

<u>UMN Lesion</u>	<u>LMN lesion</u>
Increased tone	Wasting and fasciculation
Spasticity	Decreased tone
Weakness	Weakness
Brisk reflexes, extensor plantar response	Reduced reflexes

Proximal weakness

CONGENITAL MIND → normal sensation

- **Congenital** - mitochondrial
- **Metabolic** - Cushing's disease, hypothyroidism
- **Inflammatory** - dermatopolymyositis, inclusion body myositis
- **Neuromuscular** - myasthenia gravis, Lambert–Eaton myasthenic syndrome
- **Dystrophies** - Becker's, FSHD, limb girdle

Bilateral UMN (pyramidal weakness)

3M's

- **MS**
- **MND** → normal sensation
- **Myelopathy** - SOL, cervical myelopathy, disc prolapse, trauma, transverse myelitis, syringomyelia, congenital
↳ sensory level
- **Others** - brainstem stroke, hereditary spastic paraplegia

Unilateral UMN (pyramidal weakness)

Work down (brain to cord)

- **Intracranial** - CVA, SOL, MS → hemisensory loss
- **Brainstem** - MS
- **Spinal cord** - trauma, SOL, abscess, AVM/haemorrhage
↳ sensory level

Bilateral LMN (distal weakness)

Abnormal sensation distally i.e. sensorimotor polyneuropathy

VIT DIM

- **Vasculitis** - SLE, RA, PAN
- **Infection** - herpes zoster, HIV, leprosy, syphilis
- **Toxins** - alcohol, TB drugs, metronidazole/nitrofurantoin, vincristine/cisplatin, amiodarone
- **Diabetes mellitus**
- **Inherited** - Charcot-Marie-Tooth disease
- **Metabolic** - B12 deficiency, B1 deficiency

Normal sensation i.e. distal motor neuropathy

- Guillain Barre syndrome
- CIDP
- Lead poisoning
- Porphyria
- Myotonic dystrophy
- Inclusion body myositis (proximal in legs but distal in arms)
- Progressive muscular atrophy

Unilateral LMN (weakness depends on lesion)

Work down (nerve root to peripheral nerve)

- Radiculopathy - disc herniation, cervical spondylosis with osteophytes, spinal stenosis, nerve sheath tumours, infection (polio, herpes zoster, CMV, borrelia), cervical rib → **dermatomal sensory loss**
- Plexopathy - brachial neuritis, trauma, congenital (Erb's palsy, Klumpke's palsy), thoracic outlet syndrome, neoplastic infiltration → **vast dermatomal sensory loss**
- Nerve palsy → **peripheral nerve sensory loss**
 - Median (carpal tunnel syndrome) - idiopathic, pregnancy, obesity, local pressure, endocrinological (hypothyroidism, acromegaly, diabetes)
 - Ulnar - compression at elbow (bony, crutches, perioperative/ITU), fracutres, idiopathic, diabetes
 - Radial - at elbow (fracture, dislocation, ganglion), humeral shaft (fracture), or axilla (crutches, sleeping over chair i.e. Saturday night palsy)
 - Axillary - shoulder dislocation
 - Common peroneal - plaster cast compression, trauma, diabetes, leprosy

Mononeuritis multiplex

- Vasculitis - Granulomatosis with polyangiitis (Wegeners), eosinophilic granulomatosis with polyangiitis (Churg-Strauss), polyarteritis nodosa, microscopic polyangiitis
- Autoimmune - RA, SLE, cryoglobulinaemia, Sjogrens, sarcoidosis

UMN + LMN

- MND
- Dual pathology (e.g. cervical myelopathy + polyneuropathy)
- Cervical radiculomyelopathy

Absent ankle (\pm knee) jerks and extensor plantars

- Subacute combined degeneration of the cord
- Syphilitic tabo-paresis
- Friedreich's ataxia
- MND

Cerebellar disease

MAVIS

- MS
- Alcohol
- Vascular - thromboembolic, haemorrhagic
- Inherited - Friedreich's ataxia, spinocerebellar ataxia, ataxia telangiectasia
- SOL

Complex ophthalmoplegia

Work posteriorly (soft tissue to brainstem)

- Soft tissue - Grave's disease
- Muscle - mitochondrial myopathy
- NMJ - myasthenia gravis
 - ↳ TIP: test fatigability
- Multiple CN's - cavernous sinus, mononeuritis multiplex
- Brainstem - stroke, SOL, trauma

Cranial nerve lesions

- Optic atrophy - MS, ischaemic, temporal arteritis, compression (SOL, raised ICP), glaucoma, DM, methanol
- Third nerve palsy - [diabetes, mononeuritis multiplex, MS, SOL], posterior communicating artery aneurysm ('painful'/'surgical'), cavernous sinus thrombosis
- Sixth nerve palsy - [diabetes, mononeuritis multiplex, MS, SOL], raised intracranial pressure
- Unilateral facial nerve LMN - Bell's palsy, Ramsay Hunt syndrome, brainstem (SOL, nuclei demyelination, stroke), Lyme disease, TB, nerve infiltration (sarcoid, lymphoma), parotid tumour/surgery
- Bilateral facial nerve LMN - bilateral Bell's palsy, sarcoid, autoimmune (MG, vasculitis), inflammatory (GBS), dystrophies, amyloidosis
- Bulbar palsy - MND, brainstem infarct/SOL, myasthenia gravis, Guillain Barre, polio, syringobulbubia, syphilis
- Pseudobulbar palsy - MND, brainstem infarct/SOL, MS, internal capsule infarct/small vessel disease, neurodegenerative disorders, brain trauma, high brainstem tumours, PSP

Multiple cranial nerve lesions

- CN 3-6 = cavernous sinus thrombosis
- CN 5-8 + cerebellar = cerebellopontine angle lesion
- CN 9-10
 - + 12 = pseudobulbar/bulbar palsy
 - + 11 = jugular foramen syndrome
 - + Horner's syndrome + cerebellar + sensory disturbance (ipsilateral face, contralateral body) = lateral medullary (Wallenberg) syndrome

Visual field defects

- Homonymous hemianopia - stroke, cerebral SOL
- Bitemporal hemianopia - pituitary tumour, craniopharyngioma, suprasellar meningioma, aneurysm
- Tunnel vision - glaucoma, retinitis pigmentosa
- Central scotoma - MS, ischaemic, temporal arteritis, compression (SOL, raised ICP), glaucoma, DM, methanol
- Homonymous quadrantanopia - **PITS** Parietal = Inferior; Temporal = Superior
- Monocular - central retinal artery occlusion, vitreous haemorrhage, trauma, papilloedema

Ptosis

- Unilateral or bilateral
 - Myasthenia gravis
 - Myotonic dystrophy (frontal balding, facial muscle wasting)
- Unilateral
 - Third nerve palsy (pupil down and out, dilated)
 - Horner's syndrome (pupil constricted)
 - Idiopathic
- Bilateral
 - Congenital
 - Tabes dorsalis (Argyll Robertson pupils)

Horner's syndrome

- 1st order (central) - MS, spondylosis, SOL, syringomyelia, stroke/lateral medullary syndrome
- 2nd order (pre-ganglionic) - Pancoast tumour, cervical rib
- 3rd order (post-ganglionic) - carotid artery dissection

Choreoathetosis

- Chorea - Huntington's disease, Sydenham's chorea, drugs (e.g. anti-psychotics, levodopa), stroke, HIV
- Hemiballism - stroke, SOL, trauma, HIV
- Athetosis - asphyxia, neonatal jaundice, thalamic stroke
- Dystonia - primary dystonia, brain trauma, drugs, Wilson's disease, PD, Huntington's disease, stroke, SOL, encephalitis, asphyxia
- Myoclonus - epilepsy, essential myoclonus, metabolic, psychological, toxins/drugs, SOL, MS, PD, CJD