Normal Anatomy:
The human spine consists of 32 vertebrae, which are separated by discs. The disc is a tough fibrous shock-absorbing pad that consists of two layers. The outer layer is a stronger more rigid ring (annulus fibrosus) that works to contain the inner layer, which is gel-like substance (nucleus pulposus). Nerves exit from the spinal cord through passageways that pass between the vertebrae and these discs.

Herniated Disc:
Herniation occurs when the outer layer of the disc or the annulus fibrosus wears out and cracks or breaks open. This allows the gel substance or nucleus pulposus to push out. Some disc herniations can occur without symptoms but problems arise when the gel substance pushes against the nerves that are traveling between the discs and vertebrae. Causes of cervical disc herniation include but are not limited to: trauma such as whiplash, poor posture, repeated micro-traumas caused by things such as lifting improperly, or normal disc degeneration due to age, which can lead to instability or loose ligaments.

Cervical Herniated Disc:
The uppermost 7 vertebrae in the spine are known as cervical vertebrae. These are the vertebrae that comprise your neck. If the herniation occurs in this region of the spine and compresses a nerve then the following symptoms can occur: change in sensation in the arm, pain in the arm and hand, and muscle weakness. The pain can intensify with certain position or movement of the neck, which put more pressure on to the compressed nerve. The two most common levels in the cervical spine to herniate are the C5-C6 level and the C6-C7 level. An MRI is the diagnostic test of choice to confirm a cervical herniated disc.

Symptoms:
Symptoms of a cervical herniated disc depend on the level of the injured disc. Below is a list of common symptoms with each level. This list is not all inclusive and you must understand that every individual is different and your symptoms may not follow exactly to a specific pattern.

• C4-C5 (C5 Nerve) - weakness in the deltoid muscle in the upper arm and shoulder pain
• C5-C6 (C6 Nerve) - weakness in the biceps and wrist extensor muscles, numbness, tingling, and pain can radiate to
the forearm and thumb side of the hand or between the shoulder blades

- C6-C7 (C7 Nerve) - weakness in the triceps and the finger extensor muscles, numbness, tingling, and pain can radiate down the triceps and into the back of the middle finger
- C7-T1 (C8 Nerve) - weakness with handgrip numbness, tingling, and pain can radiate down the arm to the little finger side of the hand.

**Treatment:**

Herniated discs can often be managed without surgery. Physical therapy is an on-surgical treatment for cervical herniated discs. Physical therapy methods are used to decrease pain, increase neck flexibility, and increase stabilization. Advanced disc herniation can be treated with steroid injections. Some treatment methods include, but are not limited to:

- **Modalities:** including electrical stimulation, hot packs cold packs, TENS and ultrasound are used to decrease pain, muscle spasm, and inflammation and to increase tissue laxity
- **Manual therapy:** including joint mobilization, manual traction, and stretching are used to increase flexibility and joint mobility in the neck.
- **Massage:** used to relax tissues and release areas of tension
- **Exercise:** used to increase strength, stability, and flexibility in the cervical spine. Also helps to improve posture
- **Traction:** used to decrease tension in the neck and helps to open up the space to decrease nerve compression by the disc.

In four to six weeks, the majority of patient find their symptoms can be relieved without surgery. According to the spine universe website, only 5% of back problems require surgical interventions.