Tetraplegia or Quadriplegia

- Tetraplegia or quadriplegia as it is more commonly known, means paralysis involving all four extremities.
Hoffmann’s Pathological Reflex

Fig. 3-8. Hoffmann’s sign, indicating an upper motor neuron lesion.

Jefferson’s “Bursting” Fracture

Fig. 3-9. Jefferson fracture, a bursting fracture of the ring of C1.
Hangman’s Fracture of C2

Fig. 3-11. Hangman’s fracture. Fracture the base of C2 due to violent motion.

Odontoid Fracture of C2

Fig. 3-13. Odontoid fracture.

Fig. 3-14. Odontoid fracture.

Cervical Compression Fracture
Hyperflexion Injury of the Cervical Spine

Fig. 3-12. Cervical compression fracture, caused by hyperflexion of the neck.

Fig. 3-16. Cervical spine compression fracture.
Activities of Daily Living

Respiration
- C3 or higher is incompatible with life and would require permanent ventilation
- C4-5 produces respiratory insufficiency and increases risk with an upper respiratory infection

Activities of Daily Living

Wheelchair
- C6 and below permits manipulation of a wheelchair
- C6 presents transfer problems due to lack of innervation of the triceps

Activities of Daily Living

Crutches
- Complete cord lesions at C8 and above prevent use of crutches due to loss of grip strength

Spinal Cord Lesions Below T1
Including the Cauda Equina
- Paraplegia is the complete or partial paralysis of the lower extremities and lower portion of the body.
Sensory Evaluation

- Sensory evaluation is easier than the motor evaluation

Motor Evaluation

- Motor testing of the intercostal muscles involves observation of the respiratory activity

Motor Evaluation

- Abdominal and paravertebral muscles innervated by T7 – T12 (L1)
- Half sit-up tests are not performed during acute stage
- Beevor’s Sign

L1 Neurologic Level
L1 Intact

- Some hip flexion but complete paralysis of lower extremities
- No sensation inferior to L1 sensory band
- Initially LE DTR’s are absent
- When spinal shock wears off, the reflexes become exaggerated
- Loss of bowel and bladder function

L2 Neurologic Level
L2 Intact

- Partial function of iliopsoas and adductors
- No sensation below L2 sensory band
- Minimal patellar reflex possible
- No voluntary control of bowel and bladder
L3 Neurologic Level

L3 Intact

- Partial function of quadriceps and adductors
- Full strength of iliopsoas
- Sensation is normal to level of knee
- Decreased patellar and absent Achilles
- No bowel and bladder control

L4 Neurologic Level

L4 Intact

- Iliopsoas, adductors, and quadriceps motor WNL
- Tibialis inverts and dorsiflexes foot
- Sensory loss to L5 and S1,2,3,4
- No voluntary control of bowel and bladder function

L5 Neurologic Level

L5 Intact

- Gluteus maximus does not function with hip flexion deformity
- Partial function of gluteus medius
- Knee flexors function partially with medial hamstring but not the lateral hamstrings
- Dorsiflexion deformity of foot due to plantar flexors and evertors absent

L5 Neurologic Level

L5 Intact

- Lower extremities have normal sensation except at lateral side and plantar surface of foot
- Medial hamstring and patellar DTR WNL but achilles is zero +
- No control of bowel and bladder function

S1 Neurologic Level

S1 Intact

- Slight gluteus maximus weakness
- Weakness in soleus and gastrocnemius
- Clawing of toes due to weakness of intrinsic muscles

S1 Neurologic Level

S1 Intact

- Sensation in lower extremities WNL
- Perianal anesthesia
- DTR for LE are 2+
- No bowel or bladder function
Pathologic Reflex
Babinski Sign is Present

Pathologic Reflex
Oppenheim’s Sign is Present

Normal Superficial Reflex
Cremasteric Reflex

Fig. 4-2. Babinski’s sign.

Fig. 4-5. Babinski’s sign.

Fig. 4-4. Differences in flexion joint anatomic of the thoracic and lumbar spines.

Fig. 4-7. The bulbocavernous reflex.
Fig. 4-8. A herniated thoracic disc.

Fig. 4-9. The posterior ligamentous complex.

Supraspinous Lig.
Interspinous Lig.
Ligamentum Flavum
Joint Capsule

Fig. 4-10. A palpable spinal defect indicating an unstable spinal injury.

Flexion Injury
Stable

Fig. 4-11. A flexion injury.

Flexion Injury
Unstable

Fig. 4-12. An unstable flexion injury.

Fig. 4-13. A flexion-rotation injury resulting in a fracture-dislocation of the spine.