Body posture for Cervical Spine Radiography

- High-accuracy spinal alignment monitoring using the head angle and visual distance in computer users
- Nazheng stretch-rotation manipulation in the treatment of atlantoaxial subluxation in children: A case report
- Exploratory Cluster-Based Radiographic Phenotyping of Degenerative Cervical Disorder: A Retrospective Study
- Correlation analysis between neck muscles and lifestyle habits in patients with cervical instability
- The Relationship Between the Clavicular Tilt Angle and Sagittal Spinal Alignment Associated With Hyperkyphosis Posture
- The impact of craft type on operational spine postures in military boat operators
- The Coronal and Sagittal Vertebral Balance is Affected by the Severity of the Disease in Pediatric Patients with Cystic Fibrosis: A Pulmonary Function Test-Based Cross-Sectional Study
- Head Posture and Upper Spine Morphological Deviations in Patients With Hypermobile Ehlers-Danlos Syndrome

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For cervical spine radiography, proper patient positioning is crucial to obtain diagnostic-quality images while minimizing radiation exposure and patient discomfort. The positioning varies depending on the specific view required.

Standard Cervical Spine Views and Their Positioning

1. AP (Anteroposterior) View:

Patient stands or lies supine.

Head is positioned so that the occlusal plane (upper teeth) is aligned with the base of the skull.

Chin is slightly elevated to avoid superimposition of the mandible on the cervical vertebrae.

Central ray is directed to C4 (level of thyroid cartilage).

Arms are relaxed at the sides.

2. Lateral View (Left or Right Lateral Projection)

Preferred view for assessing alignment, fractures, or soft tissue swelling.

Patient stands or sits in true lateral position with shoulders relaxed.

Chin is slightly elevated to avoid superimposition of the mandible on the spine.

Central ray is directed to C4 (mid-cervical spine).

Expiration phase is used to relax the shoulders for better visualization of lower cervical vertebrae.

If necessary, patient can hold weights in hands to depress the shoulders.

3. Odontoid (Open-Mouth) View:

Used to visualize the atlantoaxial joint (C1-C2) and odontoid process.

Patient opens the mouth as wide as possible.

Head is positioned so that the occlusal plane is perpendicular to the imaging receptor.

Central ray is directed through the open mouth at C2.

Care is taken to avoid movement to prevent blurring.

4. Oblique Views (Right and Left Anterior or Posterior Oblique)

Used to assess intervertebral foramina.

Patient is rotated 45 degrees from the AP or PA position.

Chin is slightly elevated to avoid mandible superimposition.

Central ray is directed to C4 at a 15-20° cephalad (for posterior oblique) or caudad (for anterior oblique) angle.

5. Swimmer’s View (Cervicothoracic Lateral)

Used when C7-T1 junction is not visible on the standard lateral view.

One arm is raised above the head, and the opposite arm is depressed.

Central ray is directed to C7-T1 interspace.

Often used in trauma cases.

Trauma Considerations

If cervical spine injury is suspected, the lateral cross-table view should be performed first without moving the patient. A cervical collar should remain in place until clearance is given. Additional CT or MRI may be required for better assessment.

Cervical sagittal balance parameters are an important aid in surgical decision-making and influence outcome in cervical spine surgery. In current literature, the normative values of these parameters vary highly within and between patients. This variability might be attributed to body posture.

The primary aim is to review the literature on the influence of body posture, including studies that compare sitting or standing positions possibly varying in arm positions, on cervical alignment measured in the sagittal plane on Cervical Spine Radiography.

A systematic review was performed.

PubMed, Embase, Cochrane Library, Web of Science, and CINAHL were systematically searched for articles published up to and including May 2024. The primary outcome was variability in cervical alignment in the sagittal plane as measured in altering body postures on X-rays. Quality of the included articles was assessed with the QUADAS-2 tool.

Out of 17,628 screened articles, eight were eligible for inclusion. Articles were excluded based on irrelevant outcomes (n= 10,372), duplicates (n= 4,315), wrong study design (n= 1,462), or the influence of body posture was not described (n= 612). Overall cervical alignment ranged from 33.3 degrees lordosis to 3.5 degrees kyphosis. In all studies, statistically significant differences in T1 Slope (T1S), C2C7 Sagittal Vertical Axis (SVA), McGregor Slope (McGS), or C7 SVA were observed with respect to body posture. The observed differences between postures for cervical alignment ranged from 1 to 16.6 degrees.

Body posture significantly influences cervical alignment values measured in the sagittal plane on X-rays. Studies investigating this influence are scarce and vary highly in investigated body postures. Standardization of body posture is imperative to enable optimal comparison of cervical sagittal balance parameters within and between patients, but also between studies. Moreover, the high variability observed raises questions about the comparability of measured values in previously published studies [1)].

Standing radiograph

Standing radiograph.

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van Santbrink E, Schuermans V, Goor AV, de Bie R, Boselie T, van Santbrink H, Smeets A. The influence of body posture on cervical alignment measured in the sagittal plane on conventional radiographs: A systematic review. Spine J. 2025 Jan 29:S1529-9430(25)00074-9. doi: 10.1016/j.spinee.2025.01.037. Epub ahead of print. PMID: 39890026.