

**AN INVESTIGATION OF THE CLINICAL REASONING PATTERNS OF PHYSICAL THERAPISTS  
FOR A CERVICAL SPINE CASE PRESENTATION:**

**History:**

Patient is a 43 year old female, 5<sup>th</sup> grade elementary teacher, with no significant past medical history. Patient states that she has always been fairly healthy. Her current activity level includes running, she averages several 10K races per year. The patient is left hand dominant. Her chief complaint right now consists of intermittent left sided neck pain (best 1/10; worst 5/10) from the skull to the shoulder, as well as left upper extremity symptoms including numbness and tingling.

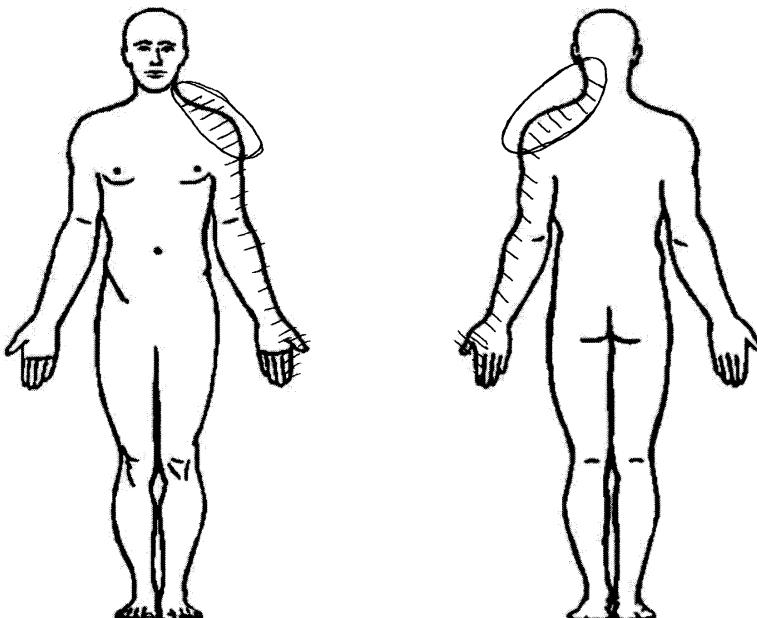
During investigation of her left hand tingling, patient noted most of her symptoms residing in her thumb and index finger. She states that she simply woke up with these symptoms 3 weeks ago. She reported her left hand symptoms are worse while grading papers, performing prolonged computer work, or following long car rides. Patient is currently taking ibuprofen as needed for her neck pain. The patient has not found a way to relieve her numbness or tingling, other than lying down for some time.

Recent radiographic images have revealed degenerative changes of the cervical spine at C4, C5, C6, C7.

**Systems Review:**

- Heart Rate: 67 beats/min
- Respiratory rate: 14 breaths/min
- Blood Pressure: 126/82

**Pain Diagram**



Circle – Pain  
Dash – Tingling/Numbness

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**Observation:**

- Forward head
- Forward shoulder on right, retracted on left
- Lower cervical spine right side bent
- Upper cervical spine left side bent
- BMI: 22 kg/m<sup>2</sup>
- Increased thoracic kyphosis
- Left shoulder girdle elevated, and retracted

**AROM:**

- General cervical (measured using CROM):
  - Repeated flexion and extension activities increased patient's symptoms
  - Side bending left increased patient's symptoms

Range of Motion (degrees)			
Direction	L	R	Reference Value <sup>9</sup>
Flexion	40		58.5
Extension		51*	77.5
Side Bending	23	42	45.3, 45.5
Rotation	53	73	81.8, 80.1

\*Provoking left arm symptoms

- Thoracic:
  - Flexion: WNL
  - Extension: min-mod restriction (flexible kyphosis)
  - SB: bilaterally mild restriction
  - Rotation: bilateral mild restriction

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**Joint Motion Assessment:**

<b>Joint Motion Assessment<sup>10</sup></b>	
0	Ankylosed
1	Severely Hypomobile
2	Mildly Hypomobile
3	Normal
4	Mildly Hypermobile
5	Severely Hypermobile
6	Unstable

<b>OA Joint Motion Assessment</b>			
	Left	Right	
Flexion (dorsal glide)	2	2	
Extension (ventral glide)	3	3	
Left SB/Right Rotation		2	
Right SB/Left Rotation		3	

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<b>Lower Cervical Joint Assessment</b>		
Flexion	C2/3 – C4/5	3
	C5/6	4
	C6/7	4
	C7 through thoracic spine	3
Extension	C2/3 – C4/5	2
	C5/6 – C6/7	4
	C7 through thoracic spine	2
Right Side-Bending/Right Rotation all segments of lower cervical spine		3
Left Side-Bending/Left Rotation all segments of lower cervical spine		2
Shear Intervertebral testing	C5/6	4
	C6/7	4
	Thoracic Spine	3

<b>Myotome Screen</b>		
	<b>Left</b>	<b>Right</b>
C1: Cervical Flexion	4+/5	
C2: Cervical Extension	4/5	
C3: Cervical Side-bending	4/5 - Pain with paresthesia	4/5
C4: Shoulder Elevation	5/5 - Provokes L sided neck pain	5/5
C5: Shoulder Abduction	4+/5 - Provokes L sided neck pain	4+/5
C6: Elbow Flexion	4-/5	5/5
C6: Wrist Extension	4-/5	5/5
C7: Wrist Flexion, Elbow Extension	5/5	5/5
C8: Thumb Extension	4+/5	5/5
T1: Finger Abduction	4/5	5/5

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**Sensory Testing (light touch):**

<b>Sensory Testing (Light Touch)</b>	
<b>C2:</b> Side of head	Normal
<b>C3:</b> Side of neck	Normal
<b>C4:</b> Shoulder	Normal
<b>C5:</b> Radial Styloid	Normal
<b>C6:</b> Thumb	Diminished on L
<b>C7:</b> Digit 3	Normal
<b>C8:</b> Digit 5	Normal
<b>T1:</b> Ulnar Styloid	Normal

**DTR:**

<b>Deep Tendon Reflexes</b>		
	Left	Right
C5: Brachioradialis	2+, normal	2+, normal
C6: Biceps Brachii	1+, slightly hyporeflexive	2+, normal
C7: Triceps Brachii	2+, normal	2+, normal

**Long Track Signs:**

- Hoffman's Sign: normal
- Babinski: normal
- Clonus: normal

<b>Special Tests</b>	
Cervical Compression	C/o concordant pain, cervical spine, and left upper extremity
Cervical Distraction	Concordant symptoms alleviated in cervical spine and left upper extremity
Cervical Spurling's Test	- Positive for concordant symptoms in left upper extremity with left side bending and extension - Left sided neck pain also provoked
Sharp-Purser Test	Negative for instability
Alar Ligament Test	Negative for instability
Thoracic Outlet Tests	Negative
Upper Limb Tension Test (Left side only)	#1: positive for concordant symptoms #2: positive for concordant symptoms #3: negative #4: negative
Tinel's Sign (Median n. at carpal tunnel)	Negative
Phalen's/Reverse Phalen's	Negative
Vertebral Artery	Patient couldn't get into position secondary to concordant symptoms

**Neck Disability Index (NDI):** 8/50 – 16% (mild disability)