Acute ischemic stroke: extending the time window

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The general strategies which may be adopted to salvage brain tissue at later time periods include:

1. Further enhancing recanalization and reperfusion within the life of the penumbra using intravenous and intra-arterial thrombolytic agents, combined routes, newer thrombolytic and antiplatelet agents as well as devices to improve revascularisation.

2. Selecting patients based on imaging techniques. This allows patients with persistent penumbra to be selected such as with the EPITHET trial using tPA within 3–6 hour time window, DIAS and DEDAS using desmoteplase with a 3–9 hour time window.

3. Freezing or prolonging the penumbra using neuroprotectants. Trials in which neuroprotectants alone have been used such as the recently reported NXY-059 studies have been disappointing. A new approach to neuroprotection is required in which reperfusion is an essential part of the study design.

By extending the time window for therapy, the number of patients available for therapeutic intervention will be greater, thus making acute therapies more generalisable and more likely to have an impact on reducing the burden of stroke.