



## THE BACK AND FORTH OF WHIPLASH

By Jessica Heath and Neal Goulet

If you type “whiplash” into a search engine, you’ll find a range of stories on the topic.

An American college football running back is undergoing a concussion protocol after suffering a “whiplash effect” in what appeared to be a shoulder injury.

Air Force F-35 pilots are at a serious risk of dying from whiplash if they have to eject during takeoff or landing because of the heavier weight of new helmets.

In England, a teen’s family is suing a theme park, alleging that he is confined to a wheelchair after suffering whiplash on a rollercoaster that left him with a serious spinal cord injury.

Whiplash is a non-specific term describing the violent and fast back-and-forth motion of the neck – like the cracking of a whip.

Whiplash is a traumatic injury to the structures of the cervical spine (the seven uppermost vertebrae). It involves muscles and ligaments and is caused by extremes in range of motion in the absence of severe bony injury such as fracture, dislocation or disc herniation.

Sports accidents, physical abuse and other trauma can cause whiplash, but most often it results from rear-end motor vehicle accidents.



**Whiplash is a traumatic injury to the cervical spine, involving muscles and ligaments and extreme range of motion.**

Each year, U.S. motorists are involved in an estimated 4 million rear collisions. With an annual rate of 70 to 329 per 100,000 people, whiplash is the most common injury after a motor vehicle collision in North America.

Neck sprains or strains are the most serious injury in one-third of insurance claims for injuries in all kinds of crashes, according to the Insurance Institute for Highway Safety, with costs exceeding \$8 billion per year.

### RECOVERY ‘PROLONGED AND INCOMPLETE’

Of course, the physical and emotional costs are incalculable, but recent research suggests that recovery from whiplash is more prolonged and incomplete than previously believed: Approximately half of patients still complain of neck pain one year after their injuries.

In 1995, the Quebec Task Force published a benchmark review that defined whiplash as “an acceleration

deceleration mechanism of energy transfer to the neck.” This transfer has the potential to cause bony or soft-tissue injuries, which can lead to a “variety of clinical manifestations” known as whiplash associated disorders (WAD).

Muscles in the neck, mid-back and shoulder girdle areas can begin to spasm as a result of trying to protect nerves and the spinal cord. Muscle spasms combined with vertebrae getting out of alignment can create nerve impingements, leading to referred pain, or pain that is perceived at a location other than where it originates.

Whiplash symptoms include neck pain and stiffness, arm pain and headaches. Adrenaline in the immediate aftermath of an accident may mask symptoms initially. At the onset of symptoms, it is important to ice the affected area for 20 minutes at a time, every couple of hours.

If you’re of a certain age, you might remember an episode of the television comedy “Sanford & Son,” in which scheming junk dealer Fred Sanford feigns whiplash after being rear-ended in a hit-and-run accident.

He dons a thick neck collar, reflecting common thinking decades ago. However, recent



Scan for WAD  
video tips.

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research suggests that neck collars may do more harm than good because they stop activity of the neck muscles, which can atrophy as a result of prolonged collar use.

The most effective intervention is said to be simple exercises that promote mobilization of the neck during the acute stage of an injury. First, it is important to see a doctor in order to make a prompt and accurate diagnosis – and to rule out fractures or other tissue damage.

If physical therapy is employed soon enough, recovery from whiplash can be limited to a few weeks assuming there is no structural damage. Initial treatment may include soft-tissue massage and modalities such as cold treatments, therapeutic ultrasound, and electrical stimulation for pain control.

Mobilizing soft tissues, such as with hands-on treatment, can eliminate the trigger points and muscle spasms, restoring normal mobility to muscles, tendons and ligaments affected by the whiplash.

Once a whiplash patient is feeling better – affected tissues are given time to heal – physical therapy will progress to gentle exercise. Postural correction may be initiated, proceeding to a strengthening and stabilization program for the neck, mid-back and shoulder.

### PREVENTION

Because whiplash most often occurs during car accidents, it's logical to look there when it comes to prevention. Specifically, head restraints have been shown to prevent whiplash.

“The higher and closer a restraint is, the more likely it

will be to prevent neck injury in a rear collision,” according to the Insurance Institute for Highway Safety.

The top of a head restraint should be even with the top of the head or, if it won't reach that high, should be set as high as it will go. ▀

### REFERENCES

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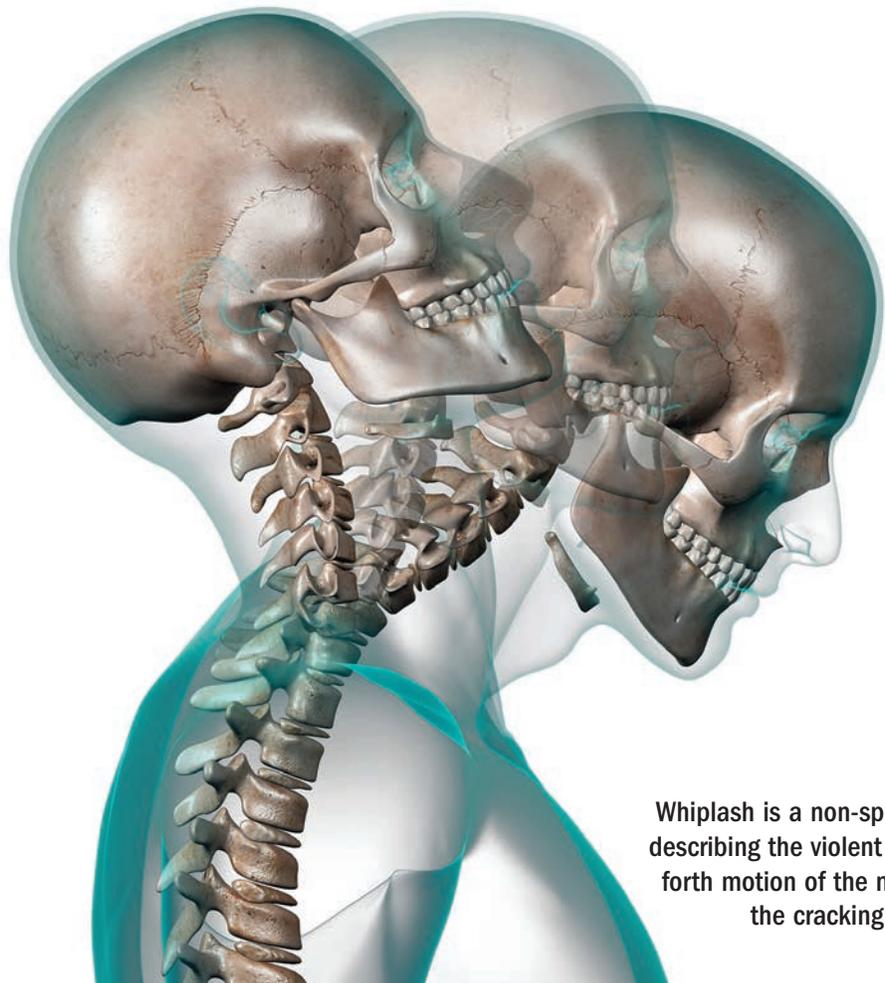
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### FIVE GRADES

# WHIPLASH ASSOCIATED DISORDERS

Whiplash associated disorders, or WADs, can be classified into five grades as identified by the Quebec Task Force:

- **Grade 0:** no neck pain, stiffness, or any physical signs are noticed.
- **Grade 1:** neck complaints of pain, stiffness or tenderness only but no physical signs are noted by the examining physician.
- **Grade 2:** neck complaints and the examining physician finds decreased range of motion and point tenderness in the neck.
- **Grade 3:** neck complaints plus neurological signs such as decreased deep tendon reflexes, weakness and sensory deficits.
- **Grade 4:** neck complaints and fracture or dislocation, or injury to the spinal cord. Requiring further follow up from a physician prior to physical therapy. ▀



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## CASE STUDY

## PHYSICAL THERAPY FOR WHIPLASH

By Katherine Myos

### PATIENT HISTORY

A 42-year-old female was referred to physical therapy for cervical pain, headaches and vertigo. She had a history of concussions and had sustained a whiplash injury in a motor vehicle accident.

Her primary complaint was increased dizziness with head movements and directional changes. She also reported increased headaches; neck pain; intermittent facial numbness; and poor balance with walking, bending forward, lifting and carrying her daughter, and ascending or descending stairs.

Imaging – open-mouth X-rays and MRI – had proved negative for fracture or brain injury, respectively.

### ASSESSMENT

The patient presented with poor posture. Her cervical range of motion was limited, painful and caused dizziness in all directions, especially with rotation to the right.

She had significant weakness in her cervical spine muscles (reflected in the fact that she was unable to hold her head off the treatment table) and poor scapular strength.

Because of her dizziness, a vestibular examination was performed. She tested positive for reduced oculomotor function (eye muscle coordination) and poor balance, especially on uneven surfaces.



**The 42-year-old female patient's musculoskeletal treatment included cervical and thoracic manual techniques.**

oculomotor (eye reflexes) training focused on improving her balance.

Home modifications were addressed, namely reducing television, phone and computer use and initiating a walking program with her husband when symptom free.

As she progressed, she integrated functional tasks including lifting and focusing in a stimulating environment.

Cardiovascular training progressed with a return to running and biking while monitoring any return of headaches, dizziness or excess fatigue.

### SUMMARY

At discharge, the patient had not experienced headaches or dizziness for more than two weeks. She was instructed to continue her strengthening, vestibular exercises, and postural awareness exercises at home. ▀

**THE PATIENT PRESENTED WITH POOR POSTURE. HER CERVICAL RANGE OF MOTION WAS LIMITED, PAINFUL AND CAUSED DIZZINESS IN ALL DIRECTIONS, ESPECIALLY WITH ROTATION TO THE RIGHT.**

### TREATMENT

The treatment for cervical dysfunction included cervical and thoracic manual techniques,

postural education, and cervical and scapular strengthening; the approach for vestibular dysfunction consisted of

## RESEARCH ABSTRACT

## PT APPROACHES FOR WHIPLASH ASSOCIATED DISORDERS

By Misty Seidenburg

### INTRODUCTION

Whiplash is the most common injury related to motor vehicle accidents. Symptoms can begin anywhere from a few hours to one day after an incident.

Whiplash associated disorders (WAD) can be classified into five grades (see page 2). Grades 3 and 4 are the most serious and require further follow-up with a physician prior to a patient starting a physical therapy program.

Grade 1 symptoms include neck pain, stiffness or tenderness; Grade 2 symptoms include neck pain with decreased range of motion and point tenderness. For these types of WAD, conservative care often is prescribed, with recommendations for “act as usual” (AAU) care (no active treatment) or physical therapy.

WAD can be pricey: 84.5 percent of the costs are incurred during the acute episode and can result in an absence from work of more than two months.

The aim of this study was to determine medical and economic benefit for patients among two physical therapy approaches and the recommendation to act as usual.

### METHODS

Seventy patients classified as Grade 2 randomly were



**The findings demonstrate that outcomes, including cost effectiveness, are better with an active approach to physical therapy.**

assigned to one of two groups. The first group was treated with active physical therapy (APT) and the second with passive physical therapy (PPT).

All patients were given an initial course of nonsteroidal anti-inflammatory drugs (NSAIDs) and provided with a soft collar for one week. They then began physical therapy three times per week for seven weeks.

The APT group received soft-tissue treatment, trigger point treatment, joint mobilization, posture training, and electrotherapy followed by coordination training, trunk and extremity stabilization, and cervical resistance exercises. The

PPT group treatment included the application of moist heat, massage and electrotherapy.

The two groups' results were compared with those of a third group from an earlier study that was assigned to AAU care. WAD was explained to the patients, to whom it was recommended that they resume normal activities without modifications. Pain, range of motion, periods of disability, and associated costs were assessed.

### RESULTS

The APT group demonstrated significantly greater improvement in pain levels compared with the PPT and AAU groups.

- In both groups that received physical therapy, the period of disability was less than the AAU group: 14 days vs. 49 days.
- Average costs in the physical therapy groups were one-third of those for the AAU group.
- Range of motion improved across the groups with no significant differences among them.

### DISCUSSION

The effect of physical therapy for treating WAD has not been widely studied and has had variable outcomes. The findings of this study demonstrate that outcomes are better with an active approach to physical therapy that includes manual treatment, range of motion, postural training, and stabilization exercises.

For patients, pain reduction is the most common goal, in which case active physical therapy should be considered. For Grade 2 patients, APT should be recommended as the best option for achieving the best outcomes as far as therapy and cost. ▀

### REFERENCE

Dehner, C., et al. “Grade II whiplash injuries to the neck: What is the benefit for patients treated by different physical therapy modalities?” *Patient Safety in Surgery*. 2009; 3(2).