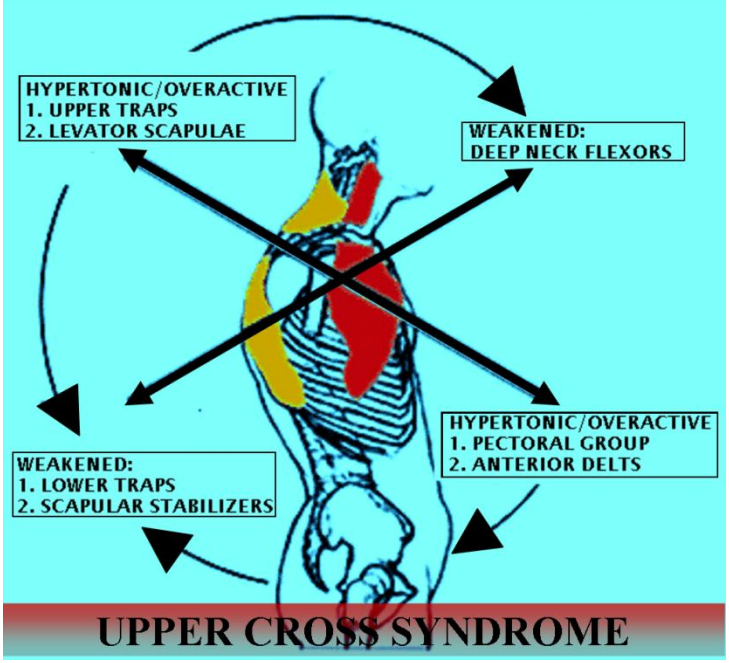
▫Swimming and Neck Pain

While swimming is typically a sport free from traumatic injury and easier on the joints, the high number of strokes can often lead to repetitive stress injuries. These injuries are typically due to the high number of repetitions in conjunction with faulty stroke mechanics. Repetitive stress injuries are most often seen in the shoulder, reported in 15-80% of competitive swimmers at any level. (1) While "Swimmer's Shoulder" is a significant condition among the swimming community. It is also effectively treated with Active Release Techniques and conservative care, it is not the focus of this article. What is not always recognized is the way the shoulder muscles are connected to the cervical spine and can result in neck pain.

The anatomy of the neck is quite complex due to its mobility and function. The bony anatomy of the neck, known as the cervical spine, consists of seven cervical vertebrae. The spinal cord runs through the vertebrae, from the brain, and down the back. Exiting between each of the vertebrae are spinal nerves. These spinal nerves travel to the muscles, joints, and the skin of the hands, arms, neck, shoulder, and upper back. Furthermore, there are many muscles in this region that span the neck, shoulder, and upper back. Joint dysfunction, trigger points, tightness, headaches, pain, tingling, numbness, and/or weakness in any of the areas mentioned above may be stemming from the cervical spine. (2)

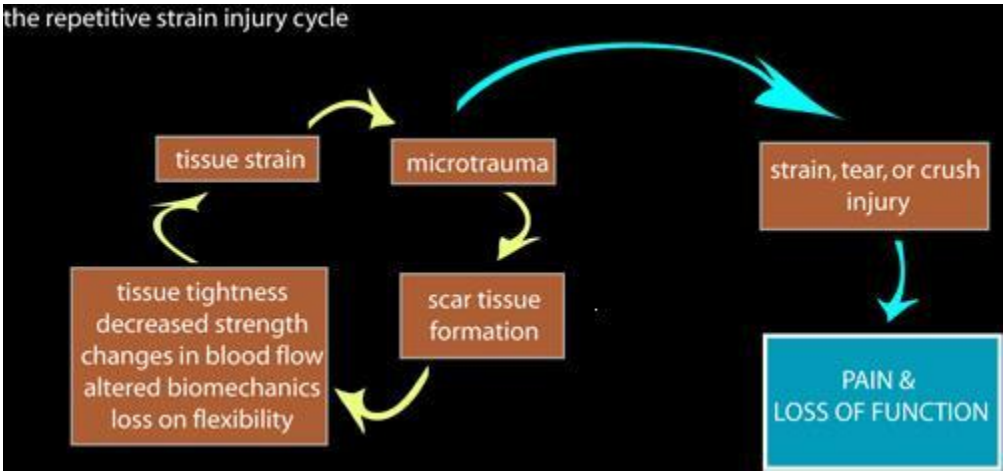
These pains are often caused by strains due to improper postural habits in our everyday lives. Postural imbalances can lead to tightness in certain muscle groups of your neck and shoulders. It can also lead to weakness in other muscle groups. Swimmers may often develop what is known as the upper cross syndrome (see fig. 1). This occurs when you develop tight cervical/upper trapezius and pectoral muscles, and weak anterior deep flexor and lower trapezius muscles. (2) A forward positioning of the head and cervical spine, rounded shoulders, elevated shoulders, winged scapulae, along with an exaggerated kyphosis of the thoracic spine is characteristic of this upper cross syndrome. (3) This syndrome is due to the muscle recruitment patterns required for swimming and made worse by poor postural habits when out of the pool. The combined result of this posture is that cervicocranial, cervicothoracic, glenohumeral, and temporomandibular joints are all overstressed. These imbalances make achieving proper stroke mechanics difficult and increase the likelihood of an injury. Over time the wear and tear of improper stroke mechanics will lead to dysfunction in the neck and shoulder. This will eventually result in tissue injury and pain.



-The upper cross syndrome was originally Dr Vladimir Janda, known as the "Father of Rehabiliation."

As time goes on and the athlete continues to train, the strain will develop microtrauma. Initially, this micro-trauma is not painful but may be percieved as a mild ache or tightness in the muscles, neck, or shoulder. Regardless of how small the trauma may be, the damage still needs to be repaired. The body responds to this tissue injury in a very predictable way – by laying down new tissue to repair the damaged area. With micro-trauma, the body repairs the strained tissue by laying down small amounts of scar tissue in and around the injured area. The scar tissue itself is not a problem – in fact, it is a normal and necessary part of healing.

The problem occurs when the body is subjected to the same repetitive damand over and over again. This in turn cause the same muscles to become strained and subsequently repaired over and over again, aka "the repetitive strain cycle" (see diagram). Eventually this scar tissue will build-up and accumulate into what are called adhesions. These adhesions start to affect the normal health and function of the muscles. In fact, they will often lead to pain, tightness, stiffness, restricted joint motion, and diminished blood flow. (3)



Any neck pain should be addressed by a practitioner, such as a orthopedist, chiropractor or physical therapist, who is knowledgeable in the diagnosis and treatment of musculoskeletal conditions. Treatment for these types of injuries include:

- Manipulation/Mobilization – To restore joint motion.
- ART (Active Release Techniques) – To: 1) break up scar tissue adhesions, 2)reinstate normal tissue flexibility and movement, and 3) more completely restore flexibility, balance, and stability to the injured area and to the entire kinetic chain.
- Cold Laser Therapy -
- Rehabilitation – to strengthen specific scapular stabilizing muscles and proper stretching exercises of shortened muscles.
- Modalities – Ultrasound, E-Stim, Kinesio-Taping (Straping), Cold/Heat Therapy

During the acute pain phase, manipulations, ART, laser, and modalities are great for decrease pain and getting your body back on the healing track. Once you are out of the acute pain phase, rehabilitation for the condition will likely be necessary along with options utilized during the acute phase. This may include: stretching to lengthen any muscles that may have become shortened/hypertonic; and the strengthening of weak/inhibited muscles that need to be activated. When pre-injury status is achieved and you are now ready to enter the pool it would be wise to have a swimming coach analyze your swim stroke. Coaches can point out small subtleties, which may be affecting your neck directly or indirectly. Maximized health and function along with proper stroke mechanics will greatly reduce the odds of re-injury and will enhance your swimming potential.

Like health in general, prevention should always be the goal. Don't wait until you have symptoms, such as pain, to get help. Always be proactive. Healthy habits, nutrition, exercise, along with great spirits will lead to an excellent state of health that will keep you swimming, biking, and running for the years to come.

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(2) Greys Anatomy of the Human Body.

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ART Active Release Techniques ®