

APPENDIX: NEUROLOGICAL ASSESSMENT

Depending on the chief complaint, a neurologic assessment may be required as part of a complete musculoskeletal exam.

INSPECTION

- *Inspection can generally be done throughout the examination beginning as the patient enters the room*
- Posture and gait
 - *Abnormal position may indicate neurologic deficits*
- Involuntary movements
 - *Tremors, tics, or fasciculations*
- Muscle bulk
 - *Assess for any signs of muscle atrophy*

TONE

- *With the patient relaxed, support the limb and put the muscle group through their full range of movement*
- **Decreased Tone (Hypotonia)**
 - *Seen in lower motor neuron lesions (nerve root, peripheral nerve)*
- **Increased Tone**
 - **Spasticity**
 - *Increased resistance that varies and is often worse at the extreme of the range of motion*
 - **Cog-Wheel Rigidity**
 - *Intermittent increased resistance and tremor, felt as jerky, “cog-wheeling” resistance on passive motion*
 - *May indicate Parkinson’s Disease*
 - **Lead-Pipe Rigidity**
 - *Increased resistance that persists throughout the entire range of motion*
 - *May indicate Parkinson’s Disease*

POWER

Best to do resisted isometric testing: position the joint as required and then apply force while having the patient resist

Score	Description
5	Movement against gravity with full resistance
4	Movement of the body part against gravity and some resistance
3	Movement of the body part against gravity only
2	Movement of the body part with gravity eliminated (supported)
1	Muscle contraction, but no joint movement
0	No muscle contraction

REFLEXES

- Response depends partly on the force of stimulus
- Hyperactive reflexes and sustained suggest upper motor neuron lesions
- Diminished or absent reflexes suggest damage to the spine (specifically the level at which the tested nerve originates), peripheral nerves, muscle pathology, or neuromuscular junction disorders
 - *If reflexes are diminished or absent bilaterally, reinforcement may increase reflexes*
 - *Ask the patient to clench his teeth or to lock his/her fingers and pull*

Grade	Description
0	Absent
1+	Diminished
2+	Normal
3+	Hyperactive without clonus
4+	Hyperactive with clonus

SENSATION

For the purposes of a musculoskeletal exam, a quick check of light touch sensation in relevant dermatomes suffices

- *If a spinal cord lesion is suspected:*
 - *Meticulous detailing of the location of altered sensation*
 - *Testing of light touch, pain and temperature (spinothalamic tract), and position and vibration (posterior column)*
- Patient closes their eyes, and indicates when they feel touch from the examiner
 - Sensation should be compared to the other side of the body
 - Ensure that the pace is varied so that patients do not merely respond to a pattern
 - A cotton ball or tongue depressor are commonly used

NEUROLOGIC ASSESSMENT OF THE UPPER BODY

*May be used to assess and isolate a potential cause of pathology in the **cervical spine or upper limbs***

Nerve	Spinal	Muscle	Movement	Sensation	Reflex
Axillary	C5,6	Deltoid	Arm abduction	Deltoid	
Radial	C6,7,8	Triceps	Elbow extension	Anatomic snuff box	Triceps Brachioradialis
	C7,8	Wrist extensors	Wrist extension "Thumbs up" sign	Dorsal side of radial 1/2 of hand	
Musculocutaneous	C5,6	Biceps	Elbow flexion	Lateral forearm	Biceps
Median	C6,7	Flexor pollicis longus	Thumb IP flexion "Okay sign"	Palmar side of first 3 1/2 fingers	
Ulnar	C8,T1	Interossei	Finger abduction /	5th finger	

		of hands	adduction		
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NEUROLOGIC ASSESSMENT OF THE LOWER BODY

*May be used to assess and isolate a potential cause of pathology in the **hip, leg, ankle, or foot***

Nerve	Spinal	Muscle	Movement	Sensation	Reflex
Femoral	L1,2,3	Iliopsoas	Hip flexion		
	L2,3,4	Quadriceps	Knee extension	Anterior thigh	Patellar
Obturator	L2,3,4	Hip adductors	Hip adduction	Innermost thigh	
Superior gluteal	L4,5,S1	Hip abductors	Hip abduction		
Sciatic	L5,S1,2	Hamstrings	Knee flexion	Outer thigh, calf	Achilles
Deep peroneal	L4,5	Tibialis anterior	Ankle dorsiflexion		
	L5,S1	Extensor hallucis longus	Great toe dorsiflexion	Space between the great toe and second toe	
Tibial	S1,2	Gastrocnemius, soleus	Ankle plantar flexion	Plantar aspect of the arch of the foot	Achilles
Posterior tibial	L4,L5	Tibialis	Posterior foot inversion		
Superficial peroneal	L5,S1	Peroneus longus, brevis	Foot eversion	Dorsum of foot	