

Science Education Collection

# Neck Exam

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## Overview

Source: Robert E. Sallis, MD. Kaiser Permanente, Fontana, California, USA

Examination of the neck can be a challenge because of the many bones, joints, and ligaments that make up the underlying cervical spine. The cervical spine is composed of seven vertebrae stacked in gentle C-shaped curve. The anterior part of each vertebra is made up of the thick bony body, which is linked to the body above and below by intervertebral discs. These discs help provide stability and shock absorption to the cervical spine. The posterior elements of the vertebra, which include the laminae, transverse, and spinous processes and the facet joints, form a protective canal for the cervical spinal cord and its nerve roots.

The cervical spine supports the head and protects the neural elements as they come from the brain and from the spinal cord. Therefore, injuries or disorders affecting the neck can also affect the underlying spinal cord and have potentially catastrophic consequences. The significant motion that occurs in the neck places the cervical spine at increased risk for injury and degenerative changes. The cervical spine is also a common source of radicular pain in the shoulder. For this reason, the neck should be evaluated as a routine part of every shoulder exam.

## Procedure

When examining the neck, it is important to have the patient remove enough clothing so that the entire neck and upper shoulders can be seen and palpated.

### 1. Inspection

1. Look at the neck from behind starting from the base of the skull and down to the upper back. There should be near perfect symmetry and the head should sit in the midline. Tilting to one side may suggest muscle spasm, such as with torticollis.
2. Observe the form and bulk of the paraspinous muscles that surround the midline spinous processes. There may be asymmetry here due to spasm related to trauma or to the overuse injury involving these powerful neck muscles.
3. Inspect the neck from the lateral side and observe the smooth lordotic (reverse C-shape) curve. A loss of this curve is commonly seen as a non-specific reaction to any kind of cervical injury or pain. A more dramatic straightening of the cervical spine can be seen with ankylosing spondylitis.

### 2. Palpation

Palpation over the neck should be done using the tips of the index and middle fingers to check tenderness, muscle spasm or a subtle underlying bony deformity. Most commonly this is done with the patient in the sitting position. Important areas that should be palpated include:

1. Spinous Processes
  1. Start palpation at the base of the skull in the midline of the neck. The first process to be felt is that of the C2 vertebra.
  2. Palpate downwards, inspecting each process until you reach to the C7 vertebra, which is the most prominent of all the spinous processes.
  3. Check for tenderness or an abrupt step off from one process to the next. Tenderness may suggest a contusion or underlying fracture, while a step off may indicate a fracture or ligament disruption.
2. Posterior Facet Joints: Palpate by moving your fingers a few centimeters to the left or right of the each spinous process. Tenderness over these joints may suggest osteoarthritis or even fracture.
3. Paraspinous Muscles: Palpate along either side of the spinous processes and overlie the facet joints. Tenderness or spasm can be due to muscle injury or involuntary reaction to pain coming from the underlying cervical spine.

### 3. Range of Motion (ROM)

Neck ROM should be assessed with the patient seated. It should first be done actively by the patient or passively (gently) if the patient is unable to move. Important neck motions to assess include:

1. Forward flexion (45°): Ask the patient to move the chin to the chest.
2. Extension (55°): Ask the patient to put the chin in the air.
3. Twisting (70° each direction): Assess by asking the patient to first put the chin on one shoulder and then the other and compare between the sides.
4. Side bending (40° each way): Assess by asking the patient to first put the ear on one shoulder and then to the other and compare between the sides

## 4. Strength Testing

Each of the above ranges of motions should be tested against resistance by the examiner place a hand against the patient's chin and face to resist motion. This is done to evaluate for pain or weakness. The following motions should be tested against resistance:

1. Forward flexion: Place your hand on the patient's forehead to resist the motion and ask the patient to touch the chin to the chest (tests both sternocleidomastoid muscles)
2. Extension: Place your hand on the back of the patient's head to resist the motion and ask the patient to raise the chin in the air (tests posterior paraspinal muscles).
3. Twisting (both left and right): First place your hand on the left side, and then the right side of the patient's chin to resist the motion, and ask the patient to first put the chin on one shoulder and then the other (tests the left and right sternocleidomastoid muscles).
4. Side bending (both left and right): First place your hand on the left side, and then the right side of the patient's head to resist the motion, and ask the patient to first put the ear on one shoulder and then to the other (tests the left and right scalene muscles).

## 5. Atlanto-axial Compression Test (Spurling's test)

Perform the test by having the patient rotate the head to one side and applying an axial load to the top of head while the neck is twisted . Radicular pain to the ipsilateral shoulder and arm suggests cervical nerve root irritation.

## 6. Forward Flexion Test

Have the patient forward flex the neck with the head turned toward side. Radicular pain to ipsilateral arm suggests disc impingement on a cervical nerve root.

## 7. Neurologic Exam

Perform motor and sensory testing of the nerves exiting the cervical spinal canal. A loss of function could be due to nerve injury or a dysfunction related to a herniated disc.

## 8. Check for the following:

1. Sensation  
Lightly touch the patient over the following areas with your fingertips comparing one side to the other for changes in sensation:
  1. Lateral neck (tests C4 nerve root),
  2. Deltoid muscle (tests C5 nerve root),
  3. Medial arm and elbow (T1 dermatome)
  4. Hand (specifically at the thumb, middle and pinky fingers): radial, median and ulnar nerves.
2. Muscle strength by resisting the following motions:
  1. Shoulder abduction with elbows bent (deltoid muscle) - ask the patient to raise both arms to the sides with the elbows bent, while you are pushing down on the elbows.
  2. Elbow flexion (biceps) - have the patient flex the elbow while you grasp the hand and try to pull it down.
  3. Elbow extension (triceps) - resist the elbow extension by having the patient bend the elbow and then try to extend it while you push against the patient's hand
3. Wrist flexion and extension (wrist flexor and extensors) - ask the patient to flex and extend the wrists (point fingers towards the floor and then to the ceiling with palms down) while you are grasping the patient's hands and resisting the motion.
4. Tendon reflexes: the following should be assessed using a reflex hammer:
  1. Biceps tendon reflex: tap the hammer briskly against your thumb placed over the distal biceps tendon. Lack of reflex suggests dysfunction of the C5 nerve root.
  2. Triceps tendon reflex: tap the hammer briskly over the distal triceps tendon. Lack of reflex suggests dysfunction of the C7 nerve root.

## Summary

Examination of the neck is best performed in a sitting or standing position, and should follow a stepwise approach. It is important to have the patient remove enough clothing so that the surface anatomy of the neck and shoulders can be seen. The exam should begin with inspection, looking for a lack of symmetry. This is followed by palpation, looking for tender spots or an abnormal step off between the vertebrae. Next, range of motion is assessed, first actively and then against resistance to assess the strength. Finally, one should evaluate for nerve root impingement caused by abnormal disc or bone, using the Spurling's and forward flexion tests. This is followed by examination for sensory or motor loss in the cervical nerve roots.