

# Musculoskeletal Mechanics of the head region

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## 1 Osteokinematics

### 1.1 Head Lateral SB

Muscle	Origin	Insertion	Nerve	Action
Sternocleidomastoid	<b>Sternal head:</b> sternum (manubrium); <b>Clavicular head:</b> Clavicle (medial 1/3)	Temporal bone (mastoid process); Occipital bone (superior nuchal line)	<b>Motor:</b> CN XI <b>Accessory n. and Proprioception:</b> Cervical plexus (C2, C3, C4)	<b>Unilateral:</b> Tilts head to same side, rotates head to opposite side; <b>Bilateral:</b> Extends head, aids in respiration when head is fixed
I/L SB Obliquus Capitis Superior	C1 (TP)	Occipital bone (inferior nuchal line, middle third)	Suboccipital N.	<b>BIL:</b> Extend head; <b>UNIL:</b> I/L SB, C/L rotation

## 1.2 Head rotation

Muscle	Origin	Insertion	Nerve	Action
C/L head rotators				
Obliquus Capitis Superior	C1 (TP)	Occipital bone (inferior nuchal line, middle third)	Suboccipital N.	<b>BIL:</b> Extend head; <b>UNIL:</b> I/L SB, C/L rotation
Sternocleidomastoid	<b>Sternal head:</b> sternum (manubrium); <b>Clavicular head:</b> Clavicle (medial 1/3)	Temporal bone (mastoid process); Occipital bone (superior nuchal line)	<b>Motor:</b> CN XI Accessory n. and <b>Proprioception:</b> Cervical plexus (C2, C3, C4)	<b>Unilateral:</b> Tilts head to same side, rotates head to opposite side; <b>Bilateral:</b> Extends head, aids in respiration when head is fixed
I/L Head Rotators				
Rectus Capitis Posterior Major	C2 (SP)	Occipital bone (inferior nuchal line, middle third)	Suboccipital N.	<b>BIL:</b> Extend head; <b>UNIL:</b> I/L head rotation
Rectus Capitis Posterior Minor	C1 (posterior tubercle)	Occipital bone (inferior nuchal line, inner 1/3)	Suboccipital N.	<b>BIL:</b> Extend head; <b>UNIL:</b> I/L head rotation
Obliquus Capitis Inferior	C2 (SP)	C1 TP	Suboccipital N.	<b>BIL:</b> Extend head; <b>UNIL:</b> I/L rotation

## 1.3 Head Extension

Muscle	Origin	Insertion	Nerve	Action
Rectus Capitis Posterior Major	C2 (SP)	Occipital bone (inferior nuchal line, middle third)	Suboccipital N.	<b>BIL:</b> Extend head; <b>UNIL:</b> I/L head rotation
Rectus Capitis Posterior Minor	C1 (posterior tubercle)	Occipital bone (inferior nuchal line, inner 1/3)	Suboccipital N.	<b>BIL:</b> Extend head; <b>UNIL:</b> I/L head rotation
Obliquus Capitis Superior	C1 (TP)	Occipital bone (inferior nuchal line, middle third)	Suboccipital N.	<b>BIL:</b> Extend head; <b>UNIL:</b> I/L SB, C/L rotation
Obliquus Capitis Inferior	C2 (SP)	C1 TP	Suboccipital N.	<b>BIL:</b> Extend head; <b>UNIL:</b> I/L rotation
Sternocleidomastoid	<b>Sternal head:</b> Sternum (manubrium); <b>Clavicular head:</b> Clavicle (medial 1/3)	Temporal bone (mastoid process); Occipital bone (superior nuchal line)	<b>Motor:</b> CN XI Accessory n. and <b>Proprioception:</b> Cervical plexus (C2, C3, C4)	<b>Unilateral:</b> Tilts head to same side, rotates head to opposite side; <b>Bilateral:</b> Extends head, aids in respiration when head is fixed