NIHR | National Institute for Health Research

BRC Stroke and Vascular Dementia Theme

Vision

Our theme currently provides funding to support 16 PIs across several university and clinical departments. Our vision to reduce the clinical burden of stroke and dementia has four key elements:

1. Delay clinical onset by a few years: The number of people aged ≥85 disabled by stroke will treble by 2050 if incidence is not reduced. Neuronal loss in stroke or dementia cannot yet be reversed, but age-related vascular disease can be slowed and end organ damage thereby delayed. A 5-year delay in onset of stroke and dementia in the UK by 2050 would reduce the person-years lived with related disability by 50%.

2. Focus on vascular risk factors: We have no disease-modifying treatments for neurodegeneration, but midlife vascular risk factors are strongly associated with risk of dementia and end-organ damage due to vascular disease is highly amenable to prevention.

3. Address pragmatic clinical questions: Clinical onset can be delayed if earlier recognition of risk and more reliable prognostication leads to more effective use of existing preventive treatments. We aim to improve early recognition of risk using clinical data, brain/vascular imaging, blood biomarkers and remote monitoring of risk factors, and determine the impact of better phenotyping on the effective use of existing treatments.

4. Do reliably powered mechanistic studies: Brain imaging and neuropathology are crucial to understanding mechanisms of cerebrovascular diseases and neurodegeneration, but most studies are underpowered, leading to conflicting results. We will use the large clinical cohorts, biobanks and brain banks that we have established over the last 20 years to do studies that are powered to answer questions reliably.

Platforms and resources

Our vascular research capacity and our unique clinical cohorts and biobanks.

Centre for the Prevention of Stroke and Dementia: The centre has 40 staff and provides clinical, statistical and lab support for various BRC and other studies.

Oxford Vascular Study: *OxVasc is* a population-based study of all vascular events in about 92,000 residents registered with 100 local GPs. Patients are followed-up to 10 years, providing detailed clinical data, biobanking, state-of-the-art brain/vascular imaging, detailed physiological studies, remote home-monitoring of risk factors and early-phase clinical trials.

Acute Vascular Imaging Centre**:** AVIC is a £15 million imaging research facility that provides 3T MRI and angiographic facilities for high-quality brain/vascular imaging. Located at the heart of the JRH, it allows research on patients in the acute setting, whilst ensuring high quality clinical care.

Collaborative analyses of multiple randomized trials: The theme is responsible for three large data pooling projects based on multiple large randomized trials, each about to add substantial new data: Blood Pressure Lowering Treatment Trialists Collaboration (BPLTC); Non-Vascular Outcomes on Aspirin (NOVA) Collaboration; and Carotid Endarterectomy Trialists' Collaboration (CETC).

Dementia Cohorts and biobanks: three major resources underpin our work on vascular dementia.

i) The *Oxford Project to Investigate Memory and Ageing (OPTIMA)* cohorts together with *Brains for Dementia Research Study* have 1300 subjects with cognitive impairment, with detailed clinical assessments, imaging (CT/MRI/SPECT), 5-20 yr follow-up (with repeat imaging), extensive biobanks, and >700 donated brains;

iI) The MRC-funded *Oxford Brain Bank* is a major collaborative neuropathology platform for tissue research, developing innovative high-throughput quantitative methods to inform neuropathological typing of 10,000 brains from UK Biobank;

iii) Over 3,000 OxVasc recruits with TIA/stroke have cognitive decline and related symptoms (e.g. fatigue, gait impairment, depression, delirium) assessed on follow-up.