

Motor Examination

General Inspection

- Asymmetry
- Abnormal Posture
- Orientation to person, place and time
- Ask patient if they have any pain
- Gross Abnormal movements

Closer Inspection

- Tremor
- Scars
- Fasciculations (LMNL)
- Muscle wasting (LMNL)

Upper Limb

- **Tone:** 0 to ++++ (Increased suggests UMNL, flaccidity suggests LMNL), check clonus (UMNL)
- **Power:** 1-5
- **Reflexes:** Biceps, Triceps, Brachioradialis, Finger (0 to ++++, normal is ++)
- **Coordination:** Finger to nose then examiner's hand (past pointing, intention tremor), and tapping hand on palm before turning rapidly (dysdiadochokinesis)

Lower Limb

- **Tone:** Increased suggests UMNL, Flaccidity suggests LMNL, check clonus (UMNL)
- **Power:** 1-5
- **Reflexes:** Knee, Ankle, Plantar
- **Babinski's Sign:** plantar reflex upgoing rather than downgoing, suggestive of UMNL, upgoing may be normal in babies
- **Coordination:** dysdiadochokinesis, past pointing, intention tremor

Gait

- Walk normally
- Walk on toes (Difficult with S1/S2 lesion)
- Walk on heels (Difficult with L4/L5 lesion)
- Heel to toe (Midline cerebellar lesion)
- Squat and stand without holding anything
- Romberg Test (Vestibular system and proprioception)

Upper Motor Neuron Lesions Versus Lower Motor Neuron Lesions

Feature	Upper	Lower
Tone	Increased tone and Spasticity present and often associated Clonus	Reduced Tone (flaccid paralysis)
Power	Weakness in all muscle groups. In upper limb abductors and extensors are often worst, in lower limb the flexors and abductors	Weakness more obvious distally than proximally, with flexor and extensor muscles equally involved.
Reflexes	Reflexes are increased except for superficial reflexes (e.g. abdomen), which are absent	Reflexes are reduced , and plantar response is normal or absent
Wasting	Very little muscle wasting	Prominent muscle wasting
Other	Babinski reflex present	Fasciculations can be present

Upper Limb		Lower Limb	
Movement	Nerve Roots	Movement	Nerve Roots
Shoulder Abduction	C5	Hip Flexion	L2, L3
Shoulder Adduction	C6, C7, C8	Hip Extension	L4, L5
Lateral Rotation	C5	Hip Adduction	L2, L3, L4
Medial Rotation	C6, C7, C8	Hip Abduction	L4, L5, S1
Shoulder Flexion	C5	Knee Flexion	L5, S1
Shoulder Extension	C6, C7, C8	Knee Extension	L3, L4
Elbow Flexion	C5, C6	Dorsiflexion	L4, L5
Elbow Extension	C7, C8	Plantarflexion	S1, S2
Wrist Flexion and Extension	C6, C7	Ankle Inversion	L4
Forearm Supination	C6	Ankle Eversion	L5, S1
Forearm Pronation	C7	Hallux Flexion	S1
MCPJ Flexion and Extension	C7, C8	Hallux Extension	L5
MCPJ Abduction and Adduction	T1		
Reflex	Spinal Level	Reflex	Spinal Level
Biceps	C5, C6	Knee	L3, L4
Supinator (Brachioradialis)	C5, C6	Ankle	S1, S2
Triceps	C7, C8	Plantar	L5, S1, S2
Finger Jerk	C8, T1		

Power Grading		Reflex Grading	
Grade	Definition	Grade	Definition
0	Complete Paralysis	0	Absent
1	Flicker of contraction	+	Present but reduced
2	Movement without gravity	++	Normal
3	Movement against gravity	+++	Increased, Possibly Normal
4	Movement against some resistance	++++	Greatly Increased, often associated with clonus
5	Normal Power		

References:

Talley, N.J & O'Connor, S 2014. Clinical Examination: A Systematic Guide to Physical Diagnosis. 7th ed. Elsevier. Section 9, Chapter 34.