

# **Imaging perfusion deficits, arterial patency and thrombolysis safety and efficacy in acute ischaemic stroke. An observational study of the effect of advanced imaging methods in The Third International Stroke Trial (IST-3), a randomised controlled trial**

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## **Plain English summary**

### **The Third International Stroke Trial (IST-3)**

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## Plain English summary

Stroke is a devastating disease with few effective treatments. Most instances of stroke are due to a blood vessel to the brain becoming blocked; thrombolytic ('clot busting') drugs reduce disability if given quickly after stroke, but may cause brain bleeding which worsens outcome. Better ways to identify those who may benefit or be harmed by thrombolysis might increase use of this important treatment and improve outcomes after stroke. Scanning of brain blood flow and blocked arteries with computed tomography (CT) or magnetic resonance (MR) perfusion or angiography imaging might help to pick out patients for treatment.

The Third International Stroke Trial (IST-3) aimed to find out which patients benefited most from thrombolysis. The IST-3 trial centres performed perfusion or angiography on about 400 patients. More patients received angiography than perfusion imaging and CT than MR. Slightly fewer than half of the patients had reduced blood flow to the brain or a blocked artery. Having a perfusion abnormality or blocked artery led to a worse stroke, more disability and death by 6 months after stroke. Thrombolysis unblocked the arteries faster. However, all patients benefited from recombinant tissue plasminogen activator, whether or not they had reduced blood flow or blocked artery visible on their scan.

We conclude that neither perfusion nor angiography imaging are needed at present for routine assessment of stroke patients before thrombolysis. This will save time, reduce costs, avoid radiation and X-ray dye, and improve outcome after a stroke. Perfusion and angiography imaging might improve doctors' confidence in diagnosing stroke; we will be testing this in a new trial.

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