

# SpineFAQs

## Whiplash

*Whiplash* is defined as a sudden *extension* of the cervical spine (backward movement of the neck) and *flexion* (forward movement of the neck). This type of trauma is also referred to as a *cervical acceleration-deceleration* (CAD) injury. Rear-end or side-impact motor vehicle collisions are the number one cause of whiplash with injury to the muscles, ligaments, tendons, joints, and discs of the cervical spine.

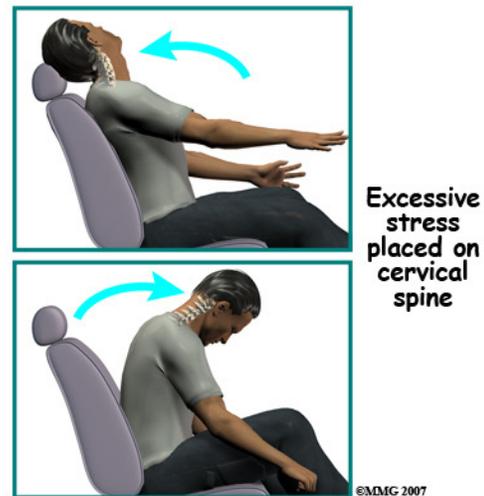
### What causes this condition?

When the head and neck are suddenly and forcefully whipped forward and back, mechanical forces place excessive stress on the cervical spine. Traumatic disc rupture and soft tissue damage can occur. The cartilage between the disc and the vertebral bone is often cracked. This is known as a *rim lesion*.

Damage to the disc can put pressure on the nerves as they exit the spine. The pressure or irritation can be felt as numbness on the skin, weakness in the muscles, or pain along the path of the nerve. Most people think of these symptoms as indications of a pinched nerve. Health care providers call this condition *cervical radiculopathy*.

Soft tissue around the facet joint can be injured. Many of the pain-sensing nerves of the spine are in the facet joints. The normally smooth surfaces on which these joints glide can become rough, irritated, and inflamed. Studies show that neck pain often comes from the damaged facet joints.

Low back pain is a common feature after a whiplash injury. Studies show that there is significant electrical activity in the muscles of the lumbar spine when the neck is extended. This effect increases when there is neck pain, possibly as a way to help stabilize the spine when neck pain causes weakness.



More than anyplace else in the body, the muscles of the neck sense sudden changes in tension and respond quickly. Tiny spindles in the muscles signal the need for more muscle tension to hold against the sudden shift in position.

The result is often muscle spasm as a self-protective measure. The increased muscle tone prevents motion of the inflamed joint. You may experience neck stiffness as a result.

### **What are the risk factors?**

Each year, about three million people experience whiplash injuries to their neck and back. Of these three million people, only about one-half, will fully recover. About 600,000 of those individuals will have long-term symptoms, and 150,000 will actually become disabled as a result of the injury.

There are many factors that come into play when a person is injured in a rear-end motor vehicle accident. Any one or more of the following factors can affect recovery:

- Head turned one way or the other at the time of the impact
- Getting hit from behind (rear-impact collision)
- Previous neck pain or headaches
- Previous similar injury
- Being unaware of the impending impact
- Poor posture at the time of impact (head, or neck bent forward)
- Poor position of the headrest or no headrest
- Crash speed *under* 10 mph
- Being in the front seat as opposed to sitting in the back seat
- Collision with a vehicle larger than yours
- Being of slight build
- Wearing a seatbelt (a seat belt should always be worn, but at lower speeds, a lap and shoulder type seat belt will increase the chances of injury)

### **What are some of the symptoms of whiplash?**

90% of patients involved in whiplash type accidents complain of *neck pain*. This is by far the most common symptom. The pain often spreads into the upper back, between the shoulder blades, or down the arm. Neck pain that goes down the arm is called *radiculopathy*.

*Low back pain* (LBP) can occur as a result of a whiplash injury. The Insurance Research Council reports that LBP occurs in 39 per cent of whiplash patients. Some studies found LBP to be present in 57 per cent of rear-impact collisions in which injuries were reported and 71 per cent of side-impact collisions.

*Jaw pain* as a result of *temporomandibular joint* (TMJ) injury can also cause painful headaches. The TMJ is formed by the bone of the *mandible* (lower jaw) connecting to the *temporal bone* at the side of the skull. The TMJ is a hinge joint that allows the jaw to open and close and to move forward, back, and sideways. Pain in this joint is called *temporomandibular joint disorder* (TMD).

*Dizziness* is quite common with a sense of lost balance being reported. It is caused by an injury to the joints of the neck called *facet* or *zygapophyseal* joints. When dizziness is reported, it should be distinguished from *vertigo* (also known as *benign paroxysmal positional vertigo* (BPPV), which results from an injury to the inner ear.

Other symptoms often reported include, but are not limited to: shoulder pain; numbness or tingling in the arms, hands, legs or feet; facial pain, fatigue, confusion, poor concentration, irritability, difficulty sleeping, forgetfulness, visual problems, and mood disorders.

It is not uncommon to have a delay in your symptoms. It is actually more common to have a 24 to 72 hour delay as opposed to immediate symptoms or pain. This is most likely due to the fact that it takes the body 24 to 72 hours to develop inflammation. Disc injuries may take even longer to manifest themselves. It is not uncommon for a disc injury to remain pain free and unnoticed for weeks to months.

Simply because there is little or no damage to your car does not mean that you were not injured. In fact, more than half of all whiplash injuries occur where there was little or no damage to one or both of the vehicles involved. When we see visible damage to a car, it means that the car has absorbed much of that force and less force is transmitted to the occupant. On the other hand, if there is little or no damage to the car, the force is not absorbed but transferred to the driver or passengers, potentially resulting in greater injury.

## **How do you diagnose the problem?**

The diagnosis of neck problems begins with a thorough history of your condition and the involved car accident. You might be asked to fill out a questionnaire describing your neck problems. Then I will ask you questions to find out when you first started having problems, what makes your symptoms better or worse, and how the symptoms affect your daily activity. Your answers will help guide the physical examination.

I will then physically examine the muscles and joints of your neck. It is important that your doctor see how your neck is aligned, how it moves, and exactly where it hurts. I will do some simple tests to check the function of the nerves. These tests measure your arm and hand strength, check your reflexes, and help determine whether you have numbness in your arms, hands, or fingers. The information from your medical history and physical examination will help me decide which tests to order. The tests give different types of information.

## **Radiological Imaging**

Radiological imaging tests help me see the anatomy of your spine. There are many kinds of imaging tests including:

**X-rays** – X-Rays show problems with bones, such as infection, bone tumors, or fractures. X-rays of the spine also can give me information about how much degeneration has occurred in the spine, such as the amount of space in the neural foramina and between the discs. X-rays are usually the first test ordered before any of the more specialized tests. Special x-rays called *flexion/extension* x-rays may help to determine if there is instability between vertebrae. These x-rays are taken from the side as you bend as far forward and then as far backward as you can. Comparing the two x-rays allows me to see how much motion occurs between each spinal segment.

**Magnetic resonance imaging (MRI)** - If more information is needed, I may order an *MRI*. The MRI machine uses magnetic waves rather than x-rays to create pictures of the cervical spine in slices. MRIs show the cervical spine vertebrae, as well as the soft tissue structures, such as the discs, joints, and nerves. MRI scans are painless and don't

require needles or dye. MRI scan has become the most common test to look at the cervical spine after x-rays have been taken.

**Computed Tomography (CT)** - *CT scan* is a special type of x-ray that lets doctors see slices of bone tissue. The machine uses a computer and x-rays to create these slices. It is used primarily when problems are suspected in the bones.

## **Grading the Severity of Injury**

The physical exam combined with the imaging studies help determine the severity or *grade* of the injury. There is more than one way to assign a grade to a patient's whiplash. Here are two examples of the more commonly used models used to classify or grade whiplash injuries:

### **Croft Guidelines**

Grade I: Minimal – No limitation of motion, no ligamentous injury, no neurological findings

Grade II: Slight – Slight limitation of motion, no ligamentous injury, no neurologic findings

Grade III: Moderate – Limitation of motion, ligamentous instability, neurologic symptoms present

Grade IV: Moderate-to-Severe – Limitation of motion, some ligamentous injury, neurological symptoms, fracture or disc derangement

### **Quebec Whiplash Classification**

Grade 0: No complaint or physical sign

Grade I: Neck pain, stiffness or tenderness, no physical signs

Grade II: Neck pain and musculoskeletal signs

Grade III: Neck pain and neurological signs

Grade IV: Neck pain and fracture or dislocation

## What treatment options are available?

Whenever possible, I prefer to use treatments other than surgery. The first goal of these nonsurgical treatments is to ease your pain and other symptoms. We will work with you to improve your neck movement and strength. They will also encourage healthy body alignment and posture. These steps are designed to enable you to get back to your normal activities. Conservative care may include:

**Immobilization** - At first, I may prescribe immobilization of the neck. Keeping the neck still for a short time can calm inflammation and pain. This might include one to two days of bed rest and the use of a soft cervical (neck) collar. The collar is a padded ring that wraps around the neck and is held in place by a Velcro strap. A soft cervical collar may be used for the first 24 to 48 hours to help provide support and reduce pain. There is no need for a hard or rigid cervical collar unless the neck is fractured. Soft collars should not be worn after 48 hours without a physician's approval. Studies show that prolonged immobilization can delay healing and promote disability. Wearing it longer tends to weaken the neck muscles and reduces the facet joints' sense of position called *proprioception*.

A cervical support pillow may offer some additional support while sleeping and helps to keep the neck in a more neutral position. Cervical pillows can be used any time by anyone for improved alignment while sleeping.

**Medication** – I generally prescribe certain types of medication if the nerves are irritated or compressed and you have neck pain that travels down your arm (radiculopathy). Severe symptoms may be treated with narcotic drugs, such as hydrocodone. These drugs, however, should only be used for the first few days or weeks after problems with radiculopathy start because they are addictive when used too much or improperly. Muscle relaxants may be prescribed to calm neck muscles that are in spasm. You may be prescribed anti-inflammatory medications such as ibuprofen.

**Facet Joint Injection** - Pain resulting from irritation of the facet joints may be alleviated with injection of an anesthetic agent similar to Novacaine such as Bupivacaine. This numbing agent both confirms

the source of pain as coming from the joint and helps reduce or eliminate the pain.

**Physical Therapy** – I often have my patients work with a physical therapist. If you require outpatient physical therapy, you will probably only need to attend therapy sessions for two to four weeks. Your rate of recovery helps determine the length of time in physical therapy. Patients with delayed recovery may need longer time in rehab. At first, treatment is focused on easing pain and reducing inflammation. Ice and electrical stimulation treatments are commonly used to help with these goals. Electrical stimulation treatments can help calm muscle spasm and pain. Traction is a way to gently stretch the joints and muscles of the neck. It can be done using a machine with a special head halter, or the therapist can apply the traction pull by hand. Your therapist may also use massage and other hands-on treatments to ease muscle spasm and pain.

Active treatments are added within the comfortable range of motion. The therapist will teach you specific exercises to help tone and control the muscles that stabilize the neck and upper back. Your therapist will work with you on how to move and do activities. This form of treatment, called *body mechanics*, is used to help you develop new movement habits. This training helps you keep your neck in safe positions as you go about your work and daily activities. You'll learn how to keep your neck safe while you lift and carry items and as you begin to do other heavier activities. As your condition improves, your therapist will begin tailoring your program to help prepare you to go back to work. Some patients are not able to go back to a previous job that requires heavy and strenuous tasks. Your therapist may suggest changes in job tasks that enable you to go back to your previous job. Your therapist can also provide ideas for alternate forms of work. You'll learn to do your tasks in ways that keep your neck safe and free of extra strain.

**Chiropractic care** - Chiropractic care also offers another opportunity for relief of pain from a whiplash injury. Chiropractors adjust misalignments of the facet joints and vertebrae to restore the nerve signals and improve spinal health, which can impact overall physical health. Many chiropractors make these adjustments using a thrust technique called *manipulation*. Chiropractors also take into account

how nutrition, emotion, and environment affect our health. The chiropractor will assess your posture during daily activities, work, and sleep and offer you suggestions for ways to improve your day-to-day spinal alignment. You may be given some additional advice about the use of heat, cold, and exercise to help maintain the results of your chiropractic treatment.

**Surgery** - Most people with lingering effects from whiplash or cervical radiculopathy from whiplash get better without surgery. In rare cases, surgery may be suggested. Radiculopathy due to a disc herniation, or foraminal stenosis can be effectively treated with surgery. It is rare that neck pain alone can be treated with surgery, unless it is due to instability of the spine.

### **What are the results of treatment?**

The vast majority of patients will improve...given time. It can take many months to resolve your symptoms. Unfortunately many people may have some mild residual problems such as stiffness, discomfort, restricted motion, and headaches up to many years after injury.