

Parkinson's and Huntington's Disease

Things to learn from neurodegenerative diseases

A Tea Talk
by Kristin Völk, 30.01.2014

Motivation

- Both are neurodegenerative diseases which **disrupt normal motor behaviour**
- Can we **understand the cause** of the characteristic motor symptoms?
- What can we learn from this about **normal motor control**?

Symptoms

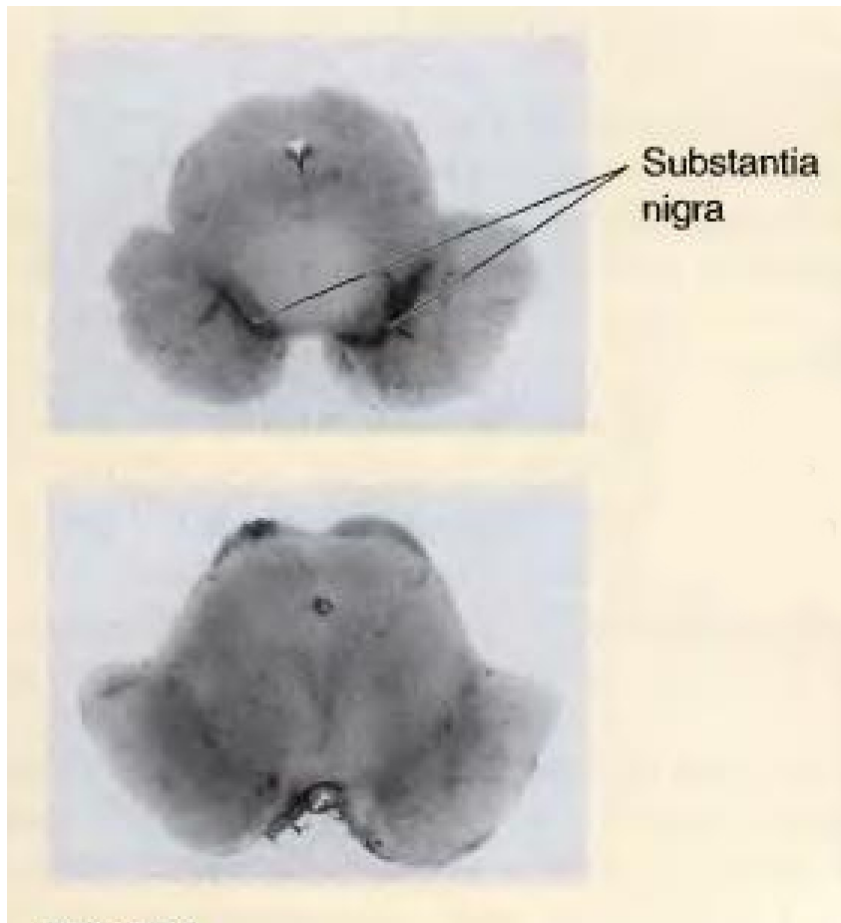
Parkinson's

- Hypokinesia (paucity of movement)
- Slowness of movement
- **Difficulty initiating willed movements**
- Increase in muscle tone (rigidity)
- Tremors

Huntington's

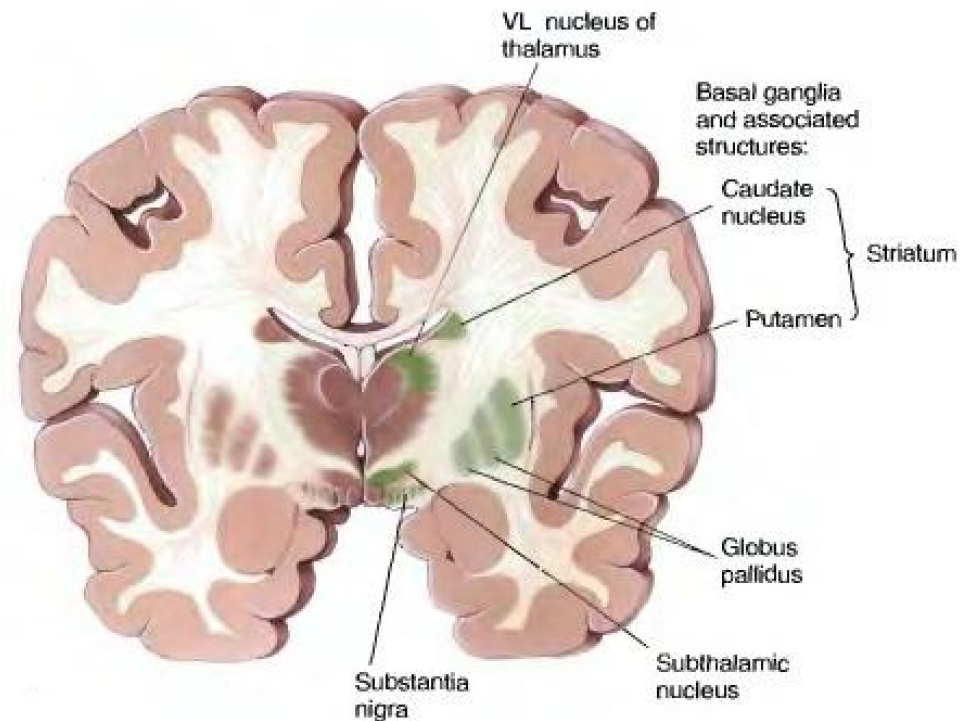
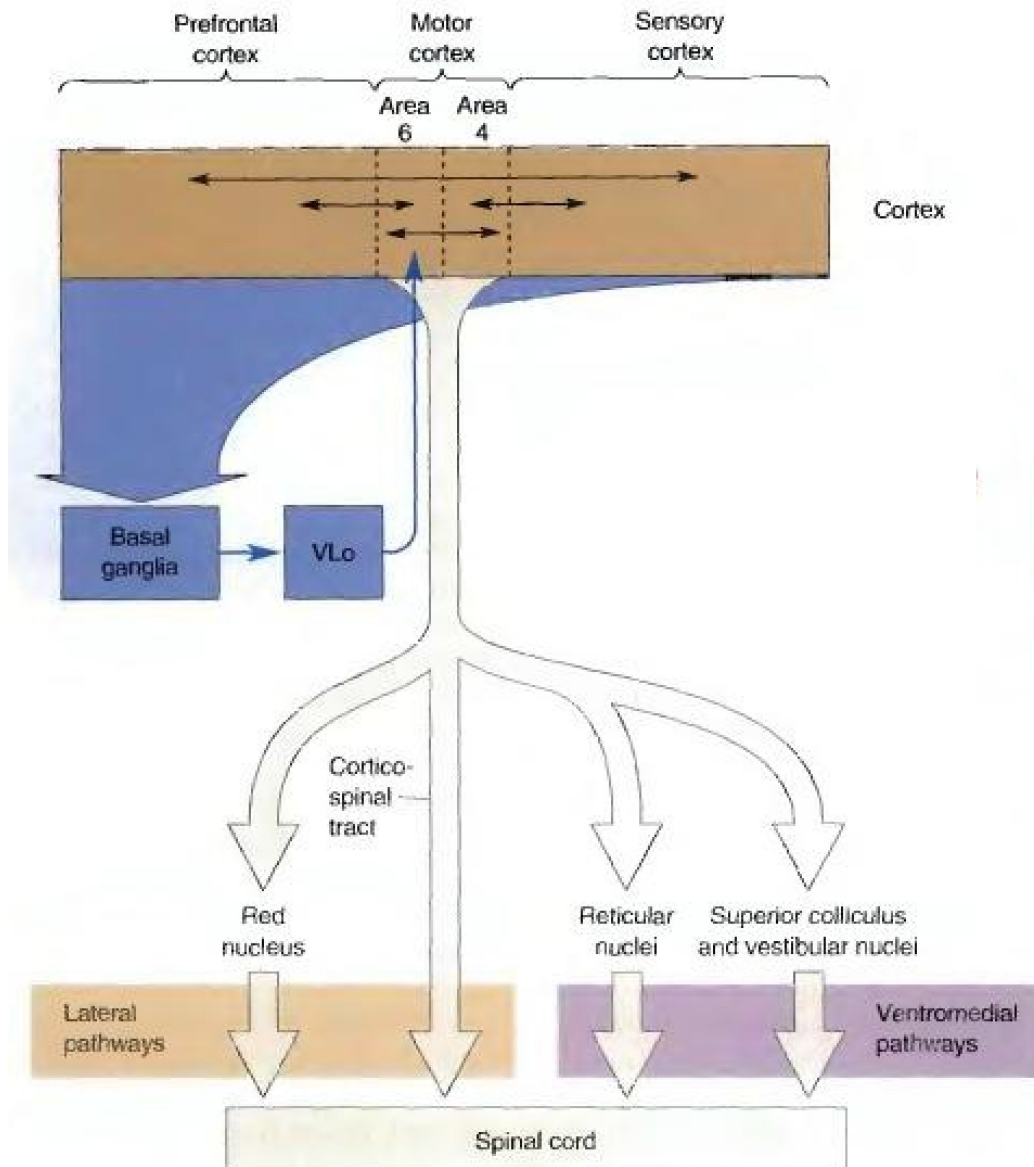
- Hyperkinesia (excess of movement)
- **Involuntary movements**, which are quick irregular but coordinated

The Pathology

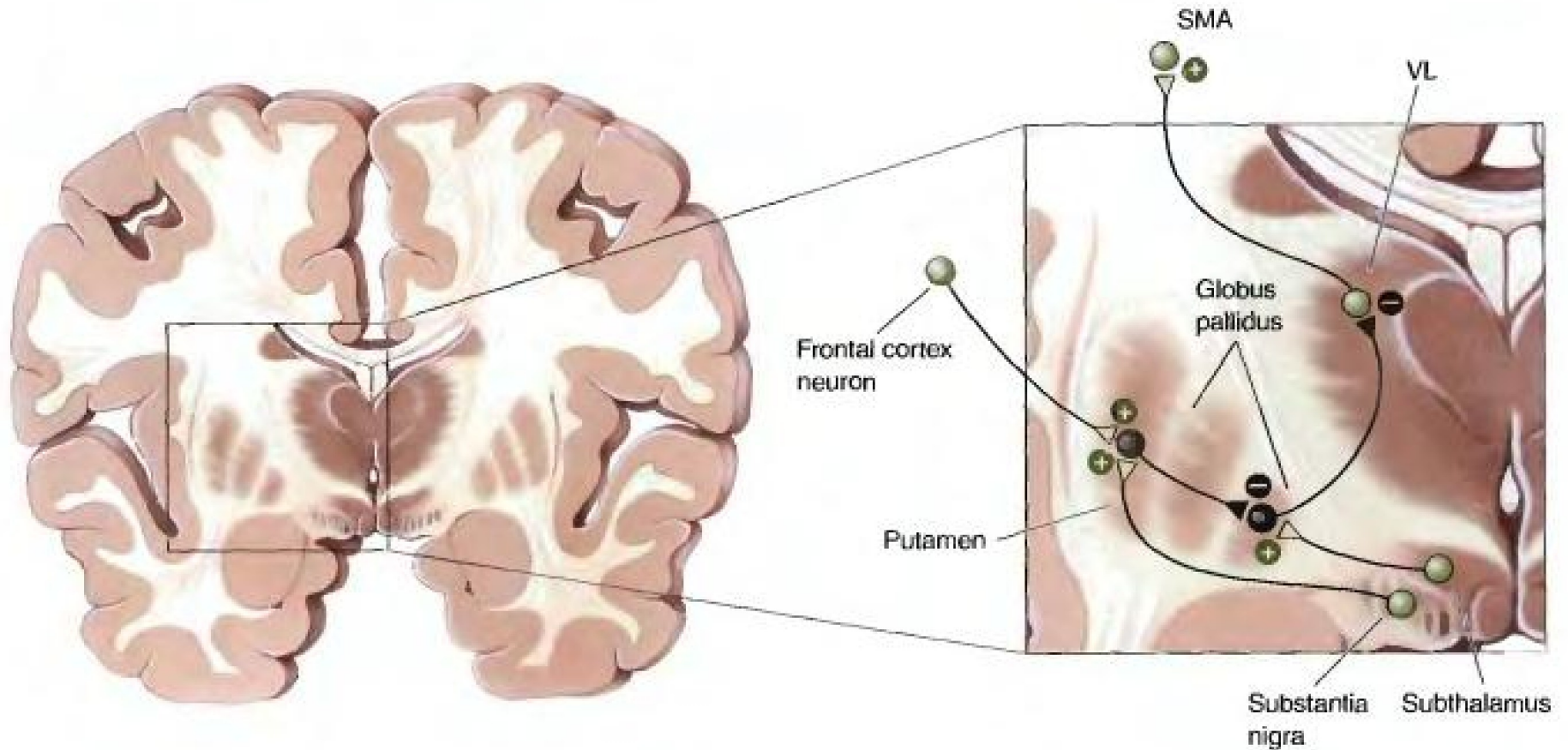


Finding the Cause

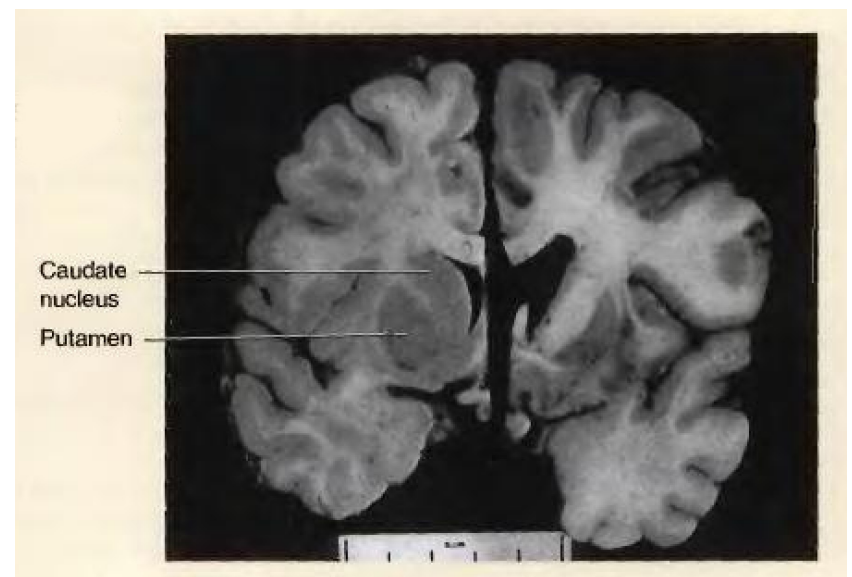
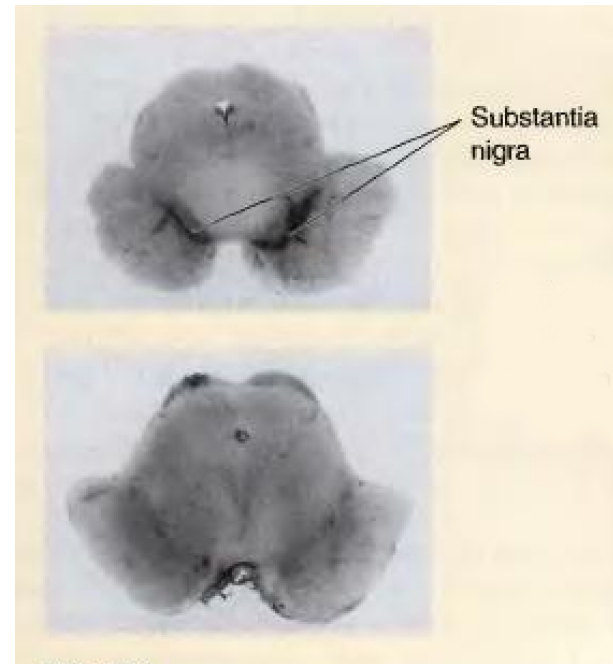
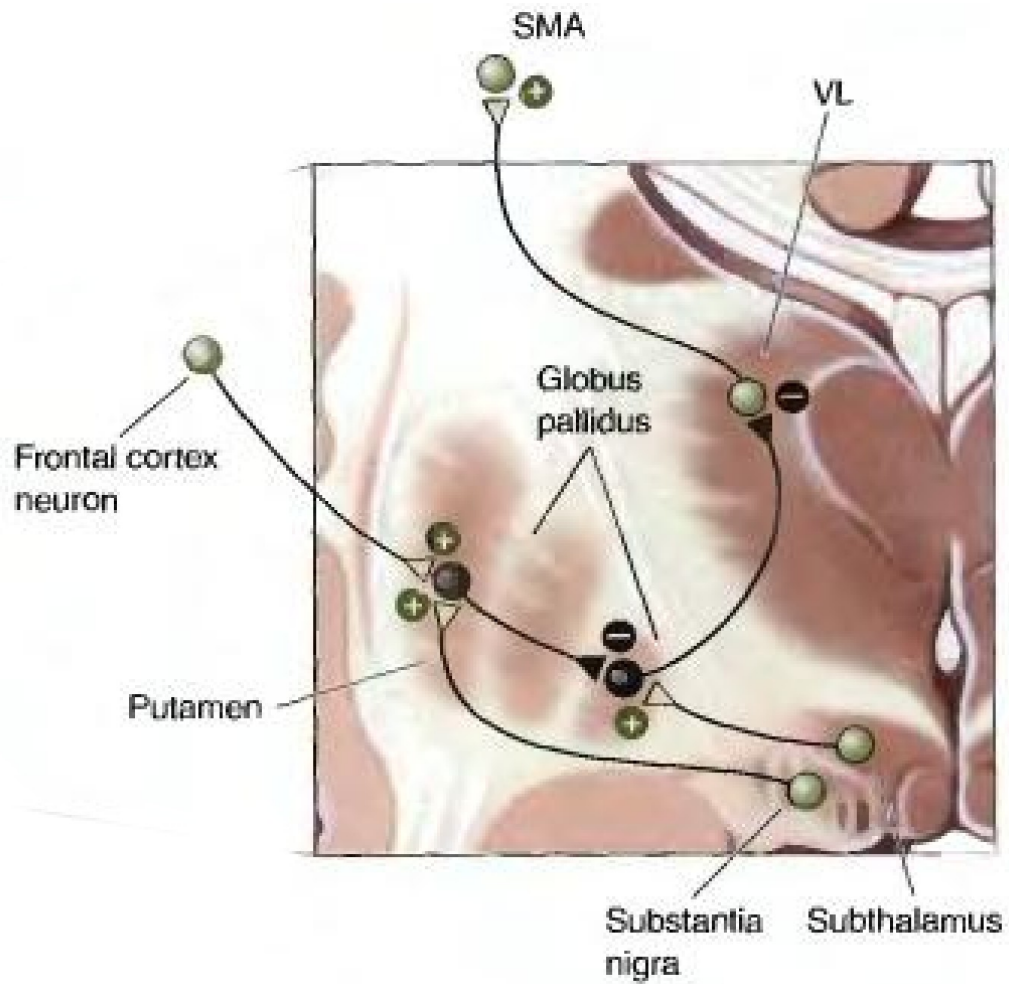
The Basal Ganglia



The Motor Loop



Neurodegeneration



Treatment of Symptoms

Parkinson's

- Cell death of dopaminergic neurons in substantia nigra
 - Failure to excite striatum
 - Failure to excite SMA
- Treatment with dopamine agonist / or L-dopa (dopamine precursor)

Huntington's

- Cell death of striatum and pallidus cells
 - lose of inhibition on thalamus (VL)
 - over activation of SMA
- Treatment with dopamine antagonist

Conclusion

- The pathological brain can be instructive
- Basal ganglia involved in generation of willed movement
- Basal ganglia degeneration disrupts voluntary movement