CERVICAL MANIPULATION CLINICAL PRACTICE GUIDELINES

Clinical Practice Guidelines for Cervical Manipulation

Purpose: To provide guidelines for physical therapists for ensuring patient safety and appropriateness when considering cervical manipulation, based on the latest literature

- Progression is time and criterion-based, depending on soft tissue healing, patient demographics, and clinician evaluation.
- For questions, contact Dr. Sujan Gogu's clinic.

Proposed Benefits

1 Mechanical

1. Increases joint space
2. Enhances range of motion
3. Improves biomechanics
4. Reduces soft tissue tone

2 Psychological

- Potential psychological benefits for patients with a strong positive expectation regarding manual therapy

3 Neurophysiological

1. Modulates nerve activity in afferent fibers
2. Alters sympathetic activity
3. Elicits a hypoalgesic response
4. Enhances descending inhibition mechanisms

4 Possible Indications

- Cervicogenic headache
- Positive flexion-rotation test
- Cervical hypomobility with reproduction of concordant symptoms
- Neck pain with radiating symptoms in non-acute phase

Contraindications	
Absolute Contraindications	**Relative Contraindications**
1. Worsening neurological function 2. Upper motor neuron lesions 3. Spinal cord damage 4. Multi-level nerve root pathology 5. Persistent night pain 6. Recent relevant trauma 7. Severe, unremitting non-mechanical pain 8. Patient refusal to consent 9. Suspected cervical artery dissection	1. Hypermobility syndromes 2. Local infections 3. Osteoporosis/Osteopenia 4. Active or history of cancer 5. Age over 55 years 6. Long-term corticosteroid use 7. Inflammatory disease 8. High fear avoidance behaviors

Stages of CPR Development Derivation				
Variables	**Sensitivity**	**Specificity**	**LR+**	**Prob of Success**
3	0.81	0.94	1.00	90%
4	0.50	1.00	infinite	100%

Subjective Examination	
Category	**Details**
Mechanism of Injury	Minor mechanical trauma is commonly associated with cervical vascular issues.
Screening Questions	**Symptoms to Assess**: • Dizziness • Difficulty swallowing (Dysphagia) • Double vision (Diplopia)

Category	Details
	• Difficulty speaking (Dysarthria) • Sudden falls (Drop attacks) • Numbness • Nausea • Involuntary eye movements (Nystagmus)
Myelopathy Screening Questions	**Symptoms to Assess**: Numbness, tingling, or weakness in both limbs or all four limbs, difficulty walking, issues with fine motor skills, changes in bowel or bladder function.
General Health Questions	**Medical History**: Yearly check-ups, current medications. **Lifestyle Factors**: Smoking history, corticosteroid use. **Health Conditions**: High blood pressure.
Objective Measures	
Blood Pressure	**Importance**: Hypertension is a risk factor for cardiovascular issues and can signal potential carotid or vertebral artery disease. Evaluate in conjunction with other findings
Palpation of Carotid Artery	**When to Perform**: Only if there are abnormal subjective symptoms or abnormal blood pressure readings.
Neurological Exam	**Components**: Cranial nerve examination, upper motor neuron testing, muscle stretch reflexes, sensory exam.
Canadian C-Spine Rules	**Purpose**: Highly sensitive (0.90-1.00) for identifying cervical spine fractures
Craniovertebral Ligament Testing	**Note**: Current evidence on the predictive ability of these tests is limited. Consider whether such testing is prudent or safe based on subjective symptoms of instability.

Category	Details
Vertebral Artery Test	**Caveat**: Numerous studies question the validity of the vertebral artery insufficiency (VAI) test. Results should be interpreted in the context of all clinical findings.
Cervical Examination	**Components**: Assess range of motion, passive accessory joint mobility, and perform the flexion-rotation test.
Patient-Reported Outcome Measures	
Fear-Avoidance Belief Questionnaire (FABQ)	**Scoring**: A score <19 on the FABQ-work subscale is part of the lumbar manipulation clinical prediction rule (CPR). **Additional Insight**: Puentedura et al. included “positive expectation of manipulation benefits” in the 2012 cervical manipulation CPR, indicating that higher expectations or lower fear-avoidance may improve outcomes.
Neck Disability Index (NDI)	**Predictors**: Tseng et al. identified an initial NDI score <11.50 as one of six predictors for successful cervical manipulation.
Prior to Performing Cervical Manipulation	
Informed Consent	**Requirement**: Obtain express consent, either written or verbal, and record it in the patient’s clinical record.
Positional Testing	**Procedure**: 1. Perform a sustained pre-manipulative hold to assess patient response 2. Hold the position for 10 seconds. 3. Instruct the patient to keep their eyes open 4. Ensure the therapist can observe the patient’s eyes for signs of nystagmus. **Action**: Perform manipulation only if the patient has an appropriate response.

Note

Thomas et al. found that 66% of individuals with cervical artery dissection experienced one of these symptoms prior to diagnosis. Some may not show these symptoms even with a dissection.

Category	Details
Risks of Spinal Manipulation	
By the Numbers	**1. Vertebral Artery Insufficiency**: Estimated risk is approximately 6 in 10 million. **2. Serious Adverse Events**: Risk of any serious adverse event is up to 1 in 10,000 (Thiel et al.). **3. Preventable Events**: Around 50% of adverse events could have been avoided with proper screening (Puentedura et al.).
Mechanical vs. Vascular Pain	**1. Vascular Pain**: Typically associated with a history of minor mechanical trauma. **2. Symptoms**: Often presents as ipsilateral headache and neck pain. **3. Monitoring**: Watch for transient ischemic symptoms (5 D's and 3 N's). Refer to ER for angiogram if vascular involvement is suspected.
Does Age Matter?	**1. Age Precaution**: Individuals over 55 years old are a precaution due to higher prevalence of spondylosis. **2. Degenerative Changes**: Over 90% of people over 70 have some asymptomatic degenerative spine changes. **3. Clinical Reasoning**:

Category	Details
	Use sound clinical judgment and document carefully when considering manipulation for this age group.
Upper Cervical vs. Mid-Cervical Manipulation	**1. Comparative Risk**: Specific comparative risk not clearly established in literature. **2. Stress on Artery**: Extreme cervical rotation causes significant stress on the vertebral artery **3. Upper Cervical Rotation**: Rotation at the atlantoaxial joint places more stress on the vertebral artery than overall cervical rotation. **4. Therapist Precaution**: Consider avoiding end-range upper cervical rotation during manipulation.
Positioning	**1. Extension and Rotation**: Maximum cervical extension and rotation create the highest strain on the vertebral artery. **2. Strain Comparison**: Evidence suggests that the strain during manipulation is similar to that during general range of motion (ROM) testing. **3. Significance of Positioning**: The neck's position may have a greater impact on risk than the actual thrust manipulation.
Can We Ever Be 100% Sure?	**1. Risk Identification**: There is no strong evidence that clinical findings or ultrasonography can reliably identify patients at risk for vertebral artery insufficiency (VBI). **2. Clinical Reasoning**: Always use thorough clinical reasoning and engage in shared decision-making with the patient.

Category	Details
Documentation	**Required Information**: Include the following in the patient's record: • Consent obtained • Technique used • Pre-manipulative hold setup and utilization • Grade of manipulation • Patient's response
Patient Response	**1. Adverse Events**: 20-45% of patients may experience minor to moderate adverse events, with 50% resolving within 48 hours. **2. Common Symptoms**: • Increased neck/shoulder pain • Dizziness • Light-headedness **3. Severe Symptoms**: Severe headache, neck pain, slurred speech, or paralysis/numbness could indicate possible artery dissection. **4. Action**: If severe symptoms occur, monitor the patient closely and ensure they receive immediate emergency care.

Literature Review on Overall Effectiveness

Manipulation vs. Mobilization

Gross et al. (2004)	There is currently insufficient research to establish that either cervical manipulation or mobilization is superior to the other.
Gross et al. (2015)	• Multiple sessions of cervical manipulation and

	mobilization lead to similar improvements in pain, function, quality of life, global perceived effect, and patient satisfaction across all follow-up periods. • For acute and sub-acute neck pain, cervical manipulation might offer more benefit compared to some medications. • For sub-acute and chronic neck pain, cervical mobilization alone may not be significantly more effective than treatments such as ultrasound, TENS, acupuncture, or massage.

Manipulation vs. Exercise

Gross et al	There is strong evidence supporting the use of a combined approach, involving cervical mobilization or manipulation plus exercise, over a wait-and-see strategy.
Hoving et al.	In cases of nonspecific neck pain lasting over two weeks, patients receiving manual therapy alone showed better outcomes compared to those receiving only exercise or those continuing with their usual care provider.

Cervicogenic Headaches

Gross et al.	For chronic cervicogenic headaches, multiple sessions of cervical manipulation may provide greater pain relief compared to massage and TENS in both immediate and short-term follow-ups.
Dunning et al.	Patients receiving upper cervical and upper thoracic manipulations had significantly greater reductions in headache intensity and disability at three-month follow-up compared to those receiving mobilization plus exercise.

Thoracic Manipulation

Gross et al	Thoracic manipulation can effectively reduce pain in patients with acute and sub-acute neck pain.
2017 Neck Pain Clinical Practice Guidelines (CPG)	These guidelines offer B-level evidence supporting thoracic manipulation for various neck conditions. Typically, mid to upper thoracic manipulations are used for cervical pain issues.
Nielsen et al.	There have been no reports of life-threatening or severe adverse events related to thoracic manipulation

McKenzie Approach

While numerous studies have examined the McKenzie method for low back pain, there is limited research on its effectiveness for cervical pain. The majority of existing studies focus on low back pain, leaving a gap in research for cervical conditions.

Example Care Plan/Patient Progression

1 First Visit

1. **Avoid Cervical Manipulation:** It is generally recommended not to perform cervical manipulation during the initial visit.
2. **Focus on Building Therapeutic Alliance (TA):** Recent research highlights the importance of developing a strong therapeutic relationship with the patient.
3. A higher patient-reported level of TA is associated with better outcomes, particularly in back pain management.

Suggested Initial Manual Interventions:

1. Cervical mobilizations
2. Thoracic mobilizations
3. Cervico-thoracic junction mobility
4. Suboccipital release techniques
5. SNAGs (Sustained Natural Apophyseal Glide)
6. Upper cervical flexion-rotation Muscle Energy Techniques (MET)

2 Second Visit

Suggested Manual Interventions:

1. Cervical mobilizations
2. Thoracic manipulation
3. Cervico-thoracic junction manipulation

3 Third Visit

Consider Cervical Manipulation: If indicated, cervical manipulation can be introduced. Waiting a few visits before applying this technique allows time to assess the patient's response to previous manual interventions, build a stronger therapeutic alliance, and enhance patient trust

4 Fourth Visit

1. **Re-assess Patient:** Begin each visit following cervical manipulation by evaluating the patient's response and any changes in their condition.
2. **Adjust Interventions:** Continue with interventions based on the patient's response and progress. Adjust treatment plans as needed.

Appendix A: JOSPT 2017 CPG for Neck Pain: Levels of Evidence

Neck Pain Condition	Cervical Intervention Evidence Level	Thoracic Intervention Evidence Level
Acute Neck Pain with Mobility Deficits	C - Cervical mobilization and manipulation	B - Thoracic manipulation and exercise
Subacute Neck Pain with Mobility Deficits	C - Cervical mobilization and manipulation	C - Thoracic manipulation and exercise
Chronic Neck Pain with Mobility Deficits	B - Cervical manipulation	B - Thoracic manipulation
Chronic Neck Pain with Radiating Pain	B - Cervical manipulation	B - Thoracic mobilization and manipulation
Chronic Neck Pain with Headaches	B - Cervical mobilization and manipulation	B - Cervicothoracic manipulation

Note: Manual techniques should generally be combined with exercises for shoulder girdle and neck stretching, strengthening, and endurance

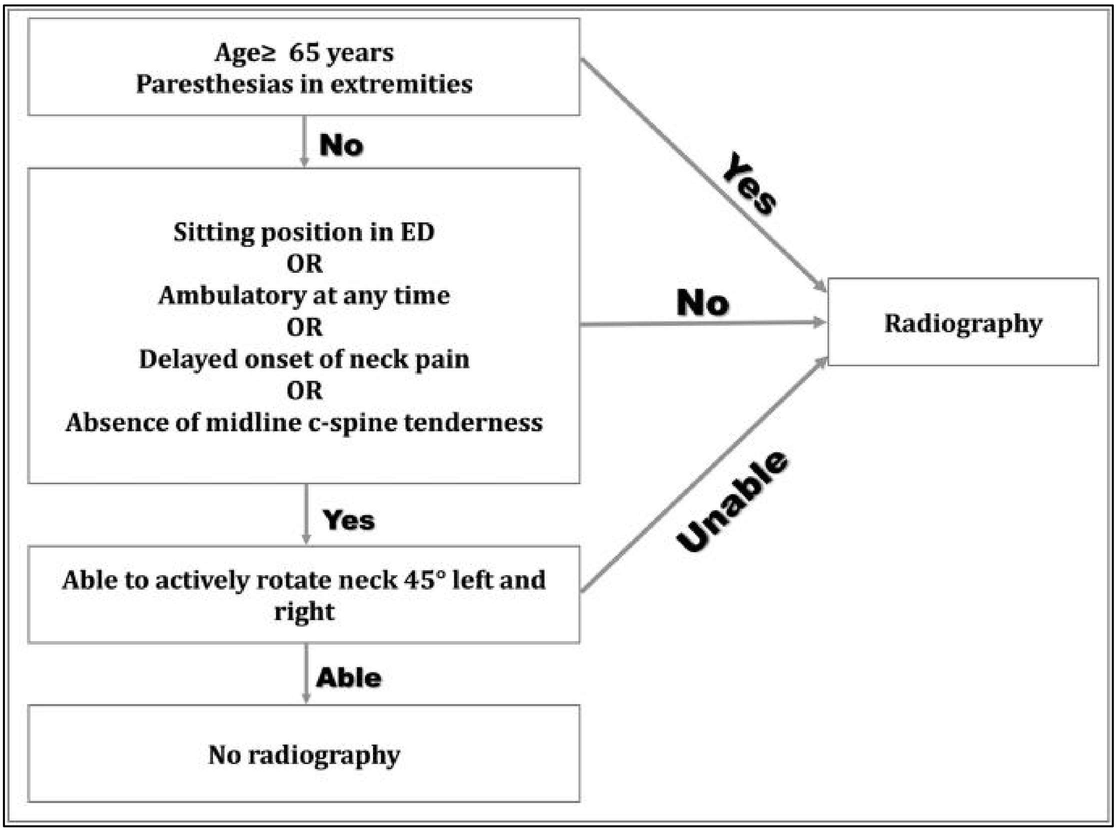
Appendix B: 2017 american heart association blood pressure guideline table

Blood Pressure Categories

American Heart Association.

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)		DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
HYPERTENSIVE CRISIS (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120

Appendix C Canadian C-Spine Rule

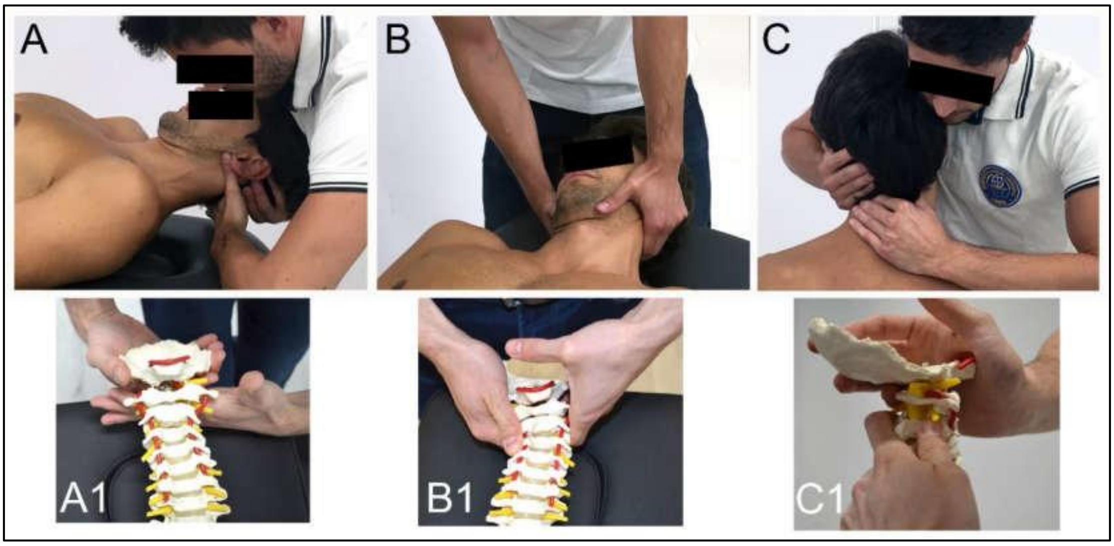


Appendix D: Example Manual Techniques

Note: All techniques should be performed by a licensed Physical Therapist.

1. Upper Cervical Flexion-Rotation Muscle Energy Technique

- **Indications:** Headache and/or upper cervical hypomobility
- **Assessment:** Flex the patient's head into end-range, stabilizing it on your chest. Rotate the head to the right and left to check for restrictions and pain.
- **Treatment:** Flex the head fully, then rotate it toward the restricted side. The patient looks opposite direction with their eyes and holds for 6 seconds. Return to a neutral position and rotate further. Repeat 3 times. Re-assess.



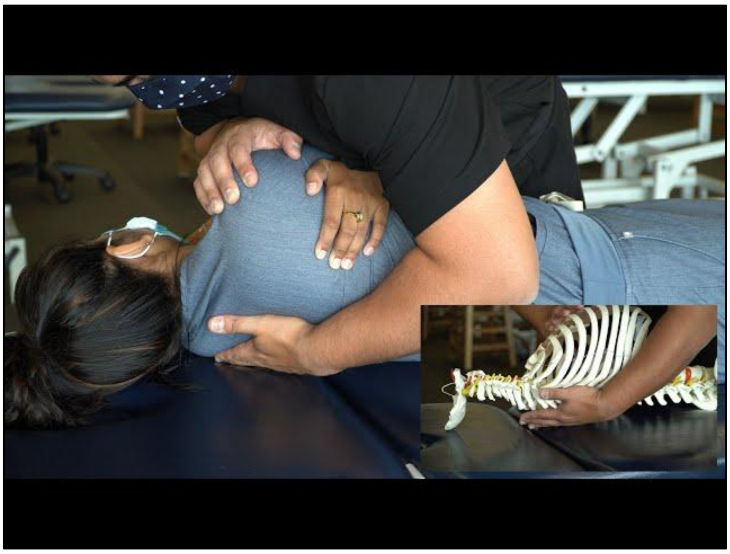
2. Example Thoracic Manipulation Techniques

Seated Upper Thoracic / Cervico-Thoracic Junction HVLAT

- **Patient Position:** Sitting with back to the plinth, hands behind the neck, interlocking fingers.
- **Therapist:** Use a rolled towel between your chest and the patient. Stand with a staggered stance and grasp the patient's wrists. Apply compression by bringing elbows together. Position the patient in slight upper thoracic flexion. Direct HVLA thrust cephalad and posterior.

Supine Mid-Thoracic HVLAT

- **Patient Position:** Supine, arms folded across the chest, with a "V" posture if needed.
- **Therapist:** Roll the patient towards you and place your hand at the targeted level. Roll the patient back to neutral. Position elbows vertically and anterior to the targeted segment. Apply HVLA thrust directly anterior to posterior.



3. Cervico-Thoracic Junction HVLAT in Prone

- **Patient Position:** Prone with ipsilateral arm abducted and resting on the plinth, contralateral arm at the side.
- **Hand Position:** Lower hand contacts T1 with the index finger, upper hand contacts frontal or temporal bone.

Technique: Have the patient look up towards their hand. Lower hand performs a side-shift, bringing T1 towards the therapist. The upper hand provides a side-bending force to cock C7 over T1. Perform HVLA with 70%

Reference

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