



# GirlsGotSTEAM x Simply Neuroscience “Neurosurgery: An Introduction” Workshop!

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Today, we will be getting a quick overview about the different forms of neurosurgery practiced in the field.

Using what you've learned, you'll engage in a fun matching activity and create a quick project about a surgery interesting to you!



# What is Neurosurgery?

- Neurosurgery is the medical specialization concerned with prevention, diagnosis, and surgical treatment of disorders which affect the nervous system.
- The nervous system includes the brain, spinal cord, peripheral nerves, and cerebrovascular system.





# What is a Neurosurgeon?

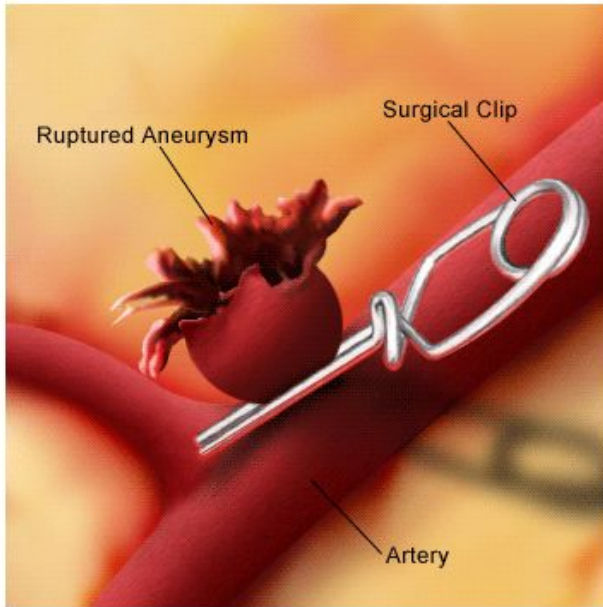


- Neurosurgeons are doctors who diagnose and treat problems with the nervous system.
- They often perform surgery on the brain or spine.
- They treat strokes, tumors, certain types of birth defects, infections and head/spinal cord injuries.



# Vascular Neurosurgery

## Clipping Treatment for Cerebral Aneurysm



- Vascular neurosurgery deals with anything that relates to the blood vessels in the brain and spinal cord
- It specializes in diagnosing and treating neurovascular disorders of the brain and spinal cord, such as aneurysms, stroke, and spinal lesions.



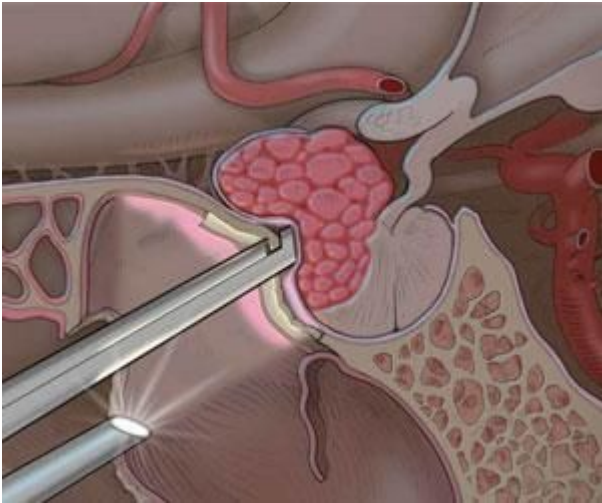
# Stereotactic Neurosurgery

- Stereotactic neurosurgery is a minimally invasive procedure that uses MRI or CT scans to help remove lesions and tumours in the brain.
- Beforehand, neurosurgeon would take a scan of the brain, which they would use to decide how to take the abnormality out
- During the surgery, the patient is awake and they will use specific instruments to take it out.





# Oncological Neurosurgery



- Oncology is the study and treatment of cancers.
- Brain tumors are some of the deadliest to deal with, and neuro-oncologists are the doctors who treat/remove these tumors.
- They think about how to remove these brain tumors while minimizing the damage to surrounding brain tissue using diagnostic radiological imaging, such as computed tomography and magnetic resonance imaging scanning.



# Spinal Neurosurgery

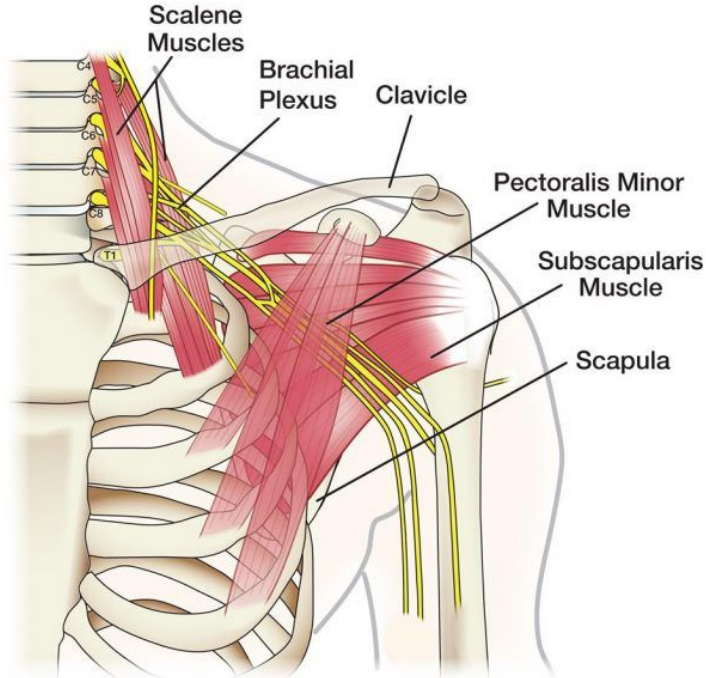
- Spinal neurosurgeons treat a variety of disorders that have to do with the spinal cord and spinal column.
- They treat arthritic conditions like herniated discs and bone spurs (which put pressure on the nerve roots and the spinal cord), tumors of the spine and spinal cord, spinal fractures, and deformities of the spine (scoliosis and spondylolisthesis).
- Spinal neurosurgery is usually done on elderly patients.







# Peripheral Nerve Neurosurgery

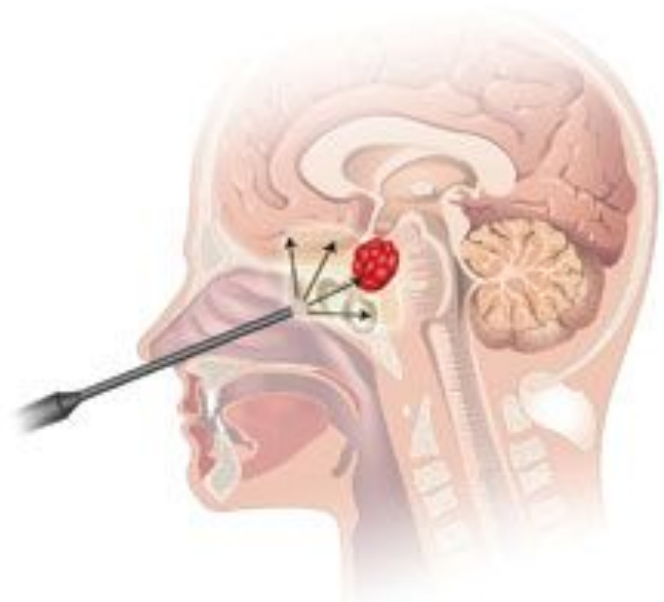


- Peripheral nerves are nerves that are not encased in bones, and it is found throughout our bodies.
- Peripheral nerve neurosurgeon specializes in the diagnosis and treatment of a variety of peripheral nerve disorders that includes injuries, entrapments and tumours.
- It can help treat carpal tunnel syndrome and schwannoma.



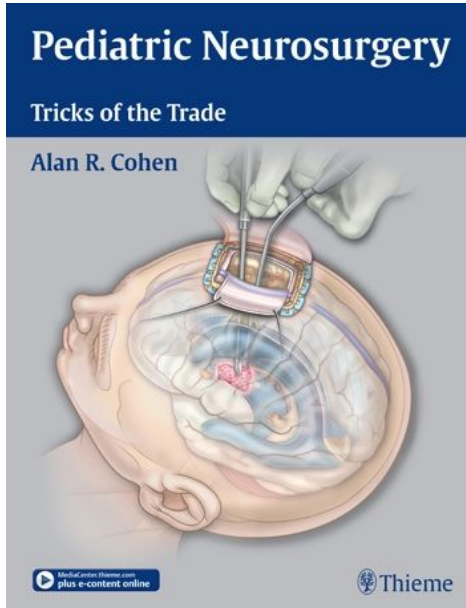
# Skull Base Neurosurgery

- Skull base neurosurgery is a highly specialized, minimally invasive surgical technique for treating growths located on the underside of the brain, the base of the skull and the upper vertebrae of the spinal column.
- Skull base surgeons use special instruments inserted through the nose or mouth to operate instead of opening up the skull.





# Pediatric Neurosurgery



- Pediatrics is the study of children.
- Pediatric neurosurgeons are different from others because they deal with children. Children's bodies are smaller than those of adults, increasing the difficulty that the doctors face.
- Pediatric neurosurgeons perform multiple procedures on their patients, therefore, they must know about both neurosurgery and pediatrics.
- They treat everything from birth defects to traumatic head injuries to severe forms of epilepsy.



Now that you have been introduced to different types of neurosurgeries, it's time to quickly test what you've learned!

Your instructor will show you a picture and/or video of a surgery. Each time, you must try to identify its name in the “Matching Activity” page of your SciNotebook!



Time for one last activity to wrap things up!

In groups of 3-4, research one type of neurosurgery that interests you the most.

Prepare a quick presentation reflecting your research.

Your instructor will walk you through the criteria needed for this presentation.



Congratulations on completing the “Neurosurgery: An Introduction” Workshop! Let’s end off with some discussion questions.

- What was your favorite surgery? Why?
- What was one new thing you learned today about your surgery?
- Make-up a scenario in which a person needs to have surgery. Provide context, the surgery name, and how it would be performed.