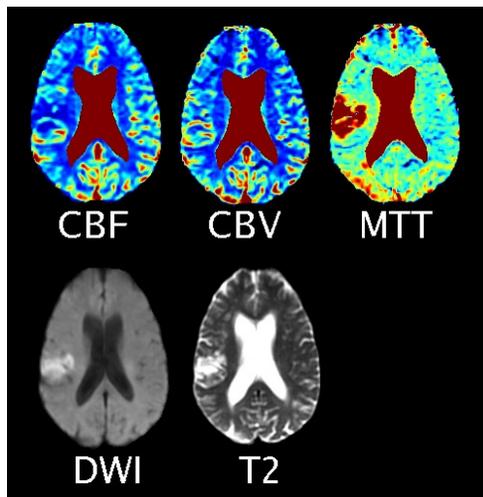


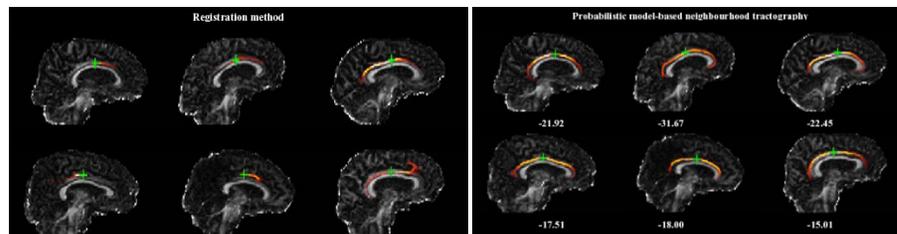
## Perfusion Imaging in Stroke

These images were taken as part of an acute imaging study in stroke, led by Prof Joanna Wardlaw, using analysis methods developed by Drs Trevor Carpenter and Paul Armitage. They show the disruption in blood flow in a patient with a partial right hemisphere middle cerebral artery infarction (top row) and the effect this has on the surrounding brain tissue (bottom row).



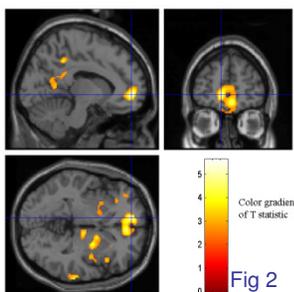
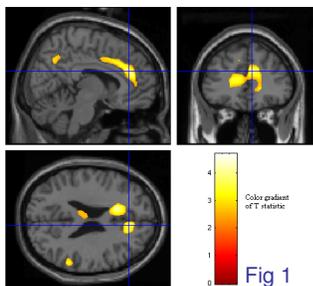
## Tractography in the Ageing Brain

Changes in white matter are being increasingly investigated and methods to allow the automatic identification of white matter tracts are being developed. In six subjects aged between 70-80 years of age, the right cingulum cingulate gyrus was segmented using registration techniques, which produce highly variable segmentations of the tract in question (left), and probabilistic neighbourhood tractography (PNT) - a method developed by Drs Mark Bastin and Jon Clayden - that significantly reduces this variability (right). PNT is currently being used in the Help The Aged funded Disconnected Mind project which aims to understand how white matter structure relates to cognitive ageing in the Lothian Birth Cohort 1936.



## Genes in Schizophrenia

Catechol-O-Methyl Transferase (COMT) is one of the most biologically plausible genes associated with risk of schizophrenia but its cerebral mechanisms are poorly understood. In a study of people at high risk of schizophrenia, led by Prof Eve Johnstone, those currently well people carrying the risk allele at the COMT Val158Met locus developed schizophrenia at a significantly greater rate than those without the risk allele. Furthermore, the risk allele was associated with structural (Fig 1) and functional (Fig 2) abnormalities of the anterior cingulate and medial prefrontal cortex, areas commonly associated with schizophrenia.



## Lacunar Stroke Imaging

The "leakiness" of the blood brain barrier was assessed in patients with lacunar stroke, in a study led by Prof Joanna Wardlaw, using a multi-modal approach: a) DWI, b) T<sub>2</sub>-weighted, c) FLAIR without contrast at initial diagnosis (the acute infarct is visible in the posterior limb of right internal capsule (white spot in a)) and d) FLAIR with contrast six weeks later. In d, high signal from the contrast agent is present in the CSF in the sulci (arrows) and some enlarged perivascular spaces (thick arrow), not seen in c, and suggests that patients with lacunar stroke have subtle and diffuse abnormalities in the blood brain barrier.

