

## **FUNCTIONAL DISORDERS: Neck Pain and Whiplash**

### **NECK PAIN**

#### **What are the different causes of neck pain?**

Many cases of neck pain are either caused completely or in part by chronic muscle tension. Some common causes of muscle tension in the neck are:

- Instinctively balancing out the neck and head to make up for postural misalignment in the core of the body
- Stress
- Daily activities, such as: working at a computer, looking down at or talking on a phone, driving, tasks at a physical job, playing a musical instrument, holding a baby, sleeping position
- Sports or exercise that use the upper body and involve throwing, twisting, jumping, impact, or lifting weight (such as weightlifting, baseball, football, gymnastics, etc.)
- Reaction to an injury to the neck or upper body (see next section on Whiplash)

Neck pain can also be caused by cervical disc compression and degeneration, and nerve compression. Except in cases of acute injury, disc and nerve issues are most often originally caused by muscle tension creating compression and misalignment of the spine. For a refresher on spinal issues, refer to CEI Level 2 , Section 6.

#### **How to work with neck pain**

There are three things you should do when working with a student who has neck pain caused by muscular tension (see below for details on each):

1. Assess whether their neck pain and tension may be the result of instinctively balancing out their neck and head to compensate for an imbalance in the core of their body.
2. Work very gently with the muscles of the neck and shoulders, and focus on gradual improvement.
3. Educate your student on how they can improve their body use during, or reduce the amount of time spent doing, repetitive activities that might be causing or contributing to their neck pain and tension.

## **1. Assess whether their neck pain and tension may be the result of instinctively balancing out their neck and head to compensate for an imbalance in the core of their body.**

If someone has hyperkyphotic posture, the suboccipital muscles (at the base of the skull) and the extensor muscles of the neck (that pull the head backward) have to work hard to tip the head upright so that the person can stay balanced and look straight ahead. These overworked muscles can easily become sore and painful. Over time, the compression of the cervical spine can lead to cervical disc issues and nerve impingement. People in this withdrawal response posture also tend to raise their shoulders upward, leading to chronic tension in their upper trapezius.

If someone has a version of side-bending posture (scoliosis, leg length discrepancy, uneven shoulders) they may have to tip or turn their head and neck to one side in order to balance themselves out. They may have tightness and pain on one or both sides of their neck and shoulders.

Hyperlordotic posture is less likely to be the cause of neck pain. However, if someone's lower back is tight and arched, they might balance themselves out by bringing their head and neck forward (kyphosis-lordosis posture), creating a similar situation as in hyperkyphotic posture. They might also develop this posture if they experience both the withdrawal and action response regularly.

In any of these situations, you must teach your student exercises that address the imbalances in their posture and muscular tension that are occurring in the core of their body. Their neck tension and pain probably won't resolve if the core of their body is not brought into balance.

## **2. Work very gently with the muscles of the neck and shoulders, and focus on gradual improvement.**

The muscles of the neck and shoulders are constantly working to keep the head balanced on top of the spine. Since these muscles never get a break, they are prone to chronic tension and spasm, and are often slow to release from spasm.

I advise telling your students with neck pain to work extremely slowly and gently with their neck muscles, be patient, and let the process of releasing these muscles be a gradual process. The simple upper trapezius release at the end of the Ultimate Pandiculation video is a great way to start working with the neck and shoulder muscles, and to get your student comfortable with what a pandiculation is.

Remind your student not to stretch their neck muscles, massage them deeply, or “mess with” them in general. People will often do these things to temporarily relieve their tension, but these habits only serve to activate the stretch reflex and make the muscles tighter.

People with neck pain often have trouble lifting their head off the floor in exercises that involve curling up. These exercises can typically be modified by simply leaving the head on the floor. For example:

**Back Lift:** Only do this if your student can lie on their stomach comfortably. They can do whatever they need to with their head and neck to be comfortable: keep their head and neck straight, with forehead on the floor; or keep their head turned to whichever side is comfortable. Skip the head lifting parts of the movement.

**Arch & Curl:** Skip this exercise, and focus on the Arch & Flatten. Do Scapula Scoops Part 2 to release pectoral muscles.

**Side Curl:** Just do the leg movement, and don't lift the head.

**One-sided Arch & Curl:** You can teach this as the “One-sided Arch & Flatten.”

**Iliopsoas Release:** Just lift the leg, not the head, but make sure the student keeps their lower back pressed firmly into the floor.

**Diagonal Arch & Curl:** You can teach this as the “Diagonal Arch & Flatten.”

**Flowering Arch & Curl:** You can teach this as the “Flowering Arch & Flatten.”

**Head Lifts:** Skip this until it becomes comfortable.

**Diagonal Curl:** Skip this until it becomes comfortable.

**Following are the best exercises to work directly with the neck and shoulder muscles and associated patterns of tension.** Teach modifications, lying down or sitting up, when necessary. I've made a few notes about modifications. If any of the exercises increase your student's pain, skip them for now or do them without lifting the head.

**Arch & Flatten:** If this or any exercise practiced lying on the back is uncomfortable for your student's neck, put a folded towel or thin pillow under their head and neck. Only use as much padding is needed to make their neck comfortable; don't overdo it. Reduce the padding as they are able to.

**Back Lift:** If turning the head to the side is not comfortable, your student can do this with their neck straight and head facing the floor, with their forehead on the floor so that the back of the neck stays long. If lying on their stomach is not comfortable, skip it.

**Upper trapezius release:** This is at the end of the Bonus Video: “Ultimate Pandiculation.” This exercise can be done standing or sitting upright.

**Arch & Curl:** Use padding under the head as described in Arch & Flatten, if necessary.

**Side Curl:** Be sure the student supports the weight of their head with their hand. If the movement is still not comfortable, then teach just the lower body part of this movement – it will still help to release the obliques.

**One-sided Arch & Curl:** Use padding under the head as described in Arch & Flatten, if necessary.

**Diagonal Arch & Curl:** Use padding under the head if necessary.

**Washcloth:** Start by focusing on just the upper body part of this exercise. Use padding under the head if necessary.

### **Shoulder, Elbow, Wrist, & Hand Releases**

**Flowering Arch & Curl:** Start by focusing on just the upper body part of this exercise. Use padding under the head if necessary.

**Head Lifts:** Use padding under the head if necessary.

**Lower Back Release:** Use padding under the head if necessary.

### **Proprioceptive Exercise 1**

**Scapula Scoops Part 1:** Use padding under the head if necessary.

**Scapula Scoops Part 2:** Use padding under the head if necessary.

**Diagonal Curl:** Use padding under the head if necessary.

### **Shoulder Directions**

**Shoulder, Elbow & Wrist Releases:** Same modification as Arch & Flatten if necessary.

### **Seated Twist**

### **Standing Hamstring Release**

### **Head & Knee Lifts**

### **Face & Jaw Exercises**

**A note on neck rotation:** It's natural to assume that when you turn your head to the right, the muscles on the right side of your neck are contracting to do the movement. But this is not true for all of the muscles involved!

The upper trapezius, sternocleidomastoid, and scalene muscles all rotate the head and neck to the **opposite side** when they contract; this is because of their attachment points. This is a very important concept to understand if your student experiences pain when they rotate their head to the side. For example, if they feel pain on the right side of their neck when they turn their head to the right, the pain is likely the result of them stretching tight muscles on the right side of their neck as they turn their head. They will feel this pain even more if they lie on their stomach and turn their head to the side (like in the Back Lift).

If this is an issue for your student, you can talk them through this exercise:

While sitting up, slowly turn your head as far to the right as possible. The farther you go, the more you should notice the muscles on the left side of your neck contract (focus on feeling the location of your upper trapezius; left side of base of neck into the shoulder area). You might notice your left shoulder lifting up because the upper trapezius is contracting. When you've rotated as far as you want to go, and felt that contraction, consciously release that contraction as slowly as you possibly can, letting your head and neck very slowly rotate back to center.

Now try this on the other side. Slowly turn your head as far to the left as possible. The farther you go, the more you should notice the muscles on the right side of your neck contract (focus on feeling the location of your upper trapezius; right side of base of neck into the shoulder area). You might notice your right shoulder lifting up because the upper trapezius is contracting. When you've rotated as far as you want to go, and felt that contraction, consciously release that contraction as slowly as you possibly can, letting your head and neck very slowly rotate back to center.

### **3. Educate your student on how they can improve their body use during, or reduce the amount of time spent doing, repetitive activities that might be causing or contributing to their neck pain and tension.**

**If your student works at a computer,** help them to become aware of how they are using their body as they work. Working at a computer involves inwardly rotating the shoulders and bringing the arms forward, more so on one side when using a mouse. It's also very easy to adopt forward head posture or rounded posture if they tend to lean in toward the computer screen. Suggest that they zoom into what they're looking at so they don't have to lean forward, and that they adjust their chair, desk, keyboard and screen position so they can sit in the most neutral position possible.

Suggest that they check in with themselves every few minutes and relax their abdominals, chest, and shoulders. They should not contract their back muscles and force themselves to sit up straight; instead, they should relax their abdominals and allow themselves to sit up straight. Likewise, they shouldn't pull their shoulders backward; they should relax their chest and shoulders and allow their chest to open up and their shoulders to relax back.

**If your student uses a smartphone for long periods of time:** Looking downward at a phone for hours a day will inevitably lead to forward head posture and neck pain; this is why we see more and more teenagers with forward head posture. Suggest to your student that they: use their phone less, and/or find a way to hold their phone so that they don't have to look downward. When using their phone, they should take frequent breaks to lift their head up and relax into a straight, upright posture.

If your student talks on the phone a lot, they should put it on speaker or use a headset or earpiece so that they don't have to hold the phone to their ear. Holding the phone to the ear

for long periods of time will lead to chronic tightness on one side of the neck, and likely in that shoulder as well.

**Driving:** Encourage your student to notice their posture when they're driving. Do they lean forward or crane their head and neck forward? Do they lean to one side? Do they feel tense? Encourage them to try to relax their abdominals, chest, shoulders, and neck as described in the computer work section. They should adjust their headrest to the most comfortable position, and try to use both arms evenly to control the steering wheel.

**Holding something on one side:** We tend to carry things like a purse, a backpack, or a baby on the same side all the time. Not only does this lead to tight neck and shoulder muscles, but these simple habits can even lead to side-bending postural patterns like functional leg length discrepancy. Encourage your student to try holding their bag or their child on the opposite side, and notice how it feels. They should alternate sides as much as possible, even if it feels awkward in the beginning.

**Sleeping:** Sleeping position has a big impact on the neck muscles. Sleeping on the stomach is worst for pain and tension, because it keeps the head turned to the side for 6-8 hours per night, and puts pressure on the lower back. Side-sleeping is fine as long as the spine is in alignment. Sleeping on the back with no pillow is best. Sleeping on the back with a pillow is like spending 6-8 hours per night in forward head posture.

The best sleeping positions to reduce neck pain are:

- **On the back with no pillow:** If this is not comfortable for your student, instruct them to do all of the Arch & Curl variations and the Head Lifts on a regular basis, and gradually reduce the thickness of their pillow if possible. If their lower back is not comfortable when lying on their back, they should do the Back Lift on a regular basis, and put a pillow under their knees when they sleep on their back.
- **On the side with the spine in alignment:** Educate your student that their mattress should allow their shoulder and hip to sink in enough that their spine remains straight when lying on their side. Too firm or too soft a mattress will move the spine out of alignment. Their pillow should support their head and neck so that their cervical spine is straight. They should alternate which side they sleep on as much as possible. If sleeping on one side is not comfortable, their obliques are probably tight on that side; instruct them to do the Side Curl to release that side several times before getting in bed.

# WHIPLASH

## What is whiplash?

Whiplash is one of the most common acute injuries that results in chronic pain. Some sources estimate that up to 3 million people suffer from whiplash in the U.S. every year.

Whiplash commonly occurs in car accidents when the head and neck are first thrown backward into hyperextension and then forward into hyperflexion from the impact. Whiplash can also occur when the head is suddenly thrown from side to side, such as when a car is T-boned.

Studies show that at least half of the people who experience whiplash go on to develop chronic neck pain and related symptoms, collectively referred to as “whiplash associated disorders.” The sudden, extreme degree of movement can injure many structures of the neck and surrounding parts of the body:

- **Muscles** in the neck and shoulders can be strained or thrown into spasm
- **Ligaments** that connect the cervical vertebrae and skull can be sprained
- **Cervical facet joints** (the joints in between vertebrae) and the atlanto-axial and atlanto-occipital joints (the junction between the neck and skull) can be damaged
- **Cervical intervertebral discs** can bulge or herniate
- **Cervical vertebrae** can be dislocated or fractured
- **Joints adjacent to the neck** (temporomandibular joint and joints in the thoracic spine, ribs, and shoulders) can be damaged
- **Nervous system structures** including nerve roots, the spinal cord, and brain can be damaged
- **Vascular system structures** including the vertebral artery and internal carotid artery can be stretched and torn
- **Vestibular system structures** of the inner ear can be damaged

## What causes whiplash?

Whiplash can occur in a variety of activities that involve sudden movement or impact to the head:

- Automobile accidents
- Physical abuse or assault; being punched or shaken
- Sports such as football, boxing, karate, hockey, field hockey, volleyball, basketball, and soccer
- Cycling accidents
- Horseback riding
- Bungee jumping
- Amusement park rides
- Falls in which the head violently jerks backward

## Symptoms of whiplash

Symptoms of whiplash usually develop within 24 hours of the injury and can include:

- Neck pain and stiffness
- Limited range of motion in the neck
- Headaches, most often starting at the base of the skull
- Tenderness or pain in the shoulders, upper back, or arms
- Tingling or numbness in the arms
- Dizziness
- Concussion
- Tinnitus (ringing in the ears)
- Visual problems
- Sleep disturbances
- Fatigue
- Memory and concentration loss
- Irritability
- Depression

Some research estimates that 50% of whiplash sufferers go on to develop long-term symptoms. A 20-year prospective study found the number to be higher; of 193 people who had experienced whiplash, 66.9% developed chronic related symptoms. These symptoms included stiff shoulders, neck pain, headache, numbness or pain in the upper limbs, and tinnitus.

Orthopedic surgeons from London conducted a four-year study of 1025 whiplash sufferers in an effort to understand the cause of long-term whiplash symptoms. They found that the “only totally consistent findings are reduced range of motion and dysfunction of the trapezius muscle.” The researchers suggest that whiplash rehabilitation should target neck stiffness and trapezius dysfunction in particular.

Another study used surface electromyography (EMG) to measure cervical muscle dysfunction in whiplash sufferers. The study found that people with whiplash associated disorders had higher levels of muscle tension than healthy control subjects in their upper trapezius muscle during physical exercise, and a significantly decreased ability to relax the upper trapezius after exercise.

About a second after the head is forcefully thrown or hit, neck muscles reflexively contract in an attempt to stabilize the head. After the injury, the muscles of the neck, and often the shoulders and back as well, remain contracted to splint the injury. Not surprisingly, nearly 9 out of 10 whiplash sufferers have some degree of muscle spasm following the injury.

Chronic muscle contraction is a likely cause of or contributor to many whiplash associated disorders. Chronically contracted muscles feel stiff and painful, and restrict movement of the neck. They limit blood flow, slowing the healing process of injured discs and connective



tissues. Tight muscles also compress the spine, potentially causing nerve impingement, inflammation, and disc and joint degeneration.

Reflexive muscle contraction often continues long after a structural injury has healed, because muscle contraction becomes learned by the nervous system. So the longer it takes for structural whiplash injuries to heal, the more likely it is that the surrounding muscles will continue to splint the painful area and remain chronically, subconsciously contracted for years.

Another factor that increases the likelihood of developing chronic muscle tension is the emotional trauma of being in a car accident or experiencing any event that causes injury. Strong negative emotions not only trigger muscle tension but also cause that muscle tension to become deeply learned quickly. Instead of requiring many repetitions like practicing a tennis swing, the nervous system immediately learns to keep certain muscles tight, and links that subconscious muscle tension with the emotional state. Researchers have found that an important predictor of whiplash associated disorders 12-14 years later is being in a negative emotional state in the days following the injury. And a study of 6,000 whiplash sufferers found that those who had a positive attitude about their recovery recovered more than three times faster than those who didn't, and those who had low expectations of complete recovery were four times more likely to experience long-term symptoms.

## **How to work with whiplash**

Clinical Somatics exercises are an ideal method of recovery for many whiplash associated disorders because pandiculation is the most effective way to release subconsciously held muscle tension. In addition, the exercises are extremely slow and gentle, and can be modified or substituted if the position or movement is painful.

People with chronic pain and limited mobility resulting from whiplash should work with releasing all of the muscles of the neck, shoulders, upper and lower back, chest, and abdomen. Even if pain is not present or tension is not felt, the musculature of the entire upper body has adapted to the injury, and the overall pattern of tension and posture must be addressed in order to make lasting progress. Releasing chronic muscle tension will also prevent future spinal degeneration and often relieve nerve impingement by reducing pressure on the spine and spinal nerves.

People suffering from whiplash associated disorders may also benefit from methods of stress reduction, and potentially talk therapy to address psychological trauma related to their injury.

Refer to the list of exercises in the Neck Pain section, and modify as necessary for your student.