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**GLOBAL YEAR AGAINST MUSCULOSKELETAL PAIN**

OCTOBER 2009 – OCTOBER 2010

# Whiplash

## Introduction

Whiplash injury is defined as "an acceleration-deceleration mechanism of energy transferred to the neck usually as a result of a motor vehicle crash." The impact may result in skeletal or soft-tissue injuries, which in turn can lead to a variety of clinical manifestations, including neck pain, neck stiffness, headache, dizziness, paresthesias, and cognitive difficulties such as memory loss. These clinical manifestations are known as whiplash-associated disorder (WAD).

## Epidemiology and Economics

- Whiplash is common after traffic collisions, and it is estimated that more than 300 persons per 100,000 in the population are seen in emergency departments every year.
- Some evidence suggests that the incidence is rising.
- A significant proportion (up to 60%) of those with whiplash develop persistent symptoms ranging from mild to severe pain and disability.
- The most consistent predictor of poor recovery is initial high levels of pain and/or disability.
- Most recovery occurs within the first 3 months, after which time the condition tends to plateau.
- Costs associated with the condition are substantial, for example in Europe the costs are estimated to be €10 billion per annum.
- The role of compensation-related factors on outcome is controversial and remains unresolved.

## Pathophysiology

The pathophysiology of whiplash is not entirely clear. Evidence suggests both structural lesions and effects on sensory and motor function:

- Evidence of lesions to cervical spine structures, particularly the zygapophyseal joints.
- Evidence of sensory disturbances indicative of augmented central pain processing mechanisms.
- Evidence of disturbed muscle function in the form of morphological muscle changes and disturbances in movement and neuromotor control.
- Evidence of disturbed sensorimotor control, including kinesthetic deficits, loss of balance, and loss of eye movement control. These features seem to be associated with symptoms of dizziness.

## Clinical Features

- The onset of symptoms may occur immediately after the accident or may be delayed for up to 12 to 15 hours.
- The predominant symptom is neck pain, but headache, back pain, and shoulder/arm pain can also be present.
- Other common symptoms include dizziness, visual and auditory disturbances, temporomandibular joint pain, photophobia, fatigue, and cognitive difficulties.
- People with whiplash may be psychologically distressed, and such distress seems to be associated with symptom persistence.
- Post-traumatic stress symptoms are emerging as an important psychological feature in some patients.

- Approximately 20–30% of those injured will display a complex presentation comprising:
    - Sensory disturbances such as allodynia and widespread hyperalgesia in the neck region, but also at remote sites such as the lower limbs.
    - Cold hyperalgesia, which seems important as it is associated with poor recovery and with nonresponsiveness to standard physical treatment approaches such as exercise.
    - Spinal cord hyperexcitability via heightened flexor withdrawal responses.
    - Marked loss of neck movement.
    - Motor control deficits, including altered patterns of muscle recruitment in the neck and shoulder girdles.
    - Fatty infiltration of the neck flexor and extensor muscles, identified on MRI.

**Diagnostic Criteria**

- There is no diagnostic test for whiplash.
- The diagnosis is made via patient self-report of symptoms.
- X-rays and other imaging techniques are not useful in the majority of cases to identify a structural lesion. Current clinical guidelines recommend that imaging only be used in suspected cases of fracture or dislocation.
- The Quebec Task Force Classification is the most common and recognized classification system. However, it is nonspecific, particularly regarding the WAD Grade II classification. It fails to take into account recently identified motor, sensory, and psychological features.

**Diagnosis and Treatment**

- The interventions with the strongest evidence of treatment efficacy for acute whiplash are:
    - Reassurance, education, and instructions to maintain activity levels.
    - Exercise, including prescribed functional exercises as well as range-of-motion exercises and muscle re-education.
- The wearing of collars may delay recovery.
- The interventions with the strongest evidence of treatment efficacy for chronic whiplash are:
    - Reassurance, education, and instructions to maintain activity levels.
    - Exercise, including prescribed functional exercises as well as range-of-motion exercises and muscle re-education.
    - Psychological treatments, which may be effective in conjunction with rehabilitation.
    - Radiofrequency neurotomy in selected cases.

**References**


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