Yoga therapy for whiplash

(W.M. van Poelje, 2007)

1 - Case study summary

"Saskia" is a 31-year-old financial administration assistant with a chronic whiplash condition. I met her at the health center where I teach yoga. When I first examined her – seven months after a car accident – she had very limited neck mobility and poor neck strength. Shoulder flexion was limited. Saskia was in constant pain, especially at the trapezius origins, and moving her neck exacerbated this pain. She had stopped working because of whiplash-associated disorders.

We worked together for three and a half months. During the first seven weeks, we gradually introduced the joint freeing series. As a result, Saskia's neck mobility improved significantly, and the upper trapezius regained its strength. Saskia could now move to end of neck ROM without increasing her pain. We then started with neck strengthening exercises. At this point, there was a relapse into severe lower back pain, most likely caused by osteopathic spine manipulation. When this pain subsided, Saskia resumed the full JFS series. About eight weeks later, shoulder flexion became normal. Currently, neck mobility is close to or beyond normal. However, the sternocleidomastoids are still weak.

Saskia's overall pain level (4/10) has not changed from the beginning of yoga therapy, but there are fewer days when her pain peaks to 8/10. Saskia has taken up volunteer work that matches her current condition (a few hours a week).

The present document is a summary of the complete paper that can be found here.

a – Range of Motion Assessments 2007							
Joint Action	**ROM**	**May 14**	**May 14**	**July 3**	**July 3**	**Aug 29**	**Aug 29**
	Normal	Left	Right	Left	Right	Left	Right
NECK							
Extension	55°	**46 ***		61		69	
Flexion	45°	**23 ***		54		56	
Lateral Flexion	45°	**35 ***	**35 ***	45	42	44 **	42 **
Rotation	70°	**38 ***	**43 ***	61	62	64 **	67 **
SHOULDER							
Abduction	40°	**28**	**26**	30	35	29	31
Adduction	130°	130	115				
External Rotation	90°	96	98				
Internal Rotation	80°	78	80				
Flexion	180°	**145 ***	**145 ***	145 *	145 *	180	180
Extension	50°	45	46				

(*) ROM limited by pain at specific points: flexion (trapezius origins on occiput), extension and lateral flexion (spine near T2), left rotation (trapezius origin, dizziness), right rotation (trapezius origin and lateral base of neck, dizziness), shoulder flexion: trapezius on top of shoulders.

(**) Passive lateral flexion is accompanied by a slight increase in pain (spine near T2). Rotations cause slight dizziness when held long enough for a goniometer reading.

b- Muscle Testing Assessments 2007						
Joint Action	**May 14**	**May 14**	**July 3**	**July 3**	**Aug 29**	**Aug 29**
	Left, 1-5	Right, 1-5	Left, 1-5	Right, 1-5	Left, 1-5	Right, 1-5
NECK						
Extension	**2**		5		4	
Flexion	**2**		2		2	
Lateral Flexion	**2**	**2**	2	2	2	2
Rotation	**2**	**2**	2	2	2	2
SHOULDER						
Flexion	5	5				

c - Summary of findings during initial assessment 2007		
What is tight?	What is weak?	What needs to be released?
Upper trapezius	Upper trapezius	Upper trapezius
SCM (forward head)	SCM	
Erector spinae (cervical)	Erector spinae (cervical)	

SCM = sternocleidomastoid

2 - Whiplash

2a Name of description of the condition

Whiplash is an acceleration-deceleration mechanism of energy transfer to the neck. It often occurs during car accidents. The rapid neck movement typically results in damage to ligaments and muscles. Although rear-end and side-impact car accidents are the most common cause, similar injuries may result from roller coaster rides, diving, rugby, or by being hit or shaken.

Usually whiplash injury causes damage to the soft tissue of the spine (ligaments, muscles and tendons). It is often accompanied by neck pain, headaches, reduced neck mobility, and dizziness. These symptoms may last for a couple of days and often subside in three to six weeks. In other cases, whiplash symptoms will persist for months or years. More severe damage is also possible, and this involves neurological symptoms or even fractures. There are several grades of whiplash injury:

Quebec classification of whiplash associated disorders {Spitzer, 1995}	
Grade 0	No complaints or physical signs
Grade 1	Complaints of neck pain, stiffness or tenderness only but no physical signs are noted by the examining physician
Grade 2	Neck complaints and the examining physician finds decreased range of motion and point tenderness in the neck
Grade 3	Decreased range of motion plus neurological signs such as decreased deep tendon reflexes, weakness, insomnia and sensory deficits
Grade 4	Neck complaints and fracture or dislocation, or injury to the spinal cord
	Symptoms and disorders than can be manifest in all grades include deafness, dizziness, tinnitus, headache, memory loss, dysphagia (difficulty swallowing), temporomandibular (jaw) joint pain.

2b – Gross and subtle body common symptoms

A whiplash victim will often be in acute neck pain during the first four days. When this subsides, a wide range of other symptoms remains (table on next page).

The symptoms include neck and back pain and reduced neck mobility. The whiplash motion may also affect the head – even without impact – and this accounts for symptoms like sensitivity to light, diminished or blurred eyesight, tinnitus, difficulties in swallowing, pain in the jaw joint, memory loss and concentration problems. Dizziness occurs when the nervous system receives conflicting information from different parts of the body's balance system (eyes, inner ears, the body's sense of where it is in space). In the case of whiplash, sensory receptors in damaged cervical facet joints may relay incorrect information. Damage to the cervical discs can put pressure on the nerve roots, which then causes pain in the arms and tingling sensations in the hands. All of these symptoms may occur straightaway or with a delay of up to three days. Concentration problems, fatigue, anxiety, depression, and sleeping problems often accompany whiplash injury.

When symptoms persist for more than six months, whiplash has become chronic. There are conflicting data on this. The estimated proportion of people who report pain and disability after six months varies between 19% and 60% {Spitzer, 1995}. The percentage of people who are

still absent from work after six months varies between 9% and 26% {Stovner, 1996}. Some whiplash victims (guestimate 10% – 45 %) will have symptoms for more than two years.

Whiplash symptoms {Stovner, 1996}		
Symptoms reported	< 4 weeks after the	6 months later
Neck pain	90 – 100 %	10 – 45 %
Reduced neck mobility	40 – 95 %	14%
Headache	50 – 90%	8 – 30%
Sensitive to light	30 – 80%	
Pain in shoulder or arm	40 – 70%	5 – 25%
Dizziness	20 – 70%	3 – 20%
Problems concentrating	20 – 60%	5 – 21%
Fatigue	60%	
Anxiety	45 – 50%	5 – 12 %
Diminished eyesight	20 – 45%	3 %
Depressive complaints	45 %	5 – 10 %
Back ache	35 %	
Sleeping problems	35 %	
Irritability	20 %	9 – 14 %
Tingling sensations in the hand	10 – 15%	
Loss of libido		7 %

2c Related challenges – lifestyle, diet, limitations on activities

Whiplash injury can have a significant impact on a client's family, social, and working life. Some will be limited in their daily activities (childcare, housekeeping), others have to give up favorite activities (tennis, rugby), and some will not be able to work for a long time. The disorders that accompany whiplash injury, such as concentration problems, fatigue, anxiety, depression, sleeping problems and irritability - are serious enough by themselves.

Saskia - my case study client - had to stop working because of her whiplash symptoms (headaches, lack of concentration). She finds it difficult to clean her house and can no longer participate in her favorite sports (diving, fitness). Ten months after the accident, she has still not resumed work.

3 – Ayurvedic assessment and Ayurvedic based yoga recommendations

The first few days after whiplash injury there may be some inflammation and swelling due to torn ligaments. The inflammation is a pitta imbalance, which can be treated with ice. Put ice in a towel (to avoid direct contact with the skin) and apply this for 15 minutes three to four times daily. Alternate this with a hot towel once a day to soothe soreness.

Subsequent whiplash symptoms like neck pain, limited mobility, headaches, fatigue, and loss of concentration are indicative of a vata imbalance. Pain reduction is achieved by rest (during the first few days) and by gradually resuming a normal daily rhythm afterwards. Relaxation (e.g. supine abdominal breathing) will balance vata. So will the joint freeing series. Gently moving the joints in coordination with the breath is the best strategy.

A stiff neck is a sign of kapha imbalance. Gentle massage will help to relax tight muscles. Gradually resuming normal daily life will keep the neck mobile and prevent tightening of scar tissue from causing further neck stiffness.

4 – Common body reading

Body reading will generally reveal a stiff and painful neck. Neck and shoulder ROM will be below normal. The primary neck movers (SCM, trapezius) may be weak.

Whiplash injury can happen to anyone. Chronic whiplash conditions are more common for women, the elderly, and clients with previous head trauma {Bekkering, 2005}.

5 – Contraindicated yoga practices and general activities to modify or eliminate

During the first four days after injury, all but the least afflicted clients should rest. Certainly, no work, yoga postures or sports activities should be undertaken.

During the first weeks after the injury, most activities should be modified. Avoid prolonged static postures because they stress the cervical spine (e.g. reading, personal computer, watching TV, painting a ceiling). All contact sports (e.g. football, rugby) and sports involving explosive force or overhead arm movements should be avoided (e.g. basketball, tennis, golf).

If severe pain does not subside within ten days after the accident, the client should return to the doctor. The client may be referred to a neurologist who will use diagnostic tools like X-ray and MRI scanning. The most severe cases of whiplash involve serious neurological symptoms and even bone fractures. Structural yoga therapy should not commence until these complications have been ruled out. Pranayama for pain management is always an option, though.

Some whiplash clients showing up for yoga therapy may be in severe pain. The SYT exam should not exacerbate their condition. The therapist should make clear to the client that the ROM tests should not increase the existing pain level. Keep communicating with the client and watch his facial expression to ensure that is so. Alternatively, the client could move into the neck and shoulder test position by himself (seated position). For muscle testing, the client moves into the position and holds it while counting breaths. A count of 12 breaths corresponds to strength of 5 {Stiles, 2000, chapter 18}.

Asanas that involve the neck, shoulders and upper back may initially do more harm than good. Avoid all poses that involve either toning or stretching of the sternocleidomastoid (SCM) and upper trapezius. This includes the following SYT asanas: extended triangle, downward dog, bridge pose, supported shoulder stand, abdominal twist, spinal twist, cobra, camel pose, face of light. Poses in which the arms are raised above shoulder level are likely to be painful and should be modified. E.g., perform warrior poses with hands on hips and the tree pose with hands in namasté. Poses that use the neck as a weight-bearing element (fish, headstand, plow, shoulderstand) are strictly forbidden.

Postural improvements will reduce neck pain {McKenzie, 2001):

- When seated, always maintain a lumbar curve by using a chair with a lumbar roll. This is a prerequisite for maintaining a proper neck position: Always maintain a retracted head. Retract the head as far as it will go and then release the last 10% of this movement. There are many references giving ideal ergonomics for the office workstation (feet on the floor, thighs horizontal, lumbar spine supported, straight upper arms, horizontal forearms, head looks down ~20º at the screen, use a book holder and a telephone headset).

- Modify working routines to have frequent breaks. Never sit for more than an hour without retracting the head and extending it five or six times. This applies especially to computer work and to long-distance driving.

- Sleep on a firm mattress and do not sleep on the stomach. Use a pillow that gives proper support to both head and neck. The pillow should fill in the natural hollow between the head and neck whilst keeping the head in a neutral position. Feather pillows are best, followed by fillings of chips made of rubber or foam plastic.

- Never slouch or protrude the head after vigorous activity. Thoroughly exercised spinal joints may distort if they are overstretched due to poor posture.

Whiplash injuries can be prevented to some degree by adjusting the car's seat. Obviously, the headrest should be at the proper height – top of the headrest level with the top of the head. In the driving position, the headrest should never be more than 6 cm (2,5") away from the back of the head. For most of us this means that we should adjust the backrest forward {Stemper, 2006}.

6 – General recommendations for the condition

6a – Therapeutic/free of pain

The first four days after a whiplash injury are focused on dealing with acute pain and inflammation. The GP may prescribe anti-inflammatory pain medication (e.g. Ibuprofen). Most clients should rest, except for those with mild (grade 1) injuries. Ice packs may be used for reduction of swelling. No yoga is to be practiced, except for relaxation in savasana and gentle pranayama to combat pain, e.g. abdominal breathing. Clients should be informed about the nature of whiplash injury and the recovery process. They may benefit from the knowledge that the long-term outlook is inherently unpredictable and that a gradual resumption of normal activities promotes recovery. Wearing a neck collar is no longer recommended for grades 1 – 2 whiplash {Bekkering, 2005}.

Rough time indication[1]	Objective	Yoga methods
First 4 days	Acute pain reduction	Ice, rest, pranayama for pain reduction
3 – 6 weeks	Pain reduction and neck mobility	Pain pranayama Very gentle joint freeing series (with modified shoulder movements)
6 weeks – 6 months	Flexibility and strength	Joint freeing series Exercises for toning neck and upper back
6 months – 1 year	Strength and flexibility	Asanas for neck and upper back

Over the next three to six weeks soft tissue healing takes place. During this period, the client should gradually resume normal activities. This is the prime recommendation made by Dutch physiotherapists, whose association states that the effects of massage and neck mobilization have not been sufficiently researched or their effectiveness has not been demonstrated {Bekkering, 2005}. These physiotherapists limit themselves to providing information on the whiplash condition and helping their clients to improve their coping style. However, structural yoga therapy could be applied in an attempt to reduce pain and to restore neck mobility. If a gradual and gentle approach is taken, the potential benefits of yoga may outweigh any risks and the time investment made by the client. The effectiveness of yoga therapy should be judged on a case-by-case basis, and this will become clear within a few sessions.

Whiplash pain is a vata disturbance. Therefore, the prime yoga therapy recommendation is the joint freeing series (JFS) coordinated with the breath. While it is important to work on the neck, it is advisable to practice the entire JFS series. The movements should not increase pain. Reduce the range and/or the number of repetitions if this is so. Shoulder movements should be modified to stay out of pain: Elbow flexion, shoulder rotation and shoulder abduction are done with extended arms below horizontal. Shoulder flexion is best done sideways. These modifications minimize the use of an injured upper trapezius.

As a refinement, the therapist may encourage the client to hold neck JFS positions at the end of ROM, asking the client what he feels and deliberately relax into the position with the breath. The therapist could also do some gentle bodywork at the end of the session. In a supine position, move the client's head into lateral flexion (or rotation) and ask him to relax into your hands. Both are pain reduction techniques.

In fact, pain reduction techniques should always be included in the program. Mukunda Stiles teaches several methods. He recommends the use of more than one technique because pain has vata qualities and changes all the time.

- Breathe into the painful area. First describe the pain and then breathe into the pain consistently for ten breaths. Allow your body to exhale but keep the prana there. Focus your attention on the pain and watch what happens. Mukunda Stiles says: "The breath is the bow, awareness is the arrow and the center of pain is the bull's-eye."

- Direct the breath below the navel consistently for two to three minutes while supine with the hands on the abdomen.

[1] The time frame is given only to show that there are different phases to the recovery process. Yoga therapy should always adapt to the individual and to the huge variability in whiplash symptoms.

- Feel the endpoints of the breath – the upper breath, the lower breath. Put your hands on the endpoints of the breath and observe.

- Do the joint freeing series coordinated with the breath (ujjayi samavritti pranayama).

Have the client describe the physical feeling, the emotions, and the mental image of the pain. Use the breath to calm a possible emotional release. See if the description provides leads for improving on life conditions. Decreasing stressors will reduce pain.

When pain has reduced and some of the stiffness has gone, proceed with strengthening exercises. It is best to wait at least six weeks after the accident before muscle toning. This gives soft tissue a chance to heal, although it should be noted that soft tissue might need six months or more to regain its full strength. Therefore, use a gradual and risk-free approach. Simple exercises are generally safer than the more complex asanas. A general principle of yoga therapy is to strengthen weakened muscles, especially those below the pain area. For whiplash, neck, upper and middle back muscles need to be strengthened. Muscles on the opposite – chest – side may need to be stretched.

Depending on the outcome of the muscle tests, make a selection of the exercises in the following table. Have the client move in and out of the poses on the rhythm of the breath. Gradually increase the number of repetitions over time. Always avoid pain, vibration, and muscle spasm.

Weak muscles	Recommendation
SCM	Supine SCM toning {Stiles, 2000}, ch.18
SCM	Supine twist with feet on the floor and knees together
Upper trapezius, levator scapulae, erector spinae	Cobra movement with arms extended backwards and back of hands on the floor
Upper trapezius, levator scapulae, erector spinae	Sphinx, lift and lower head in the pose
Middle & lower trapezius	Cat: focus on the upper back – squeeze shoulder blades on the inhale and broaden them on the exhale
Middle & lower trapezius, posterior deltoid, teres major, triceps, latissimus	Yoga mudra arms – kneeling position with hands behind back and fingers interlaced. Squeeze shoulder blades; reach down with knuckles, then lift arms towards ceiling.
Middle & lower trapezius, triceps	Cat bows with elbows close to torso

Refer the client to a bodyworker. Gentle neck and shoulder massage may be beneficial and this should be established in practice.

Avoid contact sports and activities with long static neck postures (section 5).

Focus on proper sitting and sleeping posture (section 5).

Encourage the client to keep an activity diary for a week. The diary should include activities, their duration, and the effect on pain. There should be about ten entries per day. The diary can be used to identify activities that increase pain. These activities should be modified, shortened, or eliminated. The client may need help in accepting the limitations imposed by whiplash.

Encourage the client to talk about the car accident. Do this in detail to help the client to detraumatize. If necessary, ask a psychologist to help your client. A technique like EDMR (eye movement desensitization and reprocessing) may be effective: only three two-hour sessions are required to treat trauma {Karsten, 1998}.

Encourage the client to develop active coping mechanisms. Generally, clients who seek distraction and strive for an active life will suffer from less pain. Yoga therapy is beneficial because it gives clients a degree of control over their own health. Support the client in resuming normal activities. Both overloading and underloading can be detrimental to recovery. It is best to gradually resume activities with sufficient time for breaks and rest. Lend a listening ear when insurance doctors and lawyers make life difficult. Litigation can obstruct the path to health.

A multidisciplinary approach is often recommended for whiplash conditions lasting for more than three to six months. A rehabilitation doctor will take charge of the client with the aid of a psychologist, physiotherapist, ergonomics expert and a social worker.

6b – Stabilize situation including lifestyle recommendations

Six weeks after the accident, soft tissue will have healed to a large degree. However, it may take six months or more than a year for it to regain its former strength. Once ROM and strength have improved, pain will generally be reduced. At this point, it is possible to resume asana practice. Be gradual and gentle when introducing asanas that tone or stretch the neck muscles (listed in section 5).

The following asanas are recommended {Stiles, 2000}:

Sternocleidomastoid (SCM)	Strengthen	Spinal Twist, Extended Triangle, Camel
	Stretch	Twisting poses
Upper trapezius	Strengthen	Camel, Cobra, Locust
	Stretch	Bridge

Do not practice asanas that put weight on the neck (fish, headstand, plow, shoulderstand). Avoid contact sports and maintain proper sitting and sleeping posture as described in section 5.

6c – Maintenance and long-term considerations

Continue with proper sitting and sleeping posture.

Continue with some form of neck exercise, e.g. JFS movements with breath coordination. The frequency depends on what is needed to stay out of pain (from several times a day to once a week).

7 – References and websites

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