Descending Pathways

- Pyramidal system
- Extrapyramidal system
  - basal ganglia
  - red nucleus
  - subthalamic nuclei
  - substantia nigra
  - reticular formation
  - vestibulo-spinal?
  - tecto-spinal?
  - cerebellum?
Pyramidal Tracts

Pyramidal cells in the primary motor cortex

A major tract in primates
Larger than its function
Mainly for fine motor control

Homunculus in primary motor cortex

From cortex (only 40% from primary motor cortex)
Passes through the posterior limb of the internal capsule in somatotopic order
Passes through cerebral peduncles
Sends branches off to bulbar nuclei (both ipsi and contra)
At pyramids 85% cross midline

Damage effects not as bad as might be expected from its size
Myelinated Fibres Can be seen clearly

Cranial Motor Nuclei
Reflexes

Upper and Lower Motor Neurones

- A clinically useful term, not really an anatomical term.

**UMN**
- disinhibition
- hyper-reflexia
- spasticity
- clonus
- paresis or paralysis

**LMN**
- hypo-reflexia or areflexia
- fibrillation
- muscle wasting
- hypotonia
- paresis or paralysis
Extra-pyramidal tracts

- Tegmento-spinal (7)
- Rubro-spinal (8)
- Medial long.
- Fasc. (10)
- Tecto-spinal (9)
- Reticulo-spinal (6, 5)
- Vestibulo-spinal (4)
Vestibulo-spinal

- To cervical levels
- Important for balance
“Striatum”

- Caudate
- Putamen
- Globus pallidus

Basal ganglia = striatum + amygdala (+claustrum?)

Lenticular nucleus = Globus pallidus + putamen

Involved in feedback loops
Cerebellar Movement Disorders

- Dysmetria - over-reaching (test by touching your nose) DISTANCE
- Disdiadochokinesia - disjointed movement, poor timing (touch fingers in order) TIMING
- Dyssynergia - disjointed force (touch examiner’s finger) FORCE
- Ataxia - poor coordination (all the above)
- Clonus - contraction in response to stretch
- Paresis - weakness, partial paralysis
Basal ganglia problems

- Involuntary movement at rest
- Hypokinesia
- A “mask” like face
- Rigidity

- Typical of Parkinson’s disease
- Treated by L-Dopa
- Experimentally by foetal grafts
- Caudate lesions