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## WHIPLASH ASSOCIATED DISORDERS (WAD) AND MECHANISMS FOR POOR OUTCOME

A Review of the Recent Literature by Ron Lewert, D.C.

“There is consistent evidence to support that vehicle damage, occupant position in the vehicle, collision dynamics, findings on imaging, gender, sensori-motor deficit, visits to the ER, lost time from work, and neck range of motion are NOT accurate predictors of injury or long-term outcome following WAD.”

*Physiotherapy management of whiplash associated disorders (WAD). Sterling M. 2014 Journal of Physiotherapy 60: 5-12.*

According to recent research, we are now able to predict long-term outcome for patients following WAD based on initial presenting pain levels and functional status. Physicians are recommended to utilize the **Neck Disability Index (NDI)** and the **Visual Analogue Scale (VAS)** in the initial assessment of pain severity and loss of function. These assessment tools, along with the assessment of patient psychological status at the time of their initial encounter with the physician have been identified as accurate, reliable, and credible, in predicting whether patients will suffer pain-related functional deficits at the 12 month post-accident interval, or beyond.

Psychological status of the injured patient; determining the presence of PTSD (post-traumatic stress disorder), negative pain beliefs regarding recovery, or presence of pain catastrophizing following the collision are important for the clinician to identify as early predictors of poor outcome following WAD. Previously considered factors such as age, gender, awareness of the impending impact, and vehicle damage have been studied over the past several decades as possible contributing factors to poor outcome. However the current evidence-based literature has determined these factors to be **consistently unreliable** in determining injury potential, injury severity, and injury outcome following WAD. Additional factors that show consistent evidence of being **unreliable** indicators of outcome are speed of collision, findings on imaging (X-ray, MRI), presence of sensori-motor deficit, neck range of motion, and compensation-related factors such as attorney representation. Unfortunately, many insurers ignore the literature, continuing to take a hard line on WAD in order to reduce

expenses associated with injury claims; sending patients for early assessments. Such “independent” medical examinations are performed clearly for purposes of termination of treatment. And unfortunately, injury claims are still adjusted according to vehicle damage.

### RECOVERY TRAJECTORIES

A review of the recent literature was performed, revealing three sub-groups of patients involved in rear impact collisions. The factors associated with each sub-group listed represent the most current evidence that is consistent throughout the literature on WAD. Physicians and third parties need to be aware of the following recovery trajectories, as they provide the most credible method to date in the prediction of outcome following whiplash. Outcome for each sub-group is based on severity of initial presenting physical complaints.

**Mild to moderate** - @ 45% of patients will present with mild to moderate symptoms. This group is expected to follow relatively good path to “recovery” within 6 months or less with a plateau in symptoms in 2-3 months. NDI scores 0-28% (<29%), and VAS / self-reported pain levels <5.5/10. These patients do not report PTSD, depression, or negative pain beliefs. These patients still report mild pain-related functional deficits at the 12 month post accident interval.

**Moderate-to-severe** - @ 39% of patients will present with initial moderate to severe symptoms. This group is expected to follow a significantly different path to only partial “recovery” with treatment. The course of treatment is expected to last longer than with the mild to moderate group...with moderate levels of pain and pain-related functional disability still present at the 12 month post-accident interval. NDI scores >29% and VAS (self-reported pain levels) > 5.5. Some reports of post-traumatic stress, depression, or pain-catastrophizing are present in these patients. Clinical signs include neck pain with decreased range of movement, point tenderness, and neurologic findings (decreased or absent DTR's, sensory and / or motor deficit).

**Severe** - @ 16% of patients will present with initial severe

complaints and severe pain-related functional disabilities. This group is expected to follow a much different path to only some “recovery” with treatment. Course of treatment is expected to last longer than the moderate to severe group with moderate levels of pain and moderate or severe functional disability still present at 12 months. NDI (Neck disability index) scores @50-68% and VAS (Visual analogue scale / self-reported pain levels) >5.5. There are common reports of post-traumatic stress, depression, and pain-catastrophizing with this group. Clinical signs may include neck pain with decreased range of movement, point tenderness, neurologic findings such as decreased or absent DTR's (deep tendon reflexes), sensory, and / or motor deficit.

### Central sensitization and cold

**hyperalgesia** - Decreased cold-pain tolerance, known as cold hyperalgesia has been shown to predict disability as well as poor functional and mental health outcomes following whiplash. Low pressure-pain thresholds and sensitivity to light touch, including allodynia reflect augmented nociceptive processing in the central nervous system. This is termed central hypersensitivity or central sensitization. Patients who experience these central nervous system mediated phenomena following WAD are expected to have poor prognosis for full functional recovery.

The majority of recent studies concerning long-term outcome following WAD demonstrate a much less favorable outcome than earlier studies did. This is due to evidence which supports the presence of a tissue-based lesion involving the facet capsules and capsular ligaments. Damage to these structures (including internal disc disruption) leads to modification of tissue properties, nociceptive activation, sustained dysfunction in spinal afferents, neuroplastic changes, phenotypic switching, and central sensitization.

*Additional information and references to the above materials may be obtained from; “Whiplash Associated Disorders And Mechanisms For Poor Outcome: A Review of The Recent Literature”, (Copyright 2014 by Ronald Lewert, D.C. / submitted for publication December 2014)*