Neurological Assessment for patient with Spinal Injury

KO Kwok
Spine team
Department of O&T
Prince of Wales Hospital
22nd April, 2007

Objective of neurological assessment

- Normal / with deficit
- Complete or incomplete - prognosis
- Upper motor neuron lesion/ lower motor neuron lesion
- Detail documentation for progress monitoring

Function appears normal

- Palpate each segment
- Inspect the skin for focal kyphosis
- Evaluate focal pain, spasm
- Note any apprehension
  - Indicate instability
Deficit is found

- Complete / incomplete
  1. Check spinal shock by bulbocavernosus reflex
  2. Check sacral sparing

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>No motor or sensory function</td>
</tr>
<tr>
<td>B</td>
<td>Preserved sensation only, no motor function</td>
</tr>
<tr>
<td>C</td>
<td>Non-ambulatory, wheelchair-bound, some motor function</td>
</tr>
<tr>
<td></td>
<td>a bowel or bladder paralysis</td>
</tr>
<tr>
<td></td>
<td>b neurogenic bowel or bladder</td>
</tr>
<tr>
<td></td>
<td>c voluntary normal bowel or bladder function</td>
</tr>
<tr>
<td>D</td>
<td>Ambulatory but with neurological symptoms</td>
</tr>
<tr>
<td></td>
<td>1 Requires walker</td>
</tr>
<tr>
<td></td>
<td>2 Requires cane</td>
</tr>
<tr>
<td></td>
<td>3 Can walk independently</td>
</tr>
<tr>
<td></td>
<td>a bowel or bladder paralysis</td>
</tr>
<tr>
<td></td>
<td>b neurogenic bowel or bladder</td>
</tr>
<tr>
<td></td>
<td>c voluntary, normal bowel or bladder function</td>
</tr>
<tr>
<td>E</td>
<td>Normal neurological function</td>
</tr>
</tbody>
</table>

Detail documentation

- Tone
- Motor
- Coordination
- Reflex
- Sensation

Tone

- Flaccid
  - Lower motor neuron lesion
  - Acute lesion
- Rigid
  - Upper motor neuron lesion
  - Chronic
Motor

0 = total paralysis
1 = palpable or visible contraction
2 = active movement, gravity eliminated
3 = active movement, against gravity
4 = active movement, against some resistance
5 = active movement, against full resistance

Figure 3: Neurologic level C5.

Figure 4: Neurologic level C6.

Figure 5: A herniated disc between vertebrae C6 and C7 involves the C7 root.
Figure 7: A herniated disc between vertebrae C7 and T1 involves the C8 root.

Figure 8: A herniated disc between vertebrae L1 and L4 involves the L4 nerve root.

Figure 9: A herniated disc between vertebrae L1 and L4 involves the L4 nerve root.

Figure 10: A herniated disc between vertebrae L4 and L5 involves the L5 nerve root. This is the second most common level of disc herniation in the lumbar spine.

Figure 11: A herniated disc between vertebrae L5 and S1 involves the S1 nerve root. This is the most common level of disc herniation in the lumbar spine.
Conclusion

- Continuous monitoring
- Special pattern
  - Central cord syndrome
- ASIA score for tetra/paraplegic patient