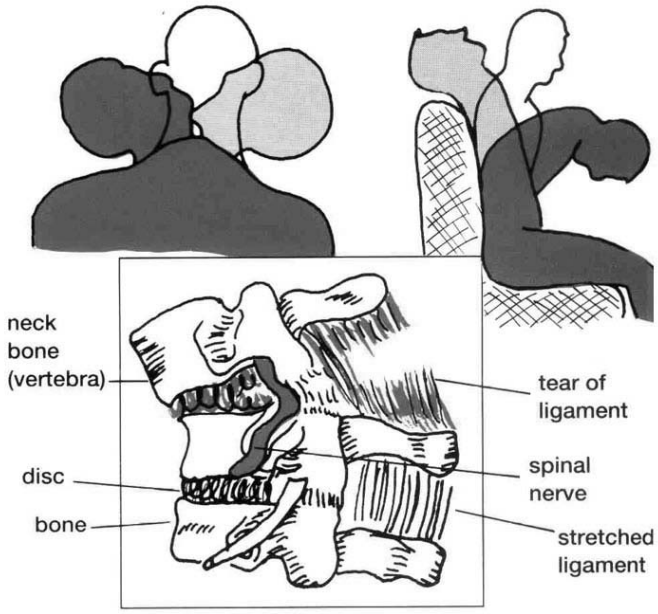
WHAT IS WHIPLASH AND HOW IT COULD BE TREATED?

By Grania Ingleby

Whiplash is an acceleration-deceleration mechanism of energy transfer to the neck. It is a common injury from rear-end or side-impact motor vehicle collision. It can also occur through sports. Common whiplash is a trauma causing cervical musculo-ligamental sprain or strain due to hyperextension-flexion. It excludes fractures or dislocations of the cervical spine, head injury or alteration of consciousness. Chronic or late whiplash syndrome refers to persistent symptoms present more than 6 months after the accident. In 1995 The Quebec Task Force proposed a classification for whiplash injuries:

- Category 1: neck complaint without musculoskeletal signs such as loss of mobility
- Category 2: neck complaint with musculoskeletal signs such as loss of mobility
- Category 3: neck complaint with neurological signs
- Category 4: cervical fracture or dislocation. Evans (2006)



In hyperextension the anterior longitudinal ligament can be stretched or torn. In cases of severe hyperextension, cervical spondylolysis can occur. Hyperflexion occurs as the head rebounds, snapping the head onto the thorax and can cause locking of the cervical vertebrae through dislocation of the cervical vertebrae. Taylor (1994) concludes that some traumatic sprains do not heal as there is tearing of endplates or discs and to facet joints. Vasavada *et al* (2007) concluded that the muscles of the neck fire too late in a rear-end collision to prevent injury to the spine and ligaments. When an occupant is struck from behind, the force travels from the back of the car through the occupant finally exiting through the front, in a very short period of time. To protect the body, the muscles of the neck contract to prevent injury. These muscles have been shown to fire at 100 milliseconds post impact, which is 25 milliseconds after the majority of damage has occurred to the ligaments of the neck. Brault *et al* (2000) also assessed the potential for cervical muscle injury from a rear-end automobile collision and also concluded that cervical muscles contract rapidly in response to impact and the potential exists for muscle injury due to lengthening contractions. Muscle activation level varied significantly with speed change, motion phases and muscle group. Initial rearward retraction of the head relative to the torso resulted in lengthening of the activated sternocleidomastoid, consistent with a contraction-induced muscle injury. Sternocleidomastoid onset preceded paraspinal onset. Consequently the therapist should recognise the role of cervical retraction in the mechanism of whiplash injury and avoid aggressive motion in that plane during diagnosis and treatment.

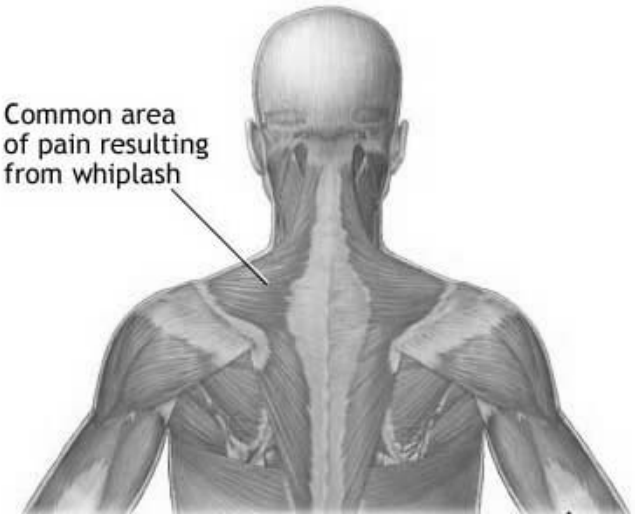
The symptoms that can be displayed are:

- **Neck and Back Injuries:** myofascial, fractures and dislocations, disc herniation, spinal cord compression, spondylosis, radiculopathy, facet joint syndrome, increased development of spondylosis, jaw, neck and back pain
- **Headaches:** muscle contraction headache, greater occipital neuralgia, temporomandibular joint injury, migraine and third occipital headache

- **Dizziness:** vestibular dysfunction, brainstem dysfunction, cervical origin, barre syndrome, hyperventilation syndrome, and imbalance
- **Parasthesias:** trigger points, thoracic outlet syndrome, brachial plexus injury, cervical radiculopathy, facet joint syndrome, carpal tunnel syndrome, ulnar neuropathy at the elbow
- **Weakness:** radiculopathy, brachial plexopathy, entrapment neuropathy, reflex inhibition of muscle contraction by painful cutaneous stimulation
- **Cognitive, somatic and psychological sequelae:** memory, attention and concentration impairment, nervousness and irritability, sleep disturbances, fatigability, depression, personality change, compensation neurosis
- **Visual symptoms:** convergence insufficiency, oculmotor palsies, abnormalities of smooth pursuit and saccades, horner syndrome, vitreous detachment
- **Rare sequelae:** torticollis, tremor, transient global amnesia, oesophageal perforation and descending mediastinitis, hypoglossal nerve palsy, superior laryngeal nerve paralysis, cervical epidural haematoma, internal carotid and vertebral artery dissection. Evans (2006)

In some cases it can take up to 2 years for the pain to settle completely and it may still recur.

Ligaments heal slowly in the neck because of their lack of blood supply and they do not get adequate rest due to the demands of the neck on a day-to-day basis. The healthy tissue is replaced with scar tissue, which is not as flexible or as strong. Therefore treatment should maintain mobility by spinal muscle energy techniques and stretching. Once the injured areas have become less painful the supporting muscles that have been injured need to be strengthened to prevent flare ups. Vasavada *et al* (2007)



Treatment can begin once the acute phase has passed, the client has been x-rayed for fractures if suspected and safety tests have been performed. The application of ice, carefully, for short periods, in the first 24 hours to reduce inflammation is a common practice. Gentle exercises at home help to reduce stiffness. ***Research has shown that those whot rest for several weeks and wear a soft collar recover more slowly than those who try to follow a normal routine.***

Treatments that can be included in session are: cervical joint capsule work to 'melt' any joint capsule adhesions and to pump synovial fluid into the neck, myofascial release on the upper trapezius and cervical muscles (especially SCM and scalenes) and stretches. Gentle neck traction, interspinales, rotators and intertransversarii balance via myofascial release and suboccipital muscle release, Waslaski (1996). Rectus capitis posterior minor is an important occipital muscle to work on as strain to the muscle will reduce its proprioceptive input while facilitating transmission of impulses from a wide range of nociceptors, which could develop into a chronic pain syndrome such as fibromyalgia. Upper thoracic work and trigger point therapy are also required. Bogduk (2000) ascertained the relative and comparable efficacy of various therapies that are promoted for the resolution of whiplash-associated disorder. The results were that a home exercise program is superior to ice or passive mobilisation, which is slightly more superior to rest and analgesia. Short-term use of simple analgesics or non-steroidal anti-inflammatory agents might be useful while patients undergo natural recovery. There is no evidence for the use of major tranquillisers or tricyclic antidepressants. Traction, electromagnetic therapy, collars, transcutaneous electrical nerve stimulations, ultrasound, neck school, spray and stretch, laser therapy, and/or traction should not be used in the treatment of acute neck pain after whiplash.

Sterling *et al* (2002) showed that subjects with chronic whiplash associated disorder had a decrease in pressure pain thresholds in sites both local and remote to the site of injury suggesting a sensitised central nervous system, which was contributing to the persistent pain experienced. This decrease in pressure pain thresholds over cervical spine sites may reflect the continuing role of sensitised nociceptors within the cervical spine in the pain syndrome. Koelback Johansen *et al* (2001) also concluded that muscle hyperalgesia and large referred pain areas were found in patients with chronic whiplash syndrome within and outside the traumatised area. The findings suggest a generalised central hyper-excitability in these patients and that the pain might be considered as a neurogenic type of pain.

Clients following a car accident can be extremely anxious and stressed in themselves. This combined with a neck injury, can exacerbate the problem, as the client can be worried about moving the neck. Consequently relaxation exercises, yoga and, of course, massage can be integral to their recovery.

Bibliography

- Bogduk, N. 2000. Whiplash: "Why pay for what does not work?" Journal of musculoskeletal pain. Vol 10 pg 29-53
- Brault, J R, Siegmund, G P, Wheeler, J B (2000). Cervical Muscle Response during Whiplash: Evidence of a Lengthening Muscle Contraction. Clin Biomech. Jul; 15(6)

Grania Ingleby has just completed the Advanced Remedial Massage course and is in practice in Linlithgow and Bridge of Allan in Remedial & Sports Massage. She can be contacted on 07793 886182.