Stroke treatment

Traditional view:
- CNS is inflexible circuit with fixed neurological pathways
- Aim: to establish compensation and unilateral activity

Current view:
- During CNS maturation after birth, extensive remodelling takes place
- Lifelong synaptic connections between two cells & multi-cellular dendritic connections

- Consistency & repetition in experience can influence long-standing changes (Richards et al, 2008)
- Changes can occur on the primary-motor areas as well as the sensory-motor areas (Richards et al, 2008)
- Functional activation patterns within affected primary sensory-motor cortex depends on the integrity of the cortico-spinal tract (Hamzei et al 2008)

Post-lesion changes:

- a pre-synaptic loss of the uptake mechanism for neurotransmitter substance in the synaptic cleft, leaving too much neurotransmitter substance in the synaptic cleft, causing a heightened response to stimulation (for the 1st days following lesion
  -→ CNS becomes supersensitive to transmitters - may result in hyperreflexia

- Specific synaptic connections are linked to establish new functional pathways
  - Non-specific: cells establish contact to stop other cells from dying from lack of communication
  - Without adequate stimulation, neurones die

"Denervation supersensitivity"

"Sprouting"

- Cells have the ability to regenerate axons / dendrites in areas of the spinal cord
- New axons are of poorer quality but may reach their target cell within 1 year

"Regeneration"

"Unmasking of Latent synapses"