

**Cervical Diagnosis - Occipitoatlantal (OA) joint**

**Possible diagnoses**

<b>Diagnosis</b>	<b>Sulci findings</b>	<b>Translation findings</b>	<b>Findings with flexion and extension</b>
OA FS <sub>L</sub> R <sub>R</sub>	Left sulcus is shallow and right sulcus is deep	Easier to translate to the right	Translation and sulci findings are more equal with flexion
OA FS <sub>R</sub> R <sub>L</sub>	Right sulcus is shallow and left sulcus is deep	Easier to translate to the left	Translation and sulci findings are more equal with flexion
OA ES <sub>L</sub> R <sub>R</sub>	Left sulcus is shallow and right sulcus is deep	Easier to translate to the right	Translation and sulci findings are more equal with extension
OA ES <sub>R</sub> R <sub>L</sub>	Right sulcus is shallow and left sulcus is deep	Easier to translate to the left	Translation and sulci findings are more equal with extension



**Brief description:** To diagnosis the OA you will need to palpate thru the suboccipital muscles of the posterior neck. Feel for which side is shallow to determine the direction of sidebending and then check for flexion and extension. To complete the diagnosis, rotation will be in the opposite direction of sidebending due to the mechanics of the OA joint.

**Look (observation):** Observe the area for any abnormalities in posture, trauma, redness, or swelling.

**Feel (palpation):**

**Physician position:** Standing at the head of the table

**Patient position:** Supine

**Hand positioning:** Place your fingers on the occiput and slide your fingers down until they sink into the suboccipital muscles.

**Technique:**

1. Sink your fingers into the suboccipital muscles and determine which side feels shallow versus deep by trying to translate in the anterior/posterior direction (push your fingers toward the ceiling). The shallow side is the direction of sidebending while the deep side is the direction of rotation.
2. Testing may also be done by translating the OA to the right and left. When translating to the right the OA will sidebend to the left and vice versa.
3. To check flexion and extension, keep your fingers in the suboccipital sulcus and place the head in a neutral position.
4. Now gently flex the head and extend the head while trying to feel for which motion makes the area under your fingers more even or equal (you should not feel like one side is shallow or deep; if translating to the right and left, it should feel like no one direction is easier).
5. The direction that feels most equal is freedom of motion.
6. To name the dysfunction you will use freedoms of motion. (Ex. If you feel that the left side is shallow, the right side is deep and it feels more equal in flexion, the diagnosis will be OA FS<sub>L</sub>R<sub>R</sub>.)

**Move (motion testing)**

**Active motion testing:**

1. Ask the patient to touch their chin to the chest and to tip their head as far back as possible. This will test flexion and extension, respectively.
2. Ask the patient to turn their head as far to the right and left as possible to test for rotation.
3. Ask the patient to try and touch their ear to their shoulder without lifting their shoulder. Do this bilaterally to check for sidebending.

### **Passive motion testing:**

1. Place your hand on the top of the patient's head for control and place the head into it's anatomical barriers for flexion, extension, rotation to the right and left, and sidebending to the right and left.

Other notes: When diagnosing, notice that the rotation and sidebending components of diagnosis are always opposite due to the physiologic motion at the OA joint and the anatomy. To remember this, use the mnemonic **OA is Opposite Always**. Also, to remember which side is the side of sidebending, feel for the side that is shallow when you palpate thru the suboccipital muscles. To remember this, use the mnemonic **Shallow is Sidebent**.

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## **Cervical Diagnosis - Atlantoaxial (AA) joint**

### **Possible diagnoses: AA R<sub>R</sub>, AA R<sub>L</sub>**



**Brief description:** The motion at the AA joint is rotation. When testing the AA joint it is important to lockout the vertebrae below the AA joint in order to test the rotation purely at the AA joint. To accomplish this, you will need to flex the head and neck up before testing rotation of the head.

**Look (observation):** Observe the area for any abnormalities in posture, trauma, redness, or swelling.

**Feel (palpation):**

**Physician position:** Standing at the head of the table

**Patient position:** Supine

**Hand positioning:** Place your hands so that you can properly support the head as you lift the head and rotate it.

### **Technique:**

1. Place your hands under the patient's heads so that your fingers are on the posterior aspect of the head and your thumbs are in front of the ears.
2. Lift the patient's head off the table until you cannot flex the head anymore, in order to lock out the lower cervical spine.
3. Test for rotation by moving the head to the left and right. Use the nose to help gauge how far the head turns in each direction.
4. To name the dysfunction, you will use the freedom of rotation. (Ex. If the head is able to rotate more to the right, the diagnosis would be AA R<sub>R</sub>.)

### **Move (motion testing)**

#### **Active motion testing:**

1. Ask the patient to turn their head as far to the right and left as possible to test for rotation. (Note: This will not test pure AA joint motion because the lower cervical spine is not locked out.)

#### **Passive motion testing:**

1. Place your hands under the patient's heads so that your fingers are on the posterior aspect of the head and your thumbs are in front of the ears.
2. Lift the patient's head off the table until you cannot flex the head anymore, in order to lock out the lower cervical spine.
3. Test for rotation by moving the head to the left and right. Use the nose to help gauge how far the head turns in each direction.

**Other notes:** The head should be flexed up to at least 45 degrees, but you may need to flex more to lock out the lower cervical vertebrae so that they do not contribute to the rotation.

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## Cervical Diagnosis - C2 – C7 vertebrae

### Possible diagnoses

<b>Diagnosis</b>	<b>Anterior-Posterior (A-P) findings</b>	<b>Translation findings</b>	<b>Findings with flexion and extension</b>
FRS <sub>R</sub>	Pushing up towards the ceiling, the right side feels more shallow and resistance is felt on the right side sooner than left	Pushing the articular pillar from right to left is easier	Translation and A-P findings are more equal with flexion
FRS <sub>L</sub>	Pushing up towards the ceiling, the left side feels more shallow and resistance is felt on the left side sooner than right	Pushing the articular pillar from left to right is easier	Translation and A-P findings are more equal with flexion
ERS <sub>R</sub>	Pushing up towards the ceiling, the right side feels more shallow and resistance is felt on the right side sooner than left	Pushing the articular pillar from right to left is easier	Translation and A-P findings are more equal with extension
ERS <sub>L</sub>	Pushing up towards the ceiling, the left side feels more shallow and resistance is felt on the left side sooner than right	Pushing the articular pillar from left to right is easier	Translation and A-P findings are more equal with extension



### **Picture of related anatomy**

**Brief description:** In order to diagnosis the cervical vertebra 2 thru 7, you must palpate the articular pillar. By using translation to the right and left, as well as feeling for which pillar is posterior, you can determine the sidebending and rotation, respectively, of the cervical vertebrae. In addition, flexion and extension is determined by which motion makes the sidebending and rotation components of motion more symmetrical.

**Look (observation):** Observe the area for any abnormalities in posture, trauma, redness, or swelling.

**Feel (palpation):**

**Physician position:** Standing at the head of the table

**Patient position:** Supine

**Hand positioning:** Place your finger pads on the articular pillars of the cervical vertebra you are testing.

**Technique:**

1. Palpate the articular pillars bilaterally and determine which side is more posterior by applying an upward force towards the ceiling. The side that you feel resistance on sooner is the side that is posterior and is the freedom of rotation.
2. Another method that may be used is translation. Again, find the articular pillars and apply a force from right to left to induce right sidebending and left to right to induce left sidebending. The direction that is easier to translate towards determines the freedom of sidebending.
3. Using either method (step 1 or 2), test the same method in flexion and extension.
4. To test flexion, lift the head up and assess for rotation and sidebending. Look for a feeling of symmetry. If rotation and sidebending do not feel symmetrical in flexion, try extending the head and again test rotation and sidebending while looking for symmetry.
5. To name the dysfunction, you will use the freedoms of motion and the cervical level you are at. (Ex. If you are at the level of C4, felt the right side is more posterior while translation was easier going from right to left and the motions felt more symmetrical or equal in flexion, the diagnosis would be C4 FRS<sub>R</sub>.)

## **Move (motion testing)**

### **Active motion testing:**

1. Ask the patient to touch their chin to the chest and to tip their head as far back as possible. This will test flexion and extension, respectively.
2. Ask the patient to turn their head as far to the right and left as possible to test for rotation.
3. Ask the patient to try and touch their ear to their shoulder without lifting their shoulder. Do this bilaterally to check for sidebending.

### **Passive motion testing:**

2. Place your hand on the top of the patient's head for control and place the head into its anatomical barriers for flexion, extension, rotation to the right and left, and sidebending to the right and left.

**Other notes:** It is important to remember that for C2-C7 the motions of rotation and sidebending are coupled to the same side. This means that if rotation is to the right, sidebending will also be to the right. Also, when flexing and extending the spine, only flex and extend to the vertebra you are testing.

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