



---

## Learning Objectives for Rotations in Neurosurgery Year 3 Basic Clerkship

---

### SEMINAR I: HEAD INJURIES AND INTRACRANIAL PRESSURE

#### Scenario I:

*A 23-year old man is brought to the Emergency Room unconscious. You are told he was driving a car that left the road at high speed and struck some trees.*

After the clerkship, the student should be able to:

1. Conduct an initial trauma assessment and know what procedures should be undertaken on an urgent basis.
2. Describe the level of consciousness using the Glasgow Coma Scale.
3. Conduct a physical exam and order x-rays to rule out the possibility of a spinal injury.
4. Know when endotracheal intubation is indicated.
5. Order appropriate laboratory tests.
6. Understand the indications for a CT scan.

Knowledge Base - be able to describe:

1. The mechanism of transtentorial herniation and its clinical manifestations as it progresses.
2. The appearance on a CT scan of hemorrhage into the intracerebral, subdural and epidural compartments.
3. What should be done to prevent, detect and/or treat: aspiration of stomach contents; cerebral hypoxia due to brain swelling; acute subdural or epidural hematoma.
4. Typical clinical features of acute subdural hematoma and acute subdural hematoma.
5. Pathogenesis of chronic subdural hematoma.

#### Scenario II:

*An 18 year old riding in the back of a pick-up truck is found, after the truck rolls over on a sharp curve, lying on the ground, in pain and unable to move his legs. He is brought to the Emergency Room of a hospital in a rural community.*

After completing the clerkship the student should be able to:

1. Conduct an initial assessment.
2. Order appropriate treatment until transfer to a spinal cord injury centre can be undertaken.

Knowledge Base - to be able to describe:

1. How to transfer a patient with an unstable fracture off a stretcher onto a bed or x-ray table.
2. How to prevent an injury to the spinal cord from occurring after the patient reaches the hospital.
3. Neurological findings related to injuries that may be caused by fractures or dislocations of the cervical, thoracic or lumbar spinal column.
4. What should be done to prevent complications occurring related to the lungs, GI tract, urinary bladder and skin.

## SEMINAR II: SUBARACHNOID HEMORRHAGE AND INTRACRANIAL NEOPLASMS

### Scenario I:

*A 45-year old woman comes to the Emergency Room having experienced the sudden onset of the worst headache she has ever had.*

The student should be able to:

1. List the cardinal features on history and physical examination to make a diagnosis of subarachnoid hemorrhage.
2. Devise an investigation plan to prove or rule out the diagnosis.

Knowledge Base - to be able to describe:

1. The causes of subarachnoid hemorrhage and intracerebral hemorrhage.
2. The natural history of a ruptured aneurysm of the Circle of Willis if left untreated.
3. The manifestation of recurrent hemorrhage, vasospasm and hydrocephalus after subarachnoid hemorrhage.

### Scenario II:

*A 60-year old man complains of headaches and difficulty using his left arm and leg which has been getting worse over the past two weeks.*

The student should be able to:

1. Take a history to localize the site of brain disorder and possible source of the problem.
2. **Conduct a physical exam to localize region of brain dysfunction and possible primary sources of a tumor.**
3. Recognize clinical evidence of raised intracranial pressure.

Knowledge Base - be able to describe:

1. Common tumor for particular sites in children and adults.
2. Natural history of these tumors if untreated.
3. Pathogenesis of raised intracranial pressure with or without hydrocephalus.
4. Characteristics of the three common modes of onset (raised intracranial pressure, focal neurological deficit, epilepsy) for brain tumors or brain abscess.

### **SEMINAR III: TRAUMATIC, DEGENERATIVE AND NEOPLASTIC DISORDERS OF THE SPINE AND SPINAL CORD**

#### **Scenario I:**

*A 35-year old man having had pain in the right scapular region for several days presents with severe right shoulder and arm pain with tingling in his thumb and index finger.*

The student should be able to:

1. Elaborate a history of radiculopathy causing pain and dysfunction of a cervical or lumbar nerve root.
2. Undertake a physical exam to evoke evidence of nerve root tension and nerve root dysfunction.
3. Describe motor, sensory and reflex changes that may be found in radiculopathy caused by herniation of C5-6, C6-7, L3-4, L4-5 and L5-S1 discs.

#### **Scenario II:**

*A 70-year old woman has a six month history of progressing back pain and has pain and numbness in her legs which comes on when she walks a short distance.*

The student should be able to:

1. Elaborate a history indicative of lumbar spinal stenosis.
2. Undertake a physical exam to detect signs of compression of the cauda equina.
3. Describe clinical findings that would distinguish leg pain on walking caused by lumbar spinal stenosis from that caused by arterial insufficiency in the legs.

#### **Scenario III:**

*A 60-year old man is becoming progressively weaker in his arms and legs and his legs are becoming numb.*

The student should be able to:

1. Elaborate a history and undertake a physical examination to evaluate the diagnosis of cervical spondylotic myelopathy.
2. Describe pathological changes that cause degenerative changes in the spine (spondylosis) to produce compression of the contents of the spinal canal.

#### **Scenario IV:**

*A 50-year old woman with a history of breast cancer has midthoracic back pain for three weeks and is having difficulty walking.*

The student should be able to:

1. Seek details in the history to gain more information.
2. Describe physical findings that may be found with spinal cord compression from a secondary tumour.
3. Describe the pathogenesis of spinal cord compression caused by breast cancer.