

## UPPER VS LOWER MOTOR NEURON DISEASE

## A . UPPER MOTOR NEURON

## 1 . Multiple sclerosis

Motor & sensory, descending  
Asymmetric  
(Optic nerve involved)  
Spinal cord lesions in most patients

## 2 . Progressive multifocal leukoencephalopathy (JC virus reactivation)

Motor (hemiparesis) & sensory  
Asymmetric  
(Optic nerve NOT involved; may have hemianopsia [occipital lobe])  
Spinal cord lesions rare  
Fast deterioration

## B . UPPER &amp; LOWER MOTOR NEURON

## 1 . ALS

Motor only  
Starts as unilateral weakness in distal legs/arms; eventually symmetric  
Facial muscles, speech affected  
Diaphragm affected  
Extraocular muscles spared; bowel/bladder function spared

## 2 . Conus Medullaris Syndrome

Motor and sensory  
Symmetric (vs Cauda equina [asymmetric])  
Severe lower back pain, lower limb motor weakness, paresthesia/  
numbness, saddle anesthesia  
Anal sphincter dysfunction; urinary retention/overflow incontinence  
Impotence  
Sudden onset (vs Cauda equina [gradual])  
Patella reflex preserved (vs Cauda equina); Achilles reflex diminished

## C . LOWER MOTOR NEURON

## 1 . Guillaine-Barre Syndrome (GBS)

Motor & sensory, ascending

Symmetric

Diaphragm affected

Autonomic dysfunction: constipation, urinary retention, BP/arrhythmia

Bilateral facial nerve palsy (also CN 3-12)

## 2 . Myasthenia Gravis (MG)

Motor only

Symmetric

Facial muscles affected

Diaphragm affected

No UMN/LMN signs (reflexes preserved)

## 3 . Lambert-Eaton Myesthenic Syndrome (LEMS)

Motor only

Symmetric

Facial muscles affected

Autonomic effects (from low acetylcholine)

Diaphragm may be affected late in disease

Reduced or absent reflexes

## 4 . Polio

Motor only

Asymmetric

Rarely autonomic

## 5 . Spinal muscular atrophy

Motor only (floppy baby)

Symmetric

## 6 . Botulism

Motor only (floppy baby), descending

Symmetric flaccid paralysis always beginning w cranial nerves.

Dysphagia

Autonomic effects (low Ach)

## 7 . Siringomyelia

Motor & sensory

Motor may be asymmetric; loss of pain/temp. in cape-like distribution

## 8 . Cauda Equina Syndrome

Motor and sensory

Asymmetric

Low back pain, lower limb motor weakness, paresthesia/numbness, saddle anesthesia

Anal sphincter dysfunction; urinary retention/overflow incontinence

Impotence

Gradual onset

Patella reflex diminished; Achilles reflex diminished

## NOTES/RECAP

GBS, botulism both infectious, both symmetrical, both autonomic dysfunction

GBS ascending vs. botulism descending

GBS motor/sensory, botulism motor

Polio vs GBS/botulism

All are infectious

Polio asymmetric, rarely autonomic (some skin/cold intolerance from sympathetic effects)

Polio vs botulism

Both infectious, both motor only

Botulism symmetric, autonomic effects

MG/LEMS vs ALS

All: No sensory

All: diaphragm affected

All: can present as symmetric weakness

extra-ocular muscles affected vs ALS, spared

ALS is upper motor neuron and lower motor neuron

SMA vs botulism

Both motor only/floppy, symmetric

botulism has anticholinergic effects

Myasthenia gravis vs Lambert Eaton

Both: motor only, symmetric, diaphragm/facial muscles, autoimmune

LEMS: has anticholinergic effects

LEMS VS GBS

both: symmetric, facial muscles; autonomic effects; autoimmune

LEMS: motor only

#### Cauda equina syndrome vs ALS

both: asymmetric; lower motor neuron muscle weakness

ALS: also upper motor neuron; sensory intact; bowel/bladder intact;

Respiratory problems

#### Cauda equina vs conus medullaris

Both: Motor and sensory

lower limb motor weakness, paresthesia/numbness

saddle anesthesia, bowel/bladder incontinence, impotence

Cauda equina: asymmetric, only lower motor neuron, more gradual onset

with less severe back pain, both patella/achilles reflexes lost