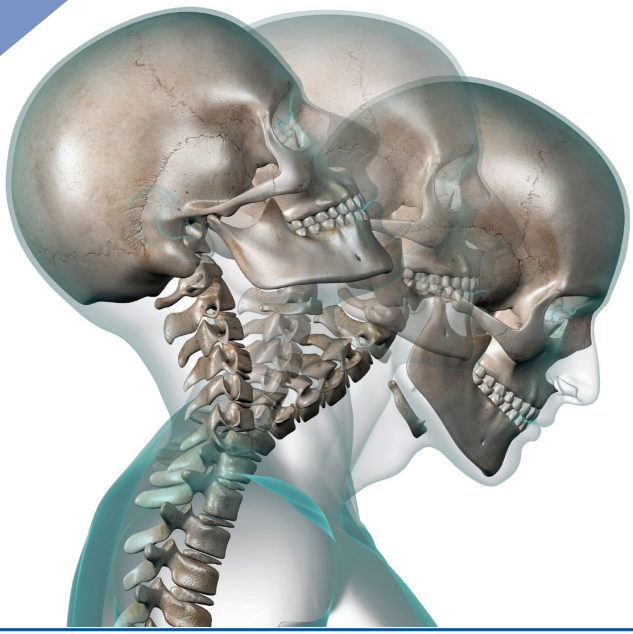
Whiplash and Whiplash-Associated Disorders



North American Spine Society
Public Education Series

What Is Whiplash?

The term “whiplash” might be confusing because it describes both a mechanism of injury and the symptoms caused by that injury. The most common symptom of whiplash is neck pain. The most common cause is a motor vehicle accident (MVA). In addition to neck pain, there may be pain in one or both arms, between the shoulder blades, the face and even the low back. Other symptoms - usually called “whiplash associated disorders” (WAD) - include heaviness or tingling in the arms, dizziness, ringing in the ears, vision changes, fatigue, poor concentration or memory and difficulty sleeping. If pain does not get better after several months, patients often get depressed.

What Causes Whiplash?

The most common cause of whiplash and WAD is a motor vehicle accident (MVA) in which one car (the struck vehicle) is hit from behind by another (the bullet vehicle). However, whiplash can also occur after side or front impact collisions. The energy of the impact passes through the bullet vehicle to the struck vehicle and then to the passengers. The amount of energy is determined by the weight of each vehicle and the speed at which they are traveling. If you are struck by a larger, faster vehicle, more energy will be transferred to you and your passengers and you are at greater risk for whiplash injury.

Outcome of Neck Pain due to Whiplash

Most people who are in an MVA do not get neck pain or WAD. More important, most people who do get neck pain after an MVA will get better after a few weeks up to a few months. Only about one out of three patients does not totally recover - and even then, pain is usually mild, often comes and goes, and rarely interferes with daily activities or work. In general, after six months most people who are going to get better on their own will be better (although some patients do take longer to recover.) Just 10% of people who get neck pain after an MVA wind up with constant severe pain, but those are the patients who need the most medical care. Patients with pre-existing neck pain and those with abnormal X-rays at the time of the accident are at greater risk for chronic neck pain than others.

Anatomy of the Neck

The spine is a long chain of bones, discs, muscles and ligaments that extends from the base of the skull to the tip of the tailbone. The cervical spine (neck region) supports the head, protects the nerves and spinal cord, and allows for smooth function of the neck during activity. The major structural support is from the vertebrae (bone). Between two adjacent vertebrae is a disc. In the back of each vertebra are two facet joints, one on each side. The facet joints are designed to allow smooth motion for bending forward. backward and rotating, but also limit excess motion. Muscles and ligaments surround and support the spinal column. All of these structures have nerve supplies, and injury to any one can cause pain

What Causes Chronic Neck Pain?

It is usually not possible to know the exact cause of neck pain in the days or weeks after a car accident. We know the muscles and ligaments get strained and are probably inflamed, but they usually heal within six to ten weeks. Pain that lasts longer is usually due to deeper problems such as injury to the disc or facet joint, or both.

- **Facet Joint Pain** is the most common cause of chronic neck pain after a car accident. It may occur alone or along with disc pain. Facet joint pain is usually located to the right or left of the center back of the neck. The area might be tender to the touch, and facet pain may be mistaken for muscle pain. We cannot tell if a facet joint hurts by how it looks on an X-ray or MRI scan. The only way to tell if the joint is a cause of pain is to perform an injection called "medial branch block (MBB)," which is discussed below.

- **Disc Injury** can also cause chronic neck pain. The disc allows motion of the neck, but at the same time keeps the neck from moving too much. The outer wall of the disc (called the anulus) can be torn by a whiplash injury. This usually heals, but in some people, the disc does not heal. In that case, it might get weaker and hurts when stressed during normal activities. The pain comes from the nerve endings in the anulus. The disc is the major cause of chronic neck pain in about 25% of patients, and there can be both disc pain and facet pain in some people. Less often, a disc can herniate and push on a nerve. This usually causes more arm pain than neck pain.

Chronic Neck Pain Causes
Continued...

- **Muscle Strain** of the neck and upper back can cause acute pain. However, there is no evidence that neck muscles are a primary cause of chronic neck pain, although muscles can hurt if they are working too hard to protect injured discs, joints, or the nerves of the neck or there is something else wrong that sustains the muscle pain, such as poor posture and work habits.
- Spinal nerves and the spinal cord can be compressed by a **Herniated Disc** or **Bone Spur.** This usually causes arm pain, but there can also be neck pain. *(If you are diagnosed with a herniated disc, see the NASS Patient Education Brochure on Cervical Herniated Disc for more information.)*

What are the Symptoms?

What are the symptoms of whiplash and WAD?

- Headache due to neck problems is called cervicogenic or neck-related headache. It may be due to injury to an upper cervical disc, facet joint or higher joints called the atlanto-occipital or atlanto-axial joints. Cervicogenic headache can also make migraines worse.
- Arm pain and heaviness may be due to nerve compression from a herniated disc, which is easy for your health care professional to diagnose. More commonly, arm pain is "referred" from other parts of the neck. "Referred pain" is pain that is felt at a place away from the injured areas, but not due to pressure on a nerve.
- Pain between the shoulder blades is usually a type of referred pain.
- Low back pain is occasionally seen and is quite common after whiplash and may be due to injury to the discs, facet joints of the low back or sacroiliac joints.
- Difficulties with concentration or memory can be due to pain itself, medications you are taking for the pain, depression or mild brain injury. You might also experience irritability and depression.
- Sleep disturbance can be caused by pain or depression.
- Other symptoms might include blurry vision, ringing in the ears, tingling in the face and fatigue.

How Is Whiplash Diagnosed?

Your health care professional ask you about your symptoms and how the injury occurred, and then perform a physical examination. This will allow the health care professional to know if you need any tests immediately or if they can wait, and also how to best treat your problem. In patients who do not get better after about 12 weeks, more detailed evaluation might be needed and some of the tests are described below. Not all patients need all tests.

- **X-rays** are used right after injury if the health care professional suspects there may be a fracture or that the spine is not stable. X-rays also show disc height and bone spurs. Otherwise they are often used in patients who do not get significantly better by about 12 weeks. If an MRI is performed, X-ray examination is usually also done to look at the bone anatomy.
- **MRI scan** is necessary if the health care professional suspects a disc herniation, disc injury or compression of a nerve or the spinal cord. *(See the NASS Patient Education brochure on Magnetic Resonance Imaging for more information if this test is prescribed for you.)*

- **Medial branch block (MBB)** is an injection done to determine whether a facet joint is contributing to neck pain.
- **Discography** is an injection into the disc itself to determine if a disc may be contributing to the pain. Discography is only used for patients with severe pain that has not improved with good treatment, and for whom surgery is being considered. *(See the NASS Patient Education brochure on Discography for more information if this test is prescribed for you.)*
- **Computed tomography (CT scan),** usually combined with myelogram (dye or contrast injected into the spinal canal) can also be used to help diagnose neck pain that does not respond to treatment.
- **Electromyography and nerve conduction velocity (EMG/NCV)** might be used if there is suspicion that a nerve is being trapped (such as in carpal tunnel syndrome) or there is nerve damage. *(See the NASS Patient Education brochure on EMG for more information if this test is prescribed for you.)*

Treatment of Whiplash

The treatment of whiplash in the first few weeks and months usually involves strength training and body mechanics instruction. Patients who do not get better after about 12 weeks require specialized treatment, often from a spine specialist, based on the cause of the pain.

- Strength training is necessary to develop sufficient muscle strength to be able to hold the head and neck in positions of good posture at rest and during activity. Strengthening the muscles will also improve their range of motion.
- Body mechanics describes the interrelationship between the head, neck, upper body and low back during movement and at rest. Training in proper posture decreases the stress on muscles, discs and vertebrae, giving damaged tissue the chance to heal. Poor posture and body mechanics unbalances the spine and creates high stress on the neck, which may impede healing.
- Medications are helpful for symptom control. They never solve the problem and should be used as just one part of a total treatment program. There is no best medicine for neck pain. The choice of medication depends on the type, severity and duration of the pain as well as the general medical condition of the patient. Types of medications that are most often prescribed for acute neck pain include antiinflammatory drugs and opioid (narcotic) pain relievers. Additionally, your health care professional may prescribe the use of muscle relaxants. For chronic and severe neck pain, the opioid analgesics and antidepressants are generally most helpful.
- Spinal Injections can be helpful in carefully selected patients. Again, injections do not cure the problem and should be only one part of a comprehensive treatment program.

Epidural injections into the spinal canal can provide short-term relief in cases of nerve compression with arm pain, but are rarely effective for pure disc pain without radiating symptoms. Facet (zygopophyseal) injections may help temporarily with neck pain and are usually tried before radiofrequency neurotomy. Radiofrequency neurotomy (RFN) is a procedure that heats the nerves to stop them from conducting pain signals but is only useful for facet joint pain. It can help for about nine to 18 months and then can be repeated if needed and should only be considered in chronic situations with significant pain.

- Spinal manipulative therapy (SMT) is usually provided by chiropractors, osteopaths or specially trained physical therapists. SMT can provide relief from symptoms for many patients, and is generally safe. SMT should be combined with strength training and body mechanics instruction.
- Surgery for chronic neck pain is hardly ever necessary. However, surgery can be helpful when there is severe pain arising from one or two discs and the patient is very disabled, psychologically healthy and has not gotten better with nonoperative care. Surgery is done more often when there is pressure on a nerve or the spinal cord.

If You Have Whiplash ...

- A spine care specialist can help relieve the pain of whiplash and regain range of motion. Follow your health care professional's instructions carefully.
- Remain active and do the exercises that you are taught to improve your posture and reduce the strain on your neck.
- Remember that, with proper care and patience, you are likely to recover from whiplash.

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DISCLAIMER

The information in this pamphlet is selective and does not cover all possible causes, actions, precautions or possible outcomes of whiplash. If you have any questions contact your health care provider for more information.This brochure is for general information and understanding only and is not intended to represent official policy of the North American Spine Society. Please consult your health care provider for specific information about your condition.

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