor prognostic markers and clinical outcomes of interest will be investigated.

Biomarker study: Ethics approval was submitted to the Royal Melbourne Hospital Human Research Ethics Committee in May 2024, and approval and governance was obtained in late November 2024. After setting up processes with the imaging department and pathology laboratory, recruitment officially began on January 6th 2025. So far, two patients have successfully been recruited and completed all inpatient assessments (MR imaging and laboratory tests). Funding from the RMHNF allows us to enrol 30 patients with ICH to explore the impact of these markers.

Imaging study: EVACUATE-MRI is the imaging only component of this study which all patients with intracerebral haemorrhage are eligible for. The initial patients were funded by the Royal Melbourne Hospital Neuroscience Foundation in 2021. To date, 54 patients have been recruited (of which 30 were recruited in the last 12 months). Of these patients, 48 have completed 3 month follow-up.

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