

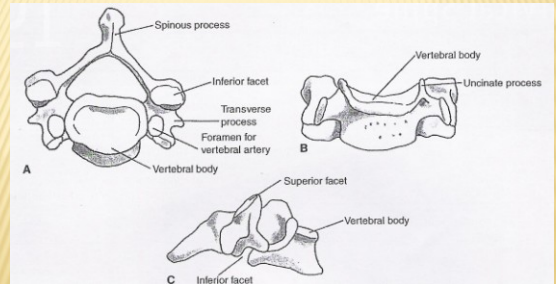
CERVICAL SPINE

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台北榮總骨科物理治療
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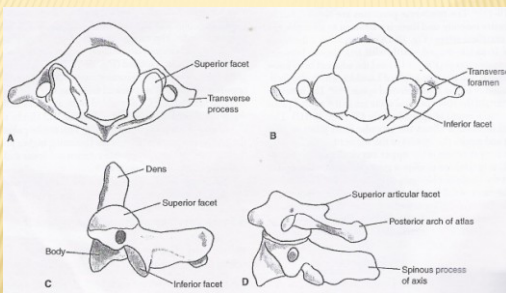
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LOWER C SPINE



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UPPER C SPINE



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LIGAMENTS IN C SPINE

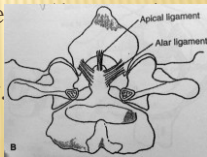
- ✗ ALL: limit extension, reinforce ant. disc
- ✗ PLL: limit flexion, reinforce ant. disc
- ✗ Ligamentum flavum: limit flexion, reinforce ant. disc
- ✗ Ligamentum nuchae: limit flexion



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LIGAMENTS IN UPPER C SPINE

- ✗ Alar ligament: C1-C2, limit rot. to the same side and sb. to the opposite side
- ✗ Apical ligament: dens-occipital condyles, prevent flexion
- ✗ Transverse ligament
- ✗ Anterior atlantoaxial lig.
- ✗ Tectorial membrane=PLL
- ✗ Posterior atlantoaxial=LF



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JOINT MECHANICS-LOWER C (C2-T1)

- ✗ Close-packed position: extension
- ✗ Superior glide of facet j. when flexion.
- ✗ Inferior glide of facet j. when extension.
- ✗ Rotation and sidebend to the same side.
- ✗ Why is C spine slightly lordosis?

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JOINT MECHANICS-UPPER C (C0-C1-C2)

- ✗ Rotation and sidebend to the opposite side.

	Lower C	C0-C1	C1-C2
Rotation to R't	slight extension rot. and sb. to R't	Slight flexion sb. to L't	rot. to R't
Side flexion to R't	Slight extension rot. and sb. to R't	sight flexion sb. to R't	rot. to L't

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HEADACHE TECHNIQUE

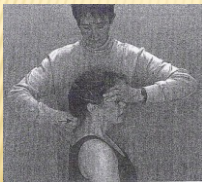
- ✗ Joint integrity
- 2. for C0-C1 hypomobility



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HEADACHE TECHNIQUE

- ✗ Joint integrity
- 1. for C1-C2 hypomobility (sitting)



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HEADACHE TECHNIQUE

- ✗ Joint integrity
- 3. for C1-C2 hypomobility (supine)



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HEADACHE TECHNIQUE

- ✗ Joint integrity
- 4. Transverse shear of C0-C1



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HEADACHE TECHNIQUE

- ✗ Active physiologic joint movement
- Rotation: (1) full flex→C1-C2
- (2) chin tuck →C2-C3
- (3) full extend
- below C3



(1)

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HEADACHE TECHNIQUE

- ✗ Passive physiologic joint movement
- 1. Upper C flexion
- 2. Sidebending
- 3. Upper C extension
- 4. Upper C quadrant : ext.+ rot.+ sb.

Upper C extension



Upper C quadrant

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HEADACHE TECHNIQUE

- ✗ Passive physiologic intervertebral movements (PPIVMs)



Distraction of C0-C1



Sidebending of C0-C1

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HEADACHE TECHNIQUE

- ✗ Passive physiologic intervertebral movements (PPIVMs)



C1-C2 rotation



Sidebending of lower C

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TREATMENT TECHNIQUES- MYOFASCIAL MANIPULATION

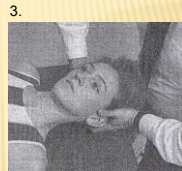
- ✗ Bilateral suboccipital release
- P: supine
- O: seated, fingers on the inf. nuchal line
- patient' s occiput.
- M: long axis distraction



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TREATMENT TECHNIQUES- JOINT MOBILIZATION TECHNIQUES

- ✗ Craniovertebral region
- 1. Extension of C0-C1
- 2. Flexion of C0-C1
- 3. Sidebending of C0-C1
- 4. Rotation of C1-C2



3.



1.



2.



4.

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TREATMENT TECHNIQUES- JOINT MOBILIZATION TECHNIQUES

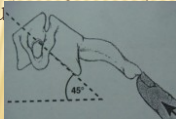
- 5. Transverse vertebral movement of C1-C2
- P: prone, head rot. 30°
- O: both thumb pads on C2 articular pillar
- M: oscillatory movement translate from thumbs, increase C1-C2



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**TREATMENT TECHNIQUES-
JOINT MOBILIZATION TECHNIQUES**

- 1. PA vertebral central vertebral oscillations
- P: prone, head slightly flexion
- O: tips of both thumbs placed on the tip of the spinous process
- M: graded oscillation for the articulation plane



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**TREATMENT TECHNIQUES-
JOINT MOBILIZATION TECHNIQUES**

- 3. Segmental extension of the C2-C7 segments
- P: prone, head slight extension
- O: thumbs at the facet j. or SP
- M: parallel to the plane of cervical facet j.



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**TREATMENT TECHNIQUES-
JOINT MOBILIZATION TECHNIQUES**

- 5. Rotation mobilization in sitting C2-T2
- P: sitting
- O: one hand support patient's head, stabilizing hand grade spine
- M: rotation



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**TREATMENT TECHNIQUES-
JOINT MOBILIZATION TECHNIQUES**

- 6. Lateral flexion mobilization C2-T3
- P: sitting, cervical resting position
- O: one hand stabilize lower c spine, one hand on the top of the head
- M: side flexion



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**TREATMENT TECHNIQUES-
MANUAL TRACTION TECHNIQUES**

- ✗ Supine cervical traction
- P: supine w/ c spine flexion in different degrees
- O: one hand support c spine, the other on the forehead
- M: traction by body weight of PT



C0-C1-C2



C5-C6
C7-T1

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**TREATMENT TECHNIQUES-
POSITIONAL TRACTION**

- P: supine
- O: book or pillow under head, palpate the ligament to be distracted



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TREATMENT TECHNIQUES- SELF-MOBILIZATION TECHNIQUES



A: atlanto-axial rotation

B: occipito-atlantal flexion

C: backward cervical shift

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TREATMENT TECHNIQUES- SELF-MOBILIZATION TECHNIQUES



D: forward cervical shift

E: segmental rotation (C2-C7)

F: lateral flexion of the upper C spine

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TREATMENT TECHNIQUES- SELF-MOBILIZATION TECHNIQUES



G: lateral flexion of the mid- and lower C spine

H: unilateral extension of the OA joint

I: unilateral extension of the mid C spine

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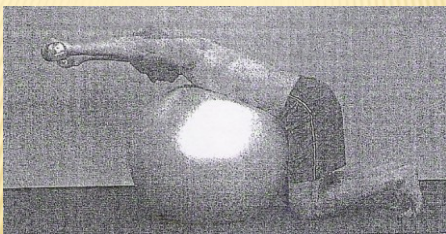
TREATMENT TECHNIQUES- CERVICAL SEGMENTAL STABILIZATION

- ✗ Antigravity strengthening of the multifidi
- P: prone w/ head off the table, top of the head resting on PT' s hand
- O: lift the head of p' t until s/he can maintain the lordosis curve of cervical



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TREATMENT TECHNIQUES- DYNAMIC CERVICOTHORACIC STABILIZATION TECHNIQUES



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COMMON DISORDERS- ACUTE LOCKING OF THE C SPINE

- ✗ Acute locking of C spine follows an ungraded movement of the neck, with instant pain over the articular pillar and an antalgic posture of lateral flexion to the opposite side and slight flexion.
- ✗ It occurs most common at C2-C3 level.
- ✗ It' s more common in child and young adult.

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**COMMON DISORDERS-
ACUTE LOCKING OF THE C SPINE**

- ✦ Many authors suggest that either disc or apophyseal joint disorder may cause locking, while others mainly implicate apophyseal joint disorders.
- ✦ If the disc bulges posteriorly, it may press PLL, the spinal cord and the nerve root.

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**COMMON DISORDERS-
CERVICAL SPONDYLOSIS/ DJD**

- ✦ Chronic and commonly progressive degeneration of cervical facet joints and the disc.
- ✦ Most common in C5-C7, >50y/o
- ✦ It is considered a normal aging process. Some of them are asymptomatic.

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**COMMON DISORDERS-
CERVICAL SPONDYLOSIS/ DJD**

- ✦ Lateral canal stenosis, which is frequently referred to as cervical spondylosis, is the second most cause of cervical radiculopathy.
- ✦ Degenerative process:
 - spurs → hypertrophy of LF
 - compress spinal cord (myelopathy)
 - foramina narrowing (radiculopathy)

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