**Anatomy**

**Components of The Spinal Column**

- Extends from the skull to the pelvis
- 33 vertebrae
  - 7 Cervical vertebrae (C1-C7)
  - 12 Thoracic vertebrae (T1-T12)
  - 5 Lumbar vertebrae (L1-L5)
  - 5 fused Sacrum vertebrae (S1-S5)
  - 4 Coccyx vertebrae

**Spinal Curves**

- Kyphosis or Kyphotic Curve
  - Concave anteriorly and convex posteriorly
- Lordosis or Lordotic Curve
  - Convex anteriorly and concave posteriorly

**Normal Curvature**

- Cervical Lordosis 20 to 40 degrees
- Thoracic Kyphosis 20 to 40 degrees
- Lumbar Lordosis 40 to 60 degrees
- Sacral Kyphosis Sacrum fused in a kyphotic curve
Anatomy

Functions of The Spinal Column

- Protects
  - Spinal Cord
  - Nerve Roots
  - Internal organs

- Mobility: allows for
  - Flexion (forward bending)
  - Extension (backward bending)
  - Side bending (left and right)
  - Rotation (left and right)

- Structure
  - Anchors head, shoulders, chest
  - Connects upper and lower body
  - Balances body
  - Distributes weight
Figure 4-2  A: Lateral view of the vertebral column. B: General features of different kinds of vertebrae.
The Motor Strip
Fibers
Figure 4-11  Transverse section of the spinal cord at the midcervical level showing the general arrangement of the ascending tracts on the right and the descending tracts on the left.
Figure 4-31  Spinal cord syndromes.
Figure 4-33  Skin area in which the sensations of pain and temperature are lost in syringomyelia.
Lesion on this side

Total loss of all sensations—hypotonic paralysis

Loss of tactile discrimination, vibratory and proprioceptive sensations—spastic paralysis

Loss of pain and temperature sensations, impaired tactile sense

Figure 4.32 Brown-Séquard syndrome with a spinal cord lesion at the right 10th thoracic level.
Figure 14-7  This man is making good use of the sympathetic part of his autonomic nervous system.
Figure 14-8  There is nothing like a good, large meal and a comfortable armchair to facilitate the activities of the parasympathetic part of the autonomic nervous system.
<table>
<thead>
<tr>
<th>Root Injury</th>
<th>Dermatome Pain</th>
<th>Muscles Supplied</th>
<th>Movement Weakness</th>
<th>Reflex Involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>C5</td>
<td>Lateral side of upper part of arm</td>
<td>Deltoid and biceps brachii</td>
<td>Shoulder abduction, elbow flexion</td>
<td>Biceps</td>
</tr>
<tr>
<td>C6</td>
<td>Lateral side of forearm</td>
<td>Extensor carpi radialis longus and brevis</td>
<td>Wrist extensors</td>
<td>Brachioradialis</td>
</tr>
<tr>
<td>C7</td>
<td>Middle finger</td>
<td>Triceps and flexor carpi radialis</td>
<td>Extension of elbow and flexion of wrist</td>
<td>Triceps</td>
</tr>
<tr>
<td>C8</td>
<td>Medial side of forearm</td>
<td>Flexor digitorum superficialis and profundus</td>
<td>Finger flexion</td>
<td>None</td>
</tr>
<tr>
<td>L1</td>
<td>Groin</td>
<td>Iliopsoas</td>
<td>Hip flexion</td>
<td>Cremaster</td>
</tr>
<tr>
<td>L2</td>
<td>Anterior part of thigh</td>
<td>Iliopsoas, sartorius, hip adductors</td>
<td>Hip flexion, hip adduction</td>
<td>Cremaster</td>
</tr>
<tr>
<td>L3</td>
<td>Medial side of knee</td>
<td>Iliopsoas, sartorius, quadriceps, hip adductors</td>
<td>Hip flexion, knee extension, hip adduction</td>
<td>Patellar</td>
</tr>
<tr>
<td>L4</td>
<td>Medial side of calf</td>
<td>Tibialis anterior, quadriceps</td>
<td>Foot inversion, knee extension</td>
<td>Patellar</td>
</tr>
<tr>
<td>L5</td>
<td>Lateral side of lower leg and dorsum of foot</td>
<td>Extensor hallucis longus, extensor digitorum longus</td>
<td>Toe extension, ankle dorsiflexion</td>
<td>None</td>
</tr>
<tr>
<td>S1</td>
<td>Lateral edge of foot</td>
<td>Gastrocnemius, soleus</td>
<td>Ankle plantar flexion</td>
<td>Ankle jerk</td>
</tr>
<tr>
<td>S2</td>
<td>Posterior part of thigh</td>
<td>Flexor digitorum longus, flexor hallucis longus</td>
<td>Ankle plantar flexion, toe flexion</td>
<td>None</td>
</tr>
</tbody>
</table>
Causes of myelopathy:
1- congenital (chiari-malformatin, syringomyelia)
2- acquired (stenosis, traumatic, disc,)
3- neoplastic
4- vascular (hematoma, AVM)
5- infectious (TB, others)