CERVICAL SPINE: MUSCLE LAYERS

1. Superficial Layer: [Muscles of the Upper Limb] Trapezius and Sterno Cleido Mastoid

2. Splenius and Levator Scapulae:
   Splenius Capitis
   Splenius Cervicis
   Levator Scapulae

3. Semispinalis
   Medially
   Semispinalis Capitis
   Semispinalis Cervicis
   Laterally
   Transversus Thoracis
   Longissimus Thoracis
   Iliocostalis (Superior Portion)

4. Deep Layer
   Suboccipital Group
   Rectus Major
   Rectus Minor
   Superior Oblique
   Inferior Oblique
   Cervical Transverso-Spinalis
   Interspinous Muscles
Anatomically, these muscles can also be grouped according to their positional relationship to the spine, such as postvertebral, prevertebral, and lateral muscles of the neck.


structure accomplish this movement. The muscles involved in producing tension, flexion, rotation, and lateral bending of the neck and head are as follows.

Extension
- Splenius capitis
- Splenius cervicis
- Semispinalis capitis
- Semispinalis cervicis
- Longissimus capitis
- Longissimus cervicis
- Trapezius
- Interspinalis
- Rectus capitis posterior major
- Rectus capitis posterior minor
- Obliquus capitis superior
- Sternocleidomastoid (posterior fibers)

Flexion
- Sternocleidomastoid (anterior fibers)
- Longus colli
- Longus capitis
- Rectus capitis anterior

Rotation and Lateral Flexion
- Sternocleidomastoid
- Scalene group
- Splenius capitis
- Splenius cervicis
- Longissimus capitis
- Levator scapulae
- Longus colli
- Iliocostalis cervicis
- Multifidi
- Intertransversarii
- Obliquus capitis inferior
- Obliquus capitis superior
- Rectus capitis lateralis

SUBOCCIPITAL MUSCLES

The suboccpital muscles are used for fine tuning motions of the head and neck.

The four muscles of the suboccpital triangle are arranged as follows...

Two muscles from the tips of the spinous process to the nuchal line at the base of the skull. The shorter one, the uniaricular muscle, RECTUS CAPITIS POSTERIOR MINOR [Rectus Minor - #2] runs from the spinous process of the atlas superiorly and slightly laterally. The slightly longer, the biaricular muscle, RECTUS CAPITIS POSTERIOR MAJOR, [Rectus Major - #1] runs from the spinous process of the axis superiorly and slightly laterally.

Two "oblique" muscles the superior and inferior. The OBLIQUUS CAPITIS INFERIOR [Inferior Oblique - #3] attaches from the lateral side of spinous process of the axis [C2] and runs upwards and laterally to attach to the spinous process of the atlas [C1]. The OBLIQUUS CAPITIS SUPERIOR [Superior Oblique - #4] attaches to the transverse process of the atlas [C1] and runs upwards to attach to the base of the skull.


Dr. A. Sollme, 1896
Vertebral Column: **SUBOCCIPITAL TRIANGLE**

**ACTION OF THE SUBOCCIPITAL MUSCLES**

The Oblique Capitis Inferior [3]: Maintains the spatial relationship of the atlanto-axial joint (between the Atlas and Axis composed of three (Atlanto-Odontoid and the bilateral atlanto-axial joints) anatomically and mechanically linked joints). When both concentrically contracts (fig 78 side view & fig 79 superior view) they pull back and extend the atlas on the axis. When both muscles concentrically contract they relax the tension in the transverse ligament (fig 79- ligament not shown).

The lines of action of the suboccipital muscles are posterior to the axis of flexion and extension.

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Dr. A. Solimone, 1996
Unilateral concentric contraction of the four suboccipital muscles results in lateral flexion at the atlanto-occipital joint. (Fig 80) In order to produce lateral flexion, the inferior oblique [3] must stabilize the atlas so that the superior oblique muscle may rotate the head laterally (produce lateral flexion). The superior oblique [4] has the greatest mechanical advantage (i.e. has the longest lever arm) of the suboccipital muscles. The rectus major [1] and rectus minor [2] lying close to the midline do not have as great mechanical advantage as the superior oblique.
EXTENSION


AXIAL ROTATION

Atlanto-Occipital Joint

At the atlanto-occipital joint, the Superior Oblique [4] rotates the head contralaterally (i.e. the left Superior Oblique will rotate the head to the right). Fig 82

Atlanto-Axial

The Rectus Major [3] and the Inferior Oblique [1] will rotate the head ipsilaterally (i.e. to the same side).
Figure 4.14. Suboccipital region.
the *rectus obliquus obliquus a the vertebral artery as lies the dorsal spinal mentioned posterior

A Occipital and nuchal regions; left: subcutaneous layer right: subfascial layer

B Suboccipital triangle