

Concord Sport & Spine Newsletter



Thoracic spine involvement in Whiplash associated disorders

The number of people seeking healthcare after a whiplash associated disorder (WAD) has increased significantly over the past 30 years. In North America, up to 6 in 1000 persons will seek care for a WAD². Up to 50% of victims will not fully recover, and 30% will report ongoing moderate to severe symptoms⁴. It is not fully understood why symptoms persist well beyond normal tissue healing times. As well as physical symptoms, there are associated mental health issues such as post-traumatic stress, depression and anxiety.

Most treatment for WAD is naturally directed to the cervical spine. Little attention has been focused on the presence of possible co-existing thoracic spine dysfunction. A Canadian study of over 6000 whiplash victims reported that 66% of respondents suffered mid-thoracic symptoms at the time of injury, and 23% at one year⁵. Interestingly, over 80% of chronic whiplash patients reported thoracic symptoms⁶. A 2016 systematic review stated that “there is unequivocal evidence of thoracic dysfunction in WAD”².

Biomechanics of Injury

1. Sagittal plane motions. Cervical flexion and extension are known to affect motion segments in the upper thoracic spine. It is estimated that the thoracic joints contribute up to 33% of motion to cervical flexion². As well as this, numerous soft tissues, including muscles, fascia, and dura mater, span over multiple cervical and thoracic levels. Rapid uncontrolled flexion of the head and neck (remembering the head weighs around

4.5kg) has the potential to create significant strain injury into the mid-thoracic spine or below.

2. Cervical torsion. It has been reported that the thoracic spine contributes up to 21% of motion to cervical rotation². In a case where a person has the neck is rotated at the time of impact, or where the impact is side-on, it would be expected that some trauma would extend into the upper thoracic spine.
3. Thoracic torsion. For the driver, a three-point seatbelt will restrain right shoulder and mid-trunk motion. The left shoulder and upper trunk is unrestrained. Gross muscle injuries (trapezius and rhomboid avulsions) have been reported after high speed motor vehicle collisions³. These injuries occurred due to the violent whipping action subjected to the unsupported shoulder. It is therefore likely that low to medium speed deceleration will cause some degree of trauma to this region. A UK study of 1000 whiplash victims reported upper to mid-thoracic ‘myofascial-entheseal dysfunction’ in 68% of subjects¹.

Conclusion: In all cases of WAD, examination and treatment should be directed to at least the cervical *and* thoracic spine regions.

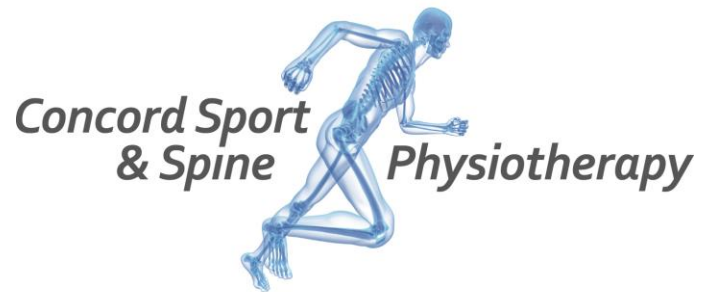
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