



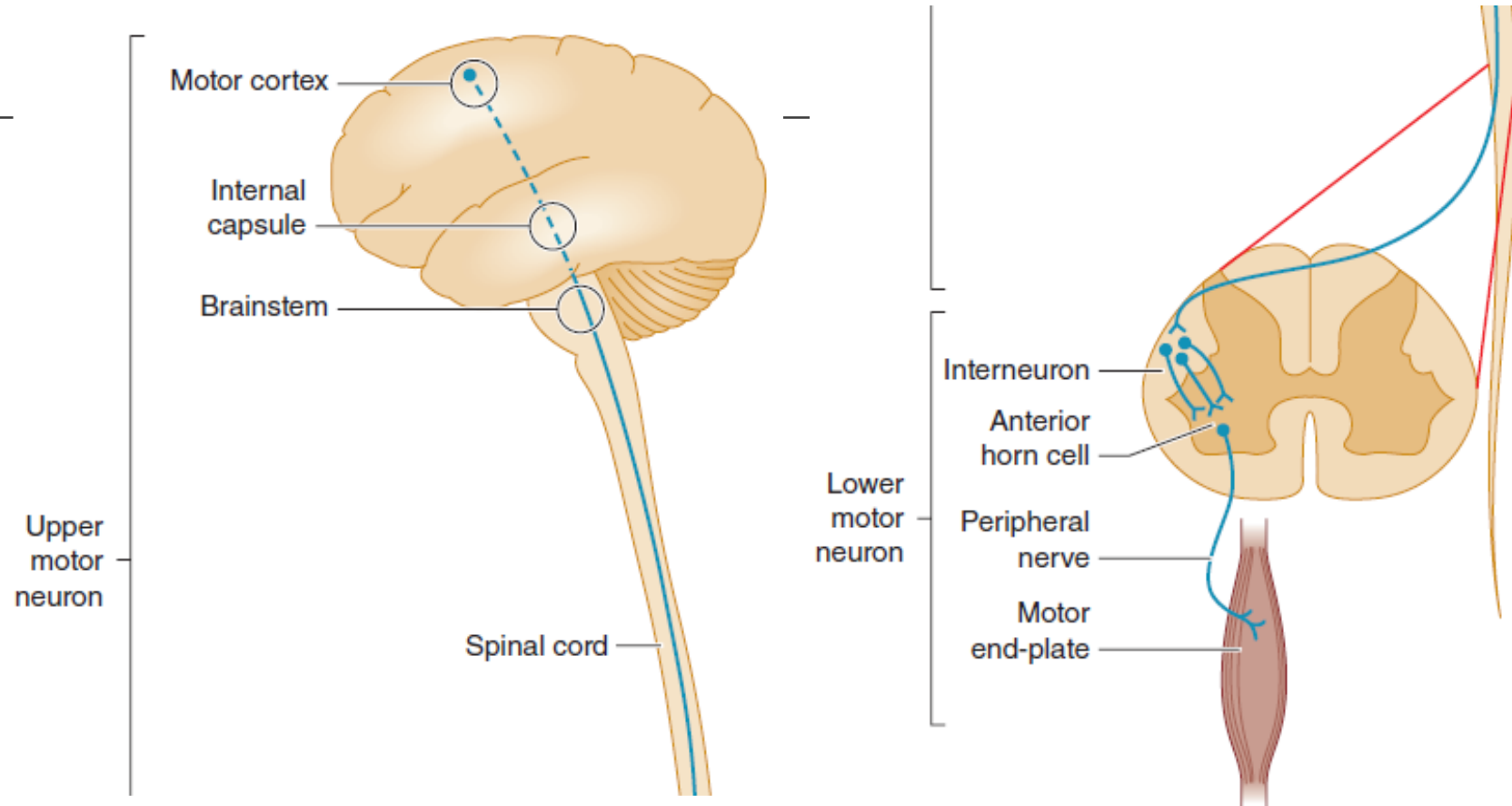
Neurology II-4

Motor Dysfunction

MOTOR DISORDERS

Normal motor function depends on the transmission of signals from the brain to the brainstem or spinal cord by **upper motor neurons**, and from there to skeletal muscle by **lower motor neurons**.

Anatomic basis
of the upper
motor neuron
and lower motor
neuron concepts.



History

Mode of Onset

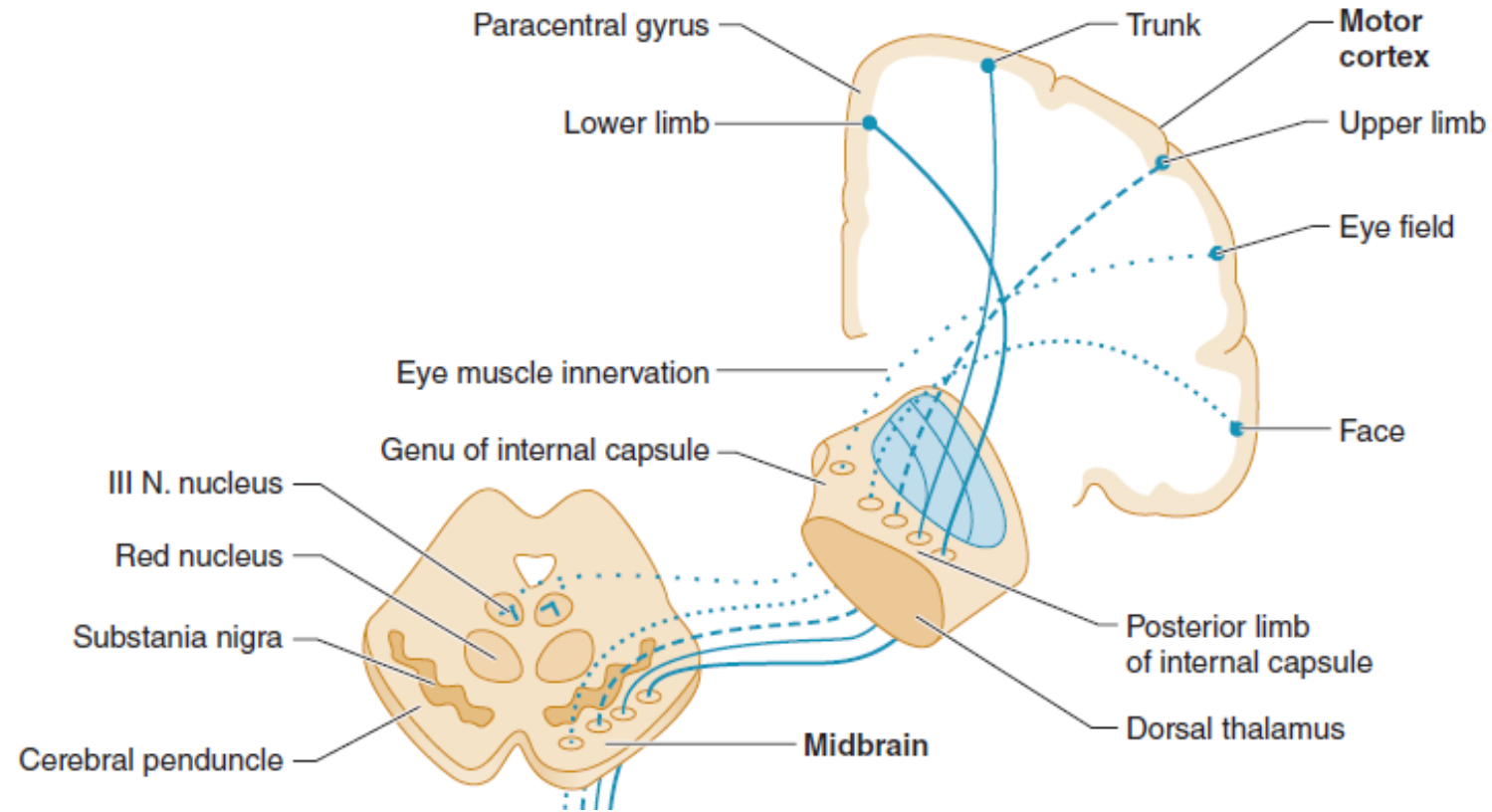
Course

Distribution of Symptoms

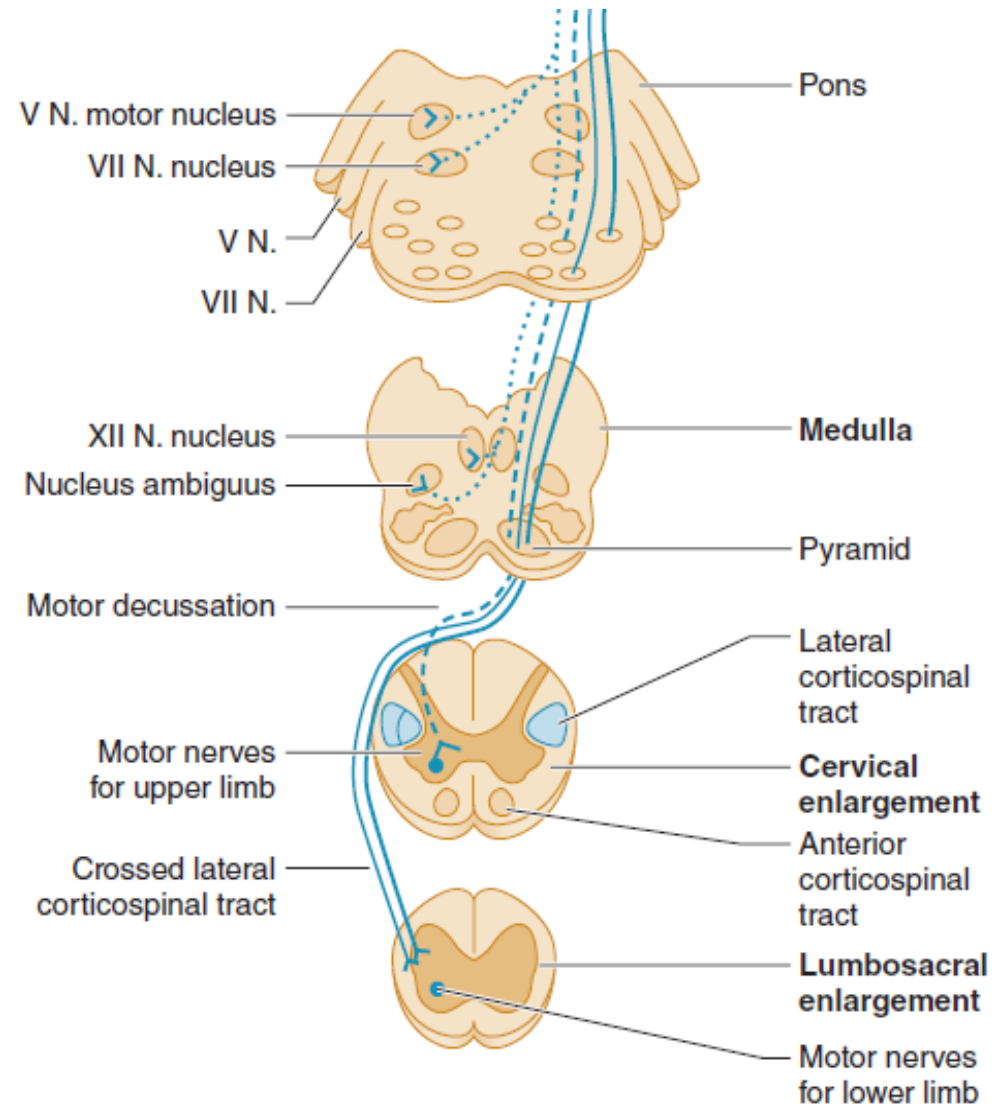
Associated Symptoms

Severity of Symptoms

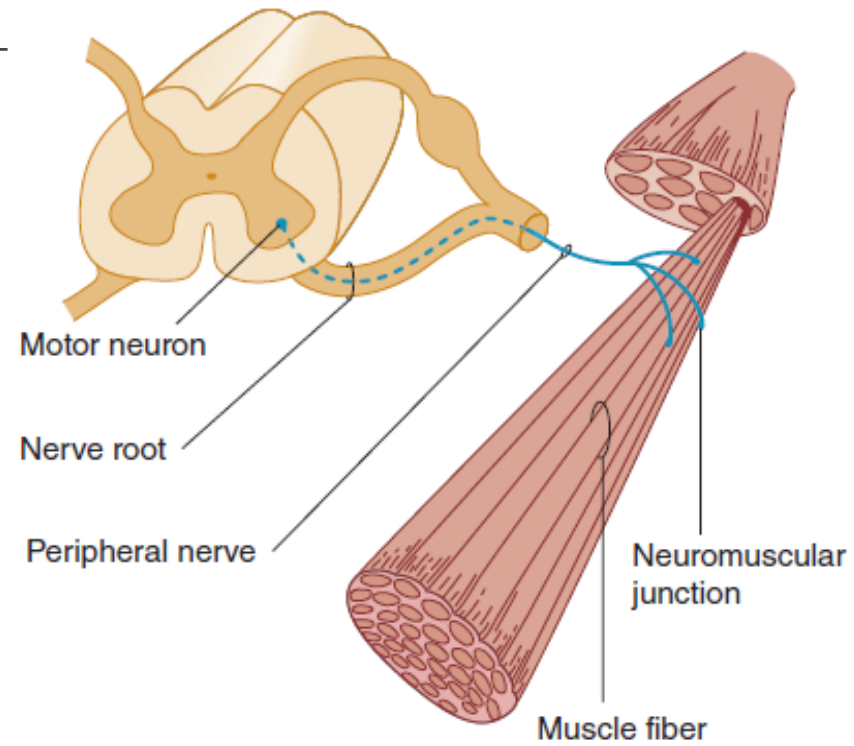
Upper
motor
neuron
pathways.



Upper motor
neuron
pathways.
Tracts at
bottom left are
shown outside
the cord for
clarity only.



Anatomic
components of
the motor unit.



Some Causes
of Weakness
of Acute or
Subacute
Onset.

Supraspinal lesions
Stroke Other structural lesions
Spinal cord lesions
Infective: human Immunodeficiency virus (HIV) Infection Inflammatory: transverse myelitis, multiple sclerosis Compressive: tumor, disk protrusion, abscess Vascular: Infarction, hematomyelia
Anterior horn cell disorders
Poliovirus, coxsackievirus, West Nile virus infection
Peripheral nerve disorders
Guillain-Barré syndrome Diphtheria Paralytic shellfish poisoning Porphyria Arsenic poisoning Organophosphate toxicity
Neuromuscular junction disorders
Myasthenia gravis Botulism Aminoglycoside toxicity
Muscle disorders
Necrotizing myopathies Acute hypo- or hyperkalemia Periodic paralyses

Motor
Disorders
Associated
With Drugs.

Drugs that cause motor (or predominantly motor) peripheral neuropathy ¹	
Dapsone Imipramine Sulfonamides (some)	
Drugs that can impair neuromuscular transmission	
ACTH Aminoglycoside antibiotics β -Blockers Chloroquine Colistin Corticosteroids Lithium Magnesium-containing cathartics	Penicillamine Phenothiazines Phenytoin Polymyxin Procainamide Quinidine, quinine Tetracycline
Drugs associated with myopathy	
β -Blockers Chloroquine Clofibrate Corticosteroids Drugs causing hypokalemia Emetine	ϵ -Aminocaproic acid HMG-CoA reductase inhibitors Penicillamine Zidovudine

Past Medical History

Developmental History

Family History

Neurologic Examination

Motor System

Muscle Appearance

Muscle Tone

Muscle Power

Grading of
Muscle Power
According to
the System
Suggested by
the Medical
Research
Council.

Grade	Muscle Power
5	Normal power
4	Active movement against resistance and gravity
3	Active movement against gravity but not resistance
2	Active movement possible only with gravity eliminated
1	Flicker or trace of contraction
0	No contraction

Tendon Reflexes

Changes in the tendon (muscle stretch) reflexes may accompany disturbances in motor or sensory function and provide a guide to the cause of any motor deficit.

1. Areflexia
2. Hyperreflexia
3. Reflex asymmetry

Tendon
(Muscle
Stretch)
Reflexes

Reflex	Segmental Innervation	Nerve
Jaw	Pons	Mandibular branch, trigeminal
Biceps	C5, C6	Musculocutaneous
Brachioradialis	C5, C6	Radial
Triceps	C7, C8	Radial
Finger	C8, T1	Median
Knee (patellar)	L3, L4	Femoral
Ankle (Achilles)	S1, S2	Tibial

Coordination

The coordination of motor activity can be impaired by weakness, sensory disturbances, or cerebellar disease and requires careful evaluation.

Voluntary activity is observed with regard to its accuracy, velocity, range, and regularity, and the manner in which individual actions are integrated to produce a smooth complex movement.

Superficial Reflexes

1. The polysynaptic superficial abdominal reflexes
2. The cremasteric reflex
3. Stimulation of the lateral border of the foot ,The **Babinski response**

Gait

1. Apraxic gait
2. Corticospinal lesions
3. Frontal disorders
4. Extraparamidal disorders
5. Cerebellar disorders
6. Vestibular disorders

7. Impaired sensation

8. Anterior horn cell, peripheral motor nerve, or skeletal muscle disorders

9. Unsteady or cautious gait in the elderly

10. Psychogenic gait disorder