

# The Neurological Exam, Beyond Concussions

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## Learning Objectives

- Central Spinal Cord Syndrome
- Cauda Equina Syndrome
- Transient Brachial Plexopathy “Stinger”
- Brown-Sequard Syndrome
- Anterior Spinal Cord Syndrome
- Neurological Exam

## Central Cord Syndrome

Mechanism

Testing & Diagnosis

Symptoms

Prognosis:

Examination

## Cauda Equina Syndrome

‘Red flag’ symptoms:

Examination

Mechanism

Testing & Diagnosis

Symptoms

Prognosis

Three variations:

Varies:

## Summary of management

- Rare condition but may have devastating consequences for patients if the condition is not adequately managed in order to avoid unpleasant clinical and legal sequelae.
- Early diagnosis by ATC gives the patient the best chance of a satisfactory outcome .

- Emergency action plans must respond quickly, to confirm the clinical diagnosis then alerting the emergency medical response team. Baseline neurological criteria should be noted.
- An emergency MR scan should be arranged as soon as possible. In the hospital, Ultrasound may be useful in assessing urinary retention.
- A proper explanation concerning short and long term prognosis should take place in order to avoid misunderstanding and the possibility of litigation if a neurological deficit persists.
- Decompressive surgery as soon as adequately skilled personnel and infrastructure are available, preferably within 24 h after injury.
- Sympathetic and supportive multidisciplinary postoperative management over many months may be necessary for complete recovery

### **Brown-Sequard Syndrome**

Mechanism of injury

Testing

Symptoms

Prognosis

Examination

### **Transient Brachial Plexopathy - “Stinger”**

Mechanism of injury

Testing

Symptoms

Prognosis

Examination

### **Anterior spinal cord syndrome**

Mechanism

Testing & Diagnosis

Symptoms

Examination

Prognosis

## The Neurological Exam

- Glasgow Coma Scale - GCS 15 : (M6, E5, V4)
  - Motor: 6 = Obeys verbal commands, 5 = Localizes to pain, 4 = Withdraw to pain, 3 = Flex to pain, 2 = Extend to pain, 1 = No response
  - Eye: 4 = Open spontaneously, 3 = Open to verbal command, 2 = Open to pain, 1 = No response
  - Voice: 5 = Oriented, converses, 4 = Disoriented, converses, 3 = Inappropriate responses, 2 = incomprehensible sounds, 1 = No response, T = intubated

➤ Alert and Oriented x3 (4): Person, Place, Time (Situation)

➤ Speech/language intact, fluent

➤ PERRL, EOMI, Visual fields intact

➤ Facial Symmetric, Tongue Midline

➤ Facial sensation symmetric/intact

➤ Negative drift

➤ Motor: Symmetrical

Bilateral shoulder shrug intact, 5/5

	Deltoid	Biceps	Triceps	Hand grip	Hand Intrinsic
RUE	5/5	5/5	5/5	5/5	5/5
LUE	5/5	5/5	5/5	5/5	5/5
	Hip Flexion	Knee Extension	Dorsiflexion	Ex Hallicus	Plantar flexion
RLE	5/5	5/5	5/5	5/5	5/5
LLE	5/5	5/5	5/5	5/5	5/5

➤ Sensation grossly intact to sharp/dull sensation

➤ (-) Hoffman's

➤ (-) Clonus

➤ 2+ reflexes throughout in upper and lower extremities

Biceps 2+ Triceps 2+ Brachioradialis 2+

Patellar 2+ Achillies 2+

➤ Toes upgoing (Babinski)

➤ Proprioception intact

- Normal coordination, No dysmetria
- Normal gait/Antalgic gait

### **ASIA Impairment Scale – American Spinal Injury Association**

- The extent of spinal cord injury is defined by the American Spinal Injury Association (ASIA) Impairment Scale (modified from the Frankel classification), using the following categories:

**A** = Complete: No sensory or motor function is preserved

**B** = Incomplete: Sensory, but not motor, function is preserved below the neurologic level

**C** = Incomplete: Motor function is preserved below the neurologic level, and most key muscles below the neurologic level have a muscle grade of less than 3

**D** = Incomplete: Motor function is preserved below the neurologic level, and most key muscles below the neurologic level have a muscle grade that is greater than or equal to 3

**E** = Normal: Sensory and motor functions are normal

Example: Weightlifter performing a deadlift feels a pop in his back, he falls to the ground and loses strength in Toe extension, foot plantarflexion and foot eversion, he has no symptoms in the same region, achillies reflex is absent bilaterally

#### Classified ASIA:

Example: Gymnast performing a landing from uneven bars, extends her back on impact. Immediately falls to the ground. She is able to extend her knee/dorsiflex her foot to gravity. And has normal sensation throughout

#### Classified ASIA: