

# When the brain's 'junction box' misfires

**Parkinson's disease** – the neurological disorder that causes muscle tremor, muscular rigidity and weakness – affects one in 200 of the elderly population. It is caused by the mysterious death of nerve cells deep in the brain, which send vital messages to the spinal cord, nerves and muscles

## Voluntary movement:

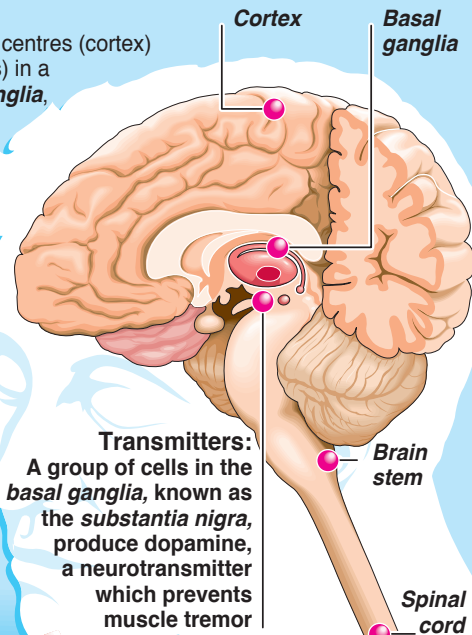
Impulses from the brain's thought centres (cortex) pass through nerve cells (neurons) in a 'junction box' called the **basal ganglia**, then travel via the brain stem and spinal cord to peripheral nerves which control the muscles

**Neuron:** Dozens of root-like dendrites receive incoming messages from other neurons

**Dendrite**



**Axon:** Electrical impulse travels along axon to synapse – area of contact with next nerve cell



**Transmitters:** A group of cells in the **basal ganglia**, known as the **substantia nigra**, produce dopamine, a neurotransmitter which prevents muscle tremor

**Synapse:** Electrical impulse triggers release of neurotransmitters

**Receptor**

**Parkinson's disease:** Dopamine producing cells die – excess acetylcholine causes muscular tremor

**Dopamine:** Transmitter binds with receptors on surface of next nerve cell in chain, passing message along nerves to dampen muscle activity. A second neurotransmitter, acetylcholine, inhibits dopamine and stimulates muscle contraction