

# Spine Management Report

June 2022

## *Permanent Neck Disability Injury Mechanisms Explained*



There is often a medical legal argument as to the “level” of ligament sprain in the neck after a traumatic injury such as a motor vehicle accident. Many clinicians are familiar with the mechanism of injury, Whiplash or Hyper-extension/Hyper-flexion injury. Connective tissue (ligament) links the bony portions of the spine together and is typically the point of weakness in movements that exceed the safety zone for that tissue. The joints in the back of the spine are called facet joints and are connected by multiple ligaments. In a recent paper by **Quarrington et al (2022)**, **the authors wrote, “The bilateral facet joints of the subaxial cervical spine play an important role in load-bearing and kinematics (movement) of the neck. They bear over 64% of axial load**

**in the cervical spine and are responsible for coupled intervertebral motions in axial rotation and lateral bending. The facets also protect the spinal cord by preventing excessive intervertebral axial rotation, lateral bending, and anterior shear motions.”** (pg 540)

These joints play an important role in the stability of the spine and must be considered during any examination of a trauma victim. The authors continue, “The results of the current study are consistent with previous reports that the cervical facet joints are unloaded (corresponding to a decrease in apposition area) during intervertebral flexion, and that they are further unloaded when distraction is superimposed on intervertebral flexion.” (pg 544). What this means is the facet joints are distracted or pulled apart while bending the neck forward and backward. This is how we move our neck, however when the force is too much to handle, we have a ligament injury in the neck. **This is a different type of injury since it is to the connective tissue in the spine and not necessarily the intervertebral disc or nerve. Therefore, these injuries are typically difficult to negotiate and settle since much of the explanation is difficult for carriers and adjuster to understand.**

This paper further supports the injury mechanics. The paper concludes by reporting, “This supports the theory that global head-neck loading that causes intervertebral separation (such as that which might occur during inertial head loading) increases the risk of facet tip fracture, or CFD (cervical facet dislocation) without fracture, while superimposed compression (due to neck muscle activation, for example) is likely associated with more severe fractures of the posterior elements.” (pg 547). Working with providers who understand how to examine the facet joints of the spine is a critical part of the diagnosis and management of cervical injuries. These injuries are often overlooked.



NATIONAL SPINE MANAGEMENT GROUP  
LEADERS IN ACADEMIC SPINE CARE

### REFERENCES:

1: Quarrington, R. D., Thompson-Bagshaw, D. W., & Jones, C. F. (2022). The Effect of Axial Compression and Distraction on Cervical Facet Cartilage Apposition During Shear and Bending Motions. *Annals of biomedical engineering*, 50(5), 540-548.