

**Stiff Man Syndrome
(a.k.a. Moersch-Woltmann Syndrome)
and Lumbar Lordosis**

Structural Yoga Therapy Course

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1. Case Study

a – Initial intake - review of symptoms, subjective pain level, their self assessment and goals

Lilia is 42 years old, 5ft 7", weighs 140 lbs (64 kg) and works as an Environmental Business Consultant. Lilia lives 5 miles from work and keeps active through regular exercise, ringing church bells weekly (which she's done as part of a family tradition for over 30 yrs) and visiting friends most weekends. Lilia is open to the practice of the yoga therapy and alternative therapies.

Lilia suffers from a rare autoimmune neurological disorder, affecting the central nervous system, called Stiff Man Syndrome (a.k.a. Moersch-Woltmann Syndrome), diagnosed 7 years ago. This rare disease causes muscle rigidity, stiffness and lordosis. Lordosis is also considered as a condition as part of this paper. Stiff Man Syndrome is a progressive disease recognised as affecting about 1 person in 1 million; however Lilia feels that due to poor diagnosis it probably affects 1 person in 100,000; therefore there is no 'atypical' model. Many people who are eventually diagnosed are first sent to a psychiatrist following the symptoms and given a drug for the brain, which also relaxes the muscles appearing to treat the 'problem'.

There is a history of autoimmune illness in her family: both her mother and father's mother had thyroiditis (giving Lilia a "double-dose"). Her sister also has an autoimmune condition – Lupus; this turns the body's defences against the body itself, affecting the organ systems - skin, joints, and internal organs.

Lilia is a member of a support forum with 70 members from the UK – most of these sufferers are in wheelchairs and control their symptoms through use of pharmaceuticals. In the USA there are more cases and a larger forum. Lilia has shared her treatment with the forum in the past, but not recently. Lilia is not taking any conventional medicine for the management of her illness. Although acknowledging herself as "sceptical" as a scientist, Lilia is very open to complimentary therapies following more successful management of her condition with these than from conventional approaches.

Lilia's symptoms started to evolve following a thyroid condition, which she feels was triggered following a worm picked up during a work trip to India in 1988 and views it as "one of those things". After numerous trips to the doctors, Irritable Bowel Syndrome was diagnosed, but eventually, after symptoms did not reduce, thyroiditis was diagnosed in 1989.

Muscle spasms started in 1995 at age 30 and it was assumed by the medical profession that this was linked to the thyroid which when imbalanced can affect the muscles. The thyroid was removed in 1997 and Lilia began taking thyroxin. Spasms would start in the morning and take place every time she moved, including bladder release. There were no signs before an attack. Her back stiffened up and lordosis was diagnosed by a doctor following an x-ray. She was not told the angle of curvature, which is used as an indicator of lordosis. If startled Lilia would fall "like a log". Over the three years between 1997 and 2000 her posture changed in a negative way and her knees became hyper-extended (now ok). Symptoms worsened in 2000 and with the thyroid removed the medical profession had to look elsewhere. Lilia then had a droopy eye, especially when tired, which was diagnosed as ocular myothenis gravis, another autoimmune neurological illness. Stiff Man Syndrome was diagnosed shortly afterwards.

Other alternative therapy treatments

- Feldenkrais method of movement; Following initial symptom diagnosis Lilia saw a physiotherapist who recommend feldenkrais which Lilia practised for 4 years (1996-2000). This sent some of the symptoms into remission, and when no longer effective Lilia stopped practising it.
- Yoga; Lilia has practised weekly yoga with me since October 2005, with a modified practice (for example Lilia can't bend down or stand up in sun salutes (surya namaskar) so instead she begins the practice from kneeling on hands and knees ('table' position) and does 'cat' and 'dog' vinyasas.
- Herbalist/acupuncturist; Lilia has visited this practitioner every three weeks, since 1999 (time of ocular myothenis gravis diagnosis). He explained that he treats the liver and spleen to

keep them healthy and feels if he had been involved early enough he could have prevented more of the symptoms; now it is a case of maintaining her health at the current level.

- Cranial Sacral therapy; Lilia has received monthly treatments, since 2000, after time Stiff Man Syndrome diagnosis. After this treatment Lilia feels everything is much looser and very relaxed.
- Nutritionist; Lilia saw for 18 months from time of diagnosis to establish diet. At this time she was 35 lb (16 kg) overweight. Based on this advice her diet is now largely protein based (no yeast or bread and no “stodge”) as there is a risk of type 2 diabetes mellitus with the condition.

Other management

Lilia does the following exercises 6 days per week:

- Swims twice/week after work: 3 x 6 lengths each of sidestroke and backstroke (after work)
- Trampoline: four/week before work: 20 minutes plus 5 minutes stretching (self- taught). She would like these movements polishing
- Lilia is also a church bell-ringer which gives a strong right side.

Current situation

- no spasms since 2000
- no pain
- backache after standing for long periods
- feeling of “just stiff”
- restricted movements:
 - forward bending is the most difficult - struggles to put tights on
 - difficulty in getting up from sitting to standing and to go from standing to sitting
 - difficulty in sitting up straight with her legs out in front (stick pose - dandasana)
 - cannot step back into lunge position from standing forward bend (uttasana)
- when self conscious, stressed or anxious, symptoms worsen
- going down hills and stairs can be extremely difficult and cause anxiety
- Recent falls:
 - March 2006 (circumstances not given)
 - May 2007 – while on holiday in Brazil in May 2007 due to stumbling on uneven surface
 - June 2007 - after becoming caught in cables under desk and getting up to move away

Both of these last two instances “could have happened to anyone”; but due to the symptom of “falling like a log” Lilia ends up usually with injuries to the knees and hips.

- lifestyle adapted to “enjoy the present without compromising the future”
- problems with the immune system mean that infections are picked up easily

From an ayurvedic perspective, anxiety and neurological aspects suggest vata imbalance; from an anatomical perspective, difficulty on hills suggests gluteus maximus and psoas weakness.

Lilia’s Goal from Structural Yoga Therapy

Lilia’s goal is to bring flexibility into her lower back and abdominals as she feels both are contracting and release is needed. Lilia would also like to polish the exercises she is currently doing on the trampoline.

b – Physical assessment and posture body reading

The initial SYT assessment took place over four weekly one hour sessions beginning on the 26th March 2007 with the history being taken. Lilia stated her intention to be fully committed to a SYT programme as long as the exercises fit with her current programme.

2nd Session - 2nd April 2007.

ROM exam.

Lilia reported that she had begun to have diarrhoea, muscle aches and chills in the morning. Her herbalist defined this as too much damp in her system with the season changing from winter to spring.

3rd Session – 10th April 2007

Muscle test exam.

I observed Lilia becoming slightly emotional when I started to dive into more detail of the condition. I lightened up the conversation to keep her in a place of comfort and reassurance (*she was not ready to move to kosha 3 yet*). *On a couple of occasions I observed there are some kosha 3 issues as emotions and lack of confidence were evident which isn't surprising given the symptoms of the condition.*

When Lilia was not relaxed I found my vata also goes out of balance so once aware of this I apply grounding techniques and focus on my breath.

4th Session 17th April 2007

SYT Programme development.

Lilia seemed much more open, relaxed and at ease. This was complimented by the brighter clothes she was wearing – deep pink rose. I measured completely different readings for the hip flexor ROM test: an extra 5 degrees for bent leg and 30 – 40 degrees on straight legs.

At this point these findings were disregarded to ensure that the flexibility of the hamstrings and strength of the flexors were improved to encourage consistency in the readings.

Lilia was due to leave for a three-week trip to Brazil in a few days time. The programme outlined in Section D was given to her to practice. The next sessions were scheduled for the 21st May and 9th July.

Body reading

Pre exam

- Observing Lilia in the JFS on 6th November 2006 five months before the first SYT session revealed the following:
 - difficulty in sitting upright in stick pose
 - limited hip, knee and spine flexion
 - limited shoulder rotation, extension and scapula abduction
 - frequent shaking evident indicating possible muscle weaknesses
 - difficulty in balancing
- Observing her in yoga due to trunk/hip stiffness Lilia, cannot bend forwards to get her hands on the floor even with knees bent.

Initial Intake

- Very straight back
- Lordosis – the elbows are in line with her back, but her lumbar spine moves way inwards.
- SI joint very slight movement

21st May 2007 Interim assessment

Lilia carried out the SYT programme 6 times per week whilst on holiday in Brazil, although the fall half way through the holiday meant she needed to rest for 3 days until most of the swelling had gone from the knees; Upon returning from Brazil, Lilia saw her cranial sacral therapist for treatment. Lilia has only done the JFS once. Lilia finds the exercises “ok” to do.

Hamstrings released so suggested she move lower leg from bent to straight in single leg raises (hamstring stretch).

June 2007 Observations

Lilia continues to come to weekly yoga sessions and several observations were made:

- on several occasions (but not all) she was able to bend down and get her hands down into forward bend for sun salute
- still unable to step back into lunge from forward bend so does SYT programme while the rest of the class do sun salutes.
- the following poses seemed particularly beneficial:
 - working on pelvic tilt (bringing pelvis back) to isolate lumbar vertebrae
 - working with Wall Hang to focus on spine (As stress relieving will help to balance vata). Suggestion to do this at the end of the day before retiring. Then lay in bed with yoni-mudra on abdomen
 - JFS #6 Down Cat tilt
- balancing focus and use of mulha bandha to help strengthen inner core (this was the day before the electrical cable fall).

At an impromptu meeting (5 days after seeing Lilia unable to bend down after two consecutive weeks where she could) I asked her if she thought improvements were being made since undertaking the SYT programme. Her response was “not really”. I reminded her that our bodies change and respond differently each day. Lilia appeared to accept this and even seemed to relax more in the next class.

July 2007 Final assessment

Lilia had returned from a week’s holiday in the UK to find a stressful situation at work. As a consequence she wasn’t relaxed but wanted to stick to the scheduled appointment. I asked her to focus on her breathing in order to relax her before starting the examination.

The psoas and adductors were stronger than the initial intake. ROM for hamstrings and gluteus maximus was also consistently better. A number of the other readings not focused on for this research appeared adversely affected as more shaking present on right side. Also some new findings with movements previously considered acceptable. She had a fall 10 days before which may have been the reason for some anomalies picked up for the hips and knees. These have not been addressed as a result of this as she was going to consult her cranial sacral therapist.

It appears that the exercises have had a positive effect for consistency of strength and movement. However there is clearly a link between state of mind and muscle strength and ROM.

Range of Motion Assessments

Joint Action	ROM	March 2007	March 2007	May 2007	May 2007	July 2007	July 2007
	Norm°	Left	Right	Left	Right	Left	Right
KNEE							
Flexion (Supine)	150°	130	130			130	130
Flexion (PRONE)	150°	70	50			70	50

HIP							
Flexion (Bent Knee)	135°	125	120	135	130	125	130
Flexion (Straight-Leg Raise)	90°	60	55	85	90	85	90
Extension	15	15	5			20	20

These added due to anomalies after final tests

External rotation (supine)	45	45	45			25	55
Internal rotation (supine)	35	30	30			35	40
Abduction	45	30	45			30	50
Adduction	30	30	40			15	40
External rotation (prone)	45	30	32			25	40
Internal rotation (prone)	35	45	50			40	45

Muscle Testing Assessments

Joint Action	April 2007	April 2007	May 2007	May 2007	July 2007	July 2007
	Left, 1-5	Right, 1-5	Left	Right	Left	Right
KNEE						
Extension	2-3	2-3 (jerky)	2-3	2-3	2	2
Flexion	1-2	1-2	2-3	1-2	2	2
HIP						
Hip Flexors & Abs (Supine)	0	0			0	0
Trunk Flexion (Supine)	4	4			4	4
Hip Flexors - Bent Knee (Supine)	3	3			3	3
Hip Extensors – Gluteus Maximus/Hamstrings	3	3			3	3
Iliopsoas Isolation (Supine)	2 with shaking	1 with shaking	3	3	3-4	3-4
Adduction (Side Lying)	2	1			3	2
Gluteus Maximus Isolation (Prone)	0	0			0	0

Bold = prioritise

c – Summary of findings –

Weak Muscles	Tight Muscles
Hamstrings	Hamstrings*
Quadriceps	Quadriceps
Hip flexors with abdominas rectus, psoas, rectus femoris, adductors	Gluteus maximus*
Hip adductors	Erector spinae **
Gluteus maximus	

* these appeared tight at first test as shaking set in after reading. However this may have been more to do with weak hip flexors. As the further two tests showed normal ROM, these may have only required release.

** as denoted by appearance of lordosis – no ROM test

SI limited. Significant vata imbalance (from anxiety, neurological illness, weakness (indicated by shaking) and stiffness.

d – Recommendations for loss of tone and flexibility

Build strength in psoas and stretch and strengthen hip extensors (gluteus maximus). Gain confidence in these exercises.

The SYT programme was developed around a gentle vata pacifying routine. This began with pacifying pranayama and relaxation techniques as well as working the muscles where needed.

Daily

1. Relaxation and Wave breath to stabilise vata. (¹SYT Mukunda Stiles p53)
Lie down and totally relax. Practice wave breath deep to the lowest abdominals. Place hands on the abdomen; thumbs touching across the naval, forefingers pointing down and touching and palms down hands flat (yoni-mudra) (from SYT training course). When totally relaxed and comfortable move to second exercise.
2. Practice pelvic tilt and thrust exercise (¹SYT Mukunda Stiles p166) 6 – 10 times (strengthen lower abdominals and psoas on thrust, also free pelvic and isolate lumbar).
3. From pelvic thrust start to lift the hips using buttock muscles and backs of legs (from SYT training course). Lift up to the point just before any shaking starts, release and then come down. (About 3 inches). Repeat 6-10 times (Strengthen glutes, hamstrings, stretch psoas and quads).
4. Pull the knees into the chest and practice apanasana. (¹SYT Mukunda Stiles p218) (strengthen hip flexors, stretch glutes).
5. Practice three hip strengthening exercises (²Anatomy of Movement –Exercises by Blandine Calais Germain P171). These resemble some of the muscle testing exercises given in Mukunda Stile's SYT manual, the detail of these exercises are given in Appendix 1.
6. Practice beginners hamstring stretch (³Runners Yoga Book by Jean Couch p82). The detail of this exercise is given in Appendix 1:
7. Relax completely as in 1.

Weekly

Practice Joint Freeing Series (¹SYT Mukunda Stiles p121). Do JFS # 5 and 8 from standing position. Emphasis on JFS #6 spine flexion.

Also first practice sitting position for SI correction as defined in SYT manual (hip elevated). This is to build up to complete correction exercise – as current flexibility is limited.

e – Results of your recommendations

Lilia showed discipline by carrying out the daily recommendations each day. She decided not to practice the weekly recommendations, feeling that the daily recommendations were enough to be going on with, which I agreed to.

As a result of the three month programme the psoas and hamstrings became stronger. Both ROM and muscle strength appeared to be affected by the level of relaxation and state of mind.

The fall 10 days before the final test showed a number of anomalies around the hip area which Lilia was going to discuss with her cranial sacral therapist. These have not been commented on within this paper.

2 a – Name and description of the condition

Stiff Man Syndrome ^{4,5}

The term 'Stiff Man Syndrome' was defined by Moersch and Woltmann and described as a neurologic clinical entity in 1956.

It is a rare neurological disorder with features of an autoimmune disease. Stiff Man Syndrome is characterized by fluctuating muscle rigidity in the trunk and limbs and a heightened sensitivity to stimuli such as noise, touch, and emotional distress, which can set off muscle spasms. Abnormal postures, often hunched over and stiffened, are characteristic of the condition. It is frequently

associated with other autoimmune diseases such as diabetes, thyroiditis, vitiligo, and pernicious anemia.

Scientists don't yet understand what causes stiff man syndrome, but research indicates that it is the result of an autoimmune response gone awry in the brain and spinal cord. The disorder is often misdiagnosed as Parkinson's disease, multiple sclerosis, fibromyalgia, psychosomatic illness, or anxiety and phobia. A definitive diagnosis can be made with a blood test that measures the level of glutamic acid decarboxylase (GAD) antibodies in the blood although these are associated with a wide range of human disease, including diabetes mellitus and seizures.

Possibly the closest related disease is tetanus because both conditions affect peripheral inhibition via central mechanisms and both conditions inhibit central gamma-aminobutyric acid (GABA) systems.

Because some muscle spasms usually persist, rehabilitation is important to further improve function when it is centered on the treatment of low-back pain and hyperlordosis, mobility problems, gait abnormalities, and muscular stiffness.

Lumbar Lordosis ^{6,7,8,9} (other definitions: lumbar curve, lumbar spinal angle, lumbar angle)

Lordosis is an increased curvature of the normally anterior curved lumbar spine. Three natural curves are present in a healthy spine. The neck, or the cervical spine, curves slightly inward. The mid back, or the thoracic spine, is curved outward. The low back, or the lumbar spine, curves inward again. The neutral alignment is important as the curves work as shock absorbers, distributing the stress that occurs during movement. Maintaining a neutral spine position helps safe movement during activities like sitting, walking, and lifting. The natural curves of the spine are the result of the muscles, ligaments, and tendons that attach to the vertebrae of the spine. Without these supporting structures, the spine would collapse. They support the spine - much like guide wires support the mast of a ship. This guide wire system is made up mainly of the abdominal and back muscles. The abdominal muscles provide support by attaching to the ribs, pelvis, and indirectly, the lumbar spine. The muscles of the back are arranged in layers (deep layer, the intermediate layer, and the superficial layer), with each layer playing an important role in balancing the spine. By using these muscles together, we are able to balance the spine.

Normal curvature of the spine is at the neck, the torso and the lower back area resulting in alignment of the head over the pelvis naturally. When the spine curves too far inward, the condition is called lordosis or swayback. When the curve exceeds the usual range, it may be due to musculoskeletal disease or simple poor posture. Normal range is 20-60 degrees.

The angle increases with anterior pelvic tilt and decreases with posterior pelvic tilt. These tilts usually arise from alterations in hip angle (anterior due to bilateral hip flexion and posterior due to bilateral hip extension). The lumbar curve will also alter in angle relative to structural alteration in thoracic curve i.e. congenitally exaggerated thoracic curves often lead to exaggerated lumbar and cervical curves.

The lumbar angle can be measured on x-ray and range of motion can be tested using an inclinometer or computer digitations. The use of inclinometers for spinal measurements is becoming standard and is a reliable, inexpensive and efficient technique.

More information on lordosis and it's treatment is given in appendix 3

3. Slight Stoop and Flat Back

4. Round Shoulders and Sway Back

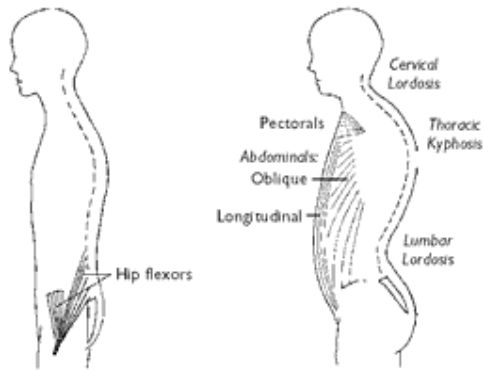


Figure 3. Patterns and Postural Muscles Involved

Figure demonstrating Lordosis¹⁴

b – Gross and subtle body common symptoms

Stiff Man Syndrome⁵:

Early stages

- Stiff Man Syndrome usually begins in the axial muscles
- the patient has an exaggerated upright posture and may report back discomfort or stiffness or pain in the entire back, which is worse with tension or stress. (flat back¹ - tight middle trapezius, abdominis rectus; weak erectors, psoas and hip flexors)
- patients may report disturbed sleep because, although the stiffness is relieved with sleep, when the patient transitions from rapid eye movement (REM) to stage 1 or 2 sleep they may lose the relief from the spasms, which may awaken them (pranamaya kosha)
- in some patients in the early stages, brief episodes of rather dramatic severe worsening that resolve spontaneously within hours or days may occur. Unfortunately, because of the subtle findings and apparent strong psychological components in the early stages, the patients are labeled as psychogenic, and effective treatment is often delayed (manomaya kosha).

Later stages

- proximal limb muscles also begin to be involved, particularly when the patient is stimulated, surprised, angered, upset, or frightened (manomaya kosha). This sort of stimulus may evoke painful severe spasms in the proximal arm and leg muscles that resolve slowly. The patient begins to move very slowly because rapid movement induces severe spasms. Even the distal extremities may become involved when moved rapidly
- exaggerated lumbar lordosis is present combined with contraction of abdominal muscles. (annamaya kosha - tight erectors, psoas, hip flexors; weak middle trapezius and abdominals)
- depression has been noted at this stage. The patient's quality of life is affected severely at this point, making it difficult or impossible to drive, work, or have a satisfying social life. (manomaya kosha)

End stages

- In the end stages of the disease, few muscles in the body are spared. However, facial and pharyngeal muscles may be affected markedly (annamaya kosha)
- Joint deformities may occur. Skeletal fractures and muscle ruptures may occur during spasms (annamaya kosha)
- Postsurgically, abdominal incisions are at risk of spontaneous rupture. Eating, simple movement, and other simple activities of daily living (ADLs) may be problematic. (annamaya kosha)

Lordosis⁸

Lordosis often causes no symptoms, but it may be associated with increased strain (annamaya kosha) on the lower back. This may cause low back pain (manomaya kosha).

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

Stiff Man Syndrome¹⁰

People with Stiff Man Syndrome can be too disabled to walk or move, or they are afraid to leave the house because street noises, such as the sound of a horn, can trigger spasms and falls. There is a risk of diabetes mellitus due to the GAD antibodies. There is a heightened sensitivity to stimuli such as noise, touch, and emotional distress, which can set off muscle spasms. Abnormal postures, often hunched over and stiffened, are characteristic of the condition.

Lordosis

The condition is almost always symptom and pain free¹¹. Occasionally, the person might have pain, especially if the curvature is severe. More frequently, the range of motion might be reduced with a significant curvature. In an email from Bart Goldman¹² he states “Severe lordosis may give nerve sheath shortening. If the client gains too much height too soon from lessening lordosis, radicular pain will be developed in the extremities”.

3 – Ayurvedic assessment and Ayurvedic based yoga recommendations for the condition

Stiff Man Syndrome

- Specifically to Lilia, her prakriti appears as vata kapha constitution – dry, fine hair, pale complexion; heavier frame, cold and sometimes damp to touch, muscle stiffness. My limited expertise of pulse reading of deep pulse gave vata kapha. Dampness is kapha – experienced during 2nd session. By third session this dampness had subsided. Cold feet (vata) observed during testing.
- Generally symptoms are multiple vkruti imbalances¹²
- All movement is vata and therefore stiffness is imbalance of vata and kapha (heaviness in muscles)
- Coolness of skin is vata
- Neurological – firing of nerves - pitta; impulses of nerves - vata¹³
- Autoimmune can be vata and/or pitta depending on the inflammatory aspect and also whether hormones affected have a heating vs cooling tendency (most hormones are heating, but not all).¹²
- Spasm - pitta
- Anxiety/depression - vata

Lordosis

From Bart Goldman¹² “One must go slowly as she probably has nerve sheath shortening and if she gains too much height too soon from lessening her lordosis, she will develop radicular pain in the extremities thereby increasing vata and pushing pita. The primary signifier of the lordosis is that her condition has evolved to imbalance all three doshas

Functional lordosis deformities are dynamic and therefore more vata>pita imbalanced. Fixed deformities are static and therefore more kapha than pitta imbalanced”

4 – Common body reading

Stiff Man Syndrome¹⁰

Abnormal postures, often hunched over and stiffened, are characteristic of the disorder. Affected muscles may become twisted and contracted, resulting in bone fractures in the most severe cases. People with this condition may have difficulty making sudden movements and may have a stiff-

legged, unsteady gait. Stiffness may increase and a hunched posture (kyphosis) or a swayback (lordosis) may be developed.

Lordosis

A person with a lordotic curvature will have exaggerated posture. Their buttocks will protrude more than usual. The lower back will dip inwards more than normal. Lordosis results in tight lumbar erectors, psoas, hip flexors, weak middle trapezius, rectus abdominis and possibly hamstrings.

A balance of strength and flexibility⁹ is the key to maintaining the neutral spine position. This balance is the basis for good muscle function. Muscle imbalances that affect the spine have many causes. One common cause of muscle imbalance is weak abdominal muscles, the muscles in the belly. As the abdominal muscles sag the hip flexors become tight, causing an increase in the curve of the low back.

From Bart Goldman¹² "The lordosis is a relative symptom signifying iliopsoas weakness, atrophy, and contraction along with paraspinal shortening and weakness. Typically more than 35 degrees is abnormal, but it must be evaluated in the context of hip flexion contracture and increased vs decreased thoracic kyphosis.

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

Stiff Man Syndrome

- Poses that make the client anxious – ie beyond their capability
- No adjustments unless they are comfortable with them to avoid startling them or causing anxiety.
- Poses that continue to shorten the lumbar erectors

Lordosis

The following is taken from Swami Bhaktipoornananda Saraswati of the Bihar School of Yoga 'Yoga and the Management of Back Pain (Part 2)'¹⁴:

- Sit ups: When the bones of the lumbar spine are habituated to a backward curve (lordosis), there is minute damage of the intervertebral ligaments. If we lie on the floor with the knees bent and bring the upper body off the floor taking the weight on the buttocks in a sudden way, the shearing force across the bones can be enough to increase the damage already done.
- Pawanmuktasana¹⁶ part 2 (straight leg raises – single legs, cycling and leg rotation) practices 1 to 3 will cause strain if the back is arched. The hip flexors (if already strong) pull the lumbar spine into more of an arch. Avoid double leg raising unless the back is flat and abdominal muscles are strong.
- Neck stretches: Avoid circling the head and dropping the head back to look at the ceiling (better to keep the teeth together to prevent over-extension).
- Halasana (plough pose) or sarvangasana (full shoulder stand) because of the pressure on the neck and lumbar spine.
- Forward bends that swing up if you have low back pain.
- Gatmatyak meru wakrasana (dynamic spinal twist) and trikonasana variation 4 (reverse triangle) twisting to the opposite foot and variation 2 with the arm stretched over the ear – if there is low back pain (too much leverage on the spine).
- Lying on the side and lifting both legs up.
- Shalabhasana (full locust pose) or star pose (with arms above the head).
- Dhanurasana (bow pose) can be done with knees remaining on the floor.
- Vyaghrasana (tiger pose or Mukunda Stiles 'sunbird pose') is OK if the leg being raised does not go past 15 degrees above the horizontal – the lumbar spine is stressed beyond this point especially when the movement is done too quickly
- Paschimottanasana (sitting forward bend) is not recommended to stretch hamstrings.
- Squatting and vajrasana (hero pose) to be avoided where knee problems exist.

6 – General recommendations for the condition

Stiff Man Syndrome

a – Therapeutic/free of pain

There are three levels to the condition as defined in Section 2b.

Once medically diagnosed (including x-ray to determine lordosis) the client should be assessed to determine ROM and muscle strength. To get the most effective tests, the client should be very relaxed before examination begins.

If at the first level of onset of the condition, Mukunda Stiles' Joint Freeing Series is recommended to maintain ROM and muscle strength. Also the use of vata reducing pranayama, wave breath and relaxation techniques are recommended.

If at the second stage of condition (as Lilia is) an appropriate gentle set of exercises to pacify vata and strengthen and stretch according to the imbalances. Determine level of stiffness and weaknesses and triggers of anxiety. In Lilia's case this was weak hip flexors (focus on psoas), tight erectors and tight and weak hamstrings and glutes. Check tightness of abdominals and instigate release if necessary. See the exercises recommended in section 1. Recommend daily vata balancing technique (yoni-mudra on lower abdomen), wave breath and visualisation for relaxation.

By the third stage they are likely to require even gentler set of exercises if movement is possible. At very least wave breathing, yoni mudra and visual relaxation.

b – Stabilize situation including lifestyle change recommendations

Maintain contact and give reassurance that everything is going well despite appearances. Due to the delicate nature of the neurological aspects of the condition both range of motion and strength are affected by their state of mind and therefore very different results are seen from day to day.

Convince them of the benefits to be gained by this investment in their condition by using Lilia as an example. After 7 years diagnosis her condition is not as bad as it once was and has not developed in the progressive way implied by medical papers and from anecdotal evidence of others. Some aerobic exercises such as swimming and trampoline exercise maintain fitness.

Optimise diet to reduce the likelihood of diabetes mellitus developing;

Seek alternative therapies to find the right one for the individual. Lilia has found herbalism, acupuncture and cranial sacral to be the optimal combination for her.

c – Maintenance and long term considerations

- Encourage regular use of JFS¹. Work up to doing Sacral Iliac (*SYT Training Manual*) stabilisation technique. Practise Wall Hang daily¹. Also JFS # 6¹ spine flexion with emphasis on lumbar movement and abdominal contraction, coming up with flat back rather than spine extension. To avoid confusion keep head down to really concentrate on bringing movement back to lumbar.
- Always seek to be empathetic and encouraging.
- If signs of depression refer to an appropriate counsellor to ensure emotions are not suppressed which may lead to other symptoms down the line.
- Look to develop a relaxation anchor – a technique that will instantly trigger relaxation if anxious.

Lordosis

From Bart Goldman¹² in email "Depending on how functional vs fixed these deformities are tells you how much lordotic correction the patient can tolerate. Functional deformities are dynamic, are impacted by ROM at neighboring joints and muscles, and can be corrected with counter measures such as SYT, PT, rolfing, etc. Fixed deformities are static and either congenital or so adhered so as to either not respond to SYT, PT, etc and/or require surgery, manipulation under anesthesia"

Most Lordotic curves do not cause any pain or symptoms¹¹. They do not need any special treatment. Sometimes, the lordotic curvature is severe. In this case, the patient might experience nerve compression, limited range of motion, or loss of spinal integrity. If the curvature is severe, then treatment is prescribed.

A programme for low back pain and lordosis taken from Swami Bhaktipoornananda Saraswati Yoga and the Management of Back Pain (Part 3)¹⁵ is given in detail in appendix 2.

The importance of physical exercise in management of back pain is given in appendix 3.

SYT can help with long-term muscle control and compliment clinical observation for detecting worsening signs and symptoms. Passive muscle relaxation techniques can be used to help to relieve symptoms of long-term muscle spasm and to avoid loss of range of motion.

7 – Questions and answers on Yoga Therapy from www.yogaforums.com

Myasthenia Gravis

Q I recently started working with a client who has myasthenia gravis. This man is 52 years, and although he has had the disease since a child, he is newly diagnosed for about one year. His wife accompanies him, and she is, understandably very anxious. He is being treated with prednisone and has consequently gained twenty pounds. He has a great deal of swelling, and the additional weight has eliminated any natural flexibility he may have had. He is hoping to regain some flexibility and movement through yoga.

I used the Autogenic training, with healing imagery to soothe and calm the immune system, with some reference to the transmission of acetylcholine at the **neuromuscular** junction. I also prescribed lavender essential oil for sleep problems. It works as an anti-inflammatory and calmateive. The client is open to the work. He already meditates, and has a strong religious affiliation. On the other hand, he is a high-powered attorney. Any suggestions for an orientation for practice for this type of autoimmune disease would be appreciated.

A lengthy question -- taking asparagus regularly can lessen need for prednisone, as it contains natural steroids. Optimal foods for his condition would be organic to lessen the tendency to react to hormones and so many other factors of diet that he will tend to be hypersensitive to. His condition needs to increase prana, which will balance the vata status of the condition he is facing.

For this pranayama is more important than Asana. Ideal is to teach simple wave motions of ujjaye as in my book. This should be accompanying all exercises he does. Pay more attention to getting him to have a fullness of breath than to doing the exercises just correctly. By getting more full body wave motion he will have more prana. Prana is the secret of all yogic healing not Asana (see Hatha Yoga Pradipika, chapter 5 on Ayurvedic perspective of Yoga Therapy which is only in Kaivalyadhama Institute edition, all other editions leave it out).

Meditation should be encouraged and increased especially with prayers custom designed that help him connect to Higher Power, as he understands God. This you can do only if you also are doing this. No yoga teacher can teach meditation or pranayama without a regular personal practice. It just won't take in students, as there is an energy transmission that occurs from one who is regular in their personal sadhana.

Joint Freeing series, as it is the right motions for him to do regularly. Ideal is not to do neck rolls, they are not part of my series. These can stress the neck and displace cervical vertebrae. Also I take note of your use of word "prescribe" around essential oils. It is best to avoid this word it is for licensed health professionals only not for yoga teachers or yoga therapists. Use word recommend, as our

work is more about lifestyle changes and not about substances that could be construed as medicines.

Hyperthyroid/swollen eyes

Q I have a hyperthyroid due to taking the drug interferon. I realize this is not supposed to be a true **autoimmune** disorder, but a temporary condition. It has been 1 1/2 years since I quit that drug and have been having some real problems for the past 6 months. My eyelids swell, and sometimes I cannot focus, or it is very difficult. I would like to wait this out a little longer, before having my thyroid nuked. Is there anything that yoga can do for the eye problem, or the thyroid in general? I suspect that my thyroid function is really fluctuating some, as I have gained 15 lbs in the past several months.

A Research on Yoga Therapy is sketchy but for details I would recommend you consult mail@yec.com and see what information the Yoga Research and Education Center has in their archives. One should definitely do the normal recommended yoga program for hyper and hypo thyroid conditions which is to prolong your shoulderstand until you can maintain it for 10 minutes. The counter pose should also be extended until it is 5 minutes. Normally this is fish but it can also be a gentle cobra or the lying twist Jathara Parivartanasana. I have a friend with this bulging eye symptom from her hyperthyroid condition and to my knowledge there is nothing natural that seems to make a difference. Although she says that what she is doing with affirmations and energetic work is making a difference in terms of the pressure in the eyes, there is no visible outward change from her friends point of view.

Iliopsoas

Q I am having a hard time understanding the action of the psoas and iliacus muscles. What are their actions, how do you test if they are strong or weak, how does weakness in these muscles manifest in terms of aches and pains and general function, and what yoga poses address issues involving these muscles.

In addition I would like to know whether boat pose is an effective abdominal strengthener or mainly a hip flexor exercise. And does boat pose excessively load the lower back.

A Functionally the iliacus and the psoas are both hip flexors, hence many anatomy books call these two muscles the iliopsoas. When you view these muscles in a detailed anatomy book you will see that the iliacus portion terminates at the anterior crest of the iliac bone. While the psoas origin is the body of T12 and the first 4 lumbar vertebrae, its insertion is the lesser trochanter of femur in the groin between the adductor. Thus its contraction creates hip flexion, external rotation and the natural lumbar curve and when excessively tight a lordosis. The latter condition is rare. Many teachers overly correct the lumbar curve and flatten it when they have students pull the coccyx down in standing poses, thus lessening the tone of the psoas.

To test for strength of the psoas lay down and lift one leg at a time 24" with 12" of abduction (out to the side) and externally rotate the femur until a valley can be felt at the upper thigh separating the gracilis tendon adjacent to the genitals and the quadriceps. One should be able to hold the position for 12 steady breaths to have adequate strength. Poses which require a strong psoas include adho mukha svanasana - down facing dog, navasana - boat; and urdhva prasarita padottanasana - upward extended legs. If the iliopsoas is weak these are difficult. A sign the muscle is strong is that the natural lumbar curve shape can be maintained in these poses.

A stretch test is to lay on the belly and pull the heel to the buttocks. This will stretch the quadriceps and if they have normal flexibility then the psoas will react as it is located posterior in the groin relative to the quadriceps. If the quadriceps are tight they will feel the stretch in mid thigh. If they are released and the psoas is tight, then the stretch will be felt as a pull in the lumbar vertebrae or upper groin. Poses that stretch the muscle are also quadricep stretches -- runner, natarajasana - dancer; ustrasana - camel.

The boat requires strength of the abdominals and the psoas in harmony. The rectus abdominis does trunk flexion (rounding the spine) and the psoas does hip and lumbar flexion (arching the low back

and lifting the legs). If they are equally toned the pose looks great. It is not excessive for the body. All poses chosen for my book are ones i consider natural range of motion regardless of one's age, sex, or health. When done well one can see optimal skeletal muscle tone. When not done well, body reading can reveal which specific muscles are weak and/or tight.

One helpful reference is The Psoas Book, Liz Koch, Guinea Pig Productions, Felton, Ca. www.guineapigpub.com My favorite anatomy atlas reference is Anatomy - A regional Atlas, Carmine Clemente, 4th edition, Williams & Wilkins. Also see my website www.yogatherapycenter.org for a more thorough recommended reading list

From Bart Goldman in response to questions about Stiff Man Syndrome ¹²:

1. This is a rare condition with multiple vkruti imbalances: the stiffness is primarily kapha, pain vata and autoimmune and spasm primarily pita. If she has been on or is on steroids or muscle relaxants, this can further flare pitta which then needs to be taken into account in SYT prescription. What is the patient's vkruti? The general rule of thumb with a nervous system and autoimmune disorder is to provide asanas that fatigue but do not exhaust, stabilize vata with applied pranayama and repetition and stay vini yoga warm ups and program in additional recovery and yoga nidra time. Dietary alignment is also paramount. Starting with Mukunda's wave breath with increased exhale duration, SI stabilization, modified JFS dandasana for IP strengthening and Palm Tree vinyasa variations all sound like a good way to go. Typical lumbar lordosis should be less than 35 degrees in the sagittal plane. Hope this helps!

2. I am not an immunologist, but the presence of Stiff Man, Hypothyroid, Myasthenia Gravis, and potential Diabetes mellitus do suggest a strong underlying multiple autoimmune syndrome. Autoimmune can be vata and/or pita depending on the inflammatory aspect and also whether hormones affected have a heating vs cooling tendency (most hormones are heating, but not all). At any rate, you have your hands full just controlling Vata which is the predominant presentation in this patient.

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9 Appendix

Appendix 1

Recommended Exercises in Addition to Structural Yoga Therapy Exercises (section d)

Exercise 5. Three hip strengthening exercises (²Anatomy of Movement –Exercises by Blandine Calais Germain P171).

(1) Lie on your back and raise both flexed knees above the abdomen. Place your hands on the outside of the knees and try to abduct the knees against the resistance of the hands (strengthen gluteus medius, tfl).

(2) As in position (1) place one fist between the knees and adduct the knees strongly against this (strengthen adductors).

(3) As in position (1) place the hands flat just above the knees. Flex the thighs against the resistance of the hands. Both iliacus and psoas are working. To work the psoas more, concentrate on pressing lumbar to the floor. (strengthen psoas).

Exercise 6. Practice beginners hamstring stretch (³Runners Yoga Book by Jean Couch p82).

(1) Lie on your back with both knees bent.

(2) Gently raise the right leg, knees still bent with the left foot firmly on the floor. Hold behind the right thigh with both hands.

(3) As you exhale progressively straighten the right leg as much as possible without lowering the knee, Bend the knee.

(4) Repeat 6- 10 times or hold and relax into back of leg. (stretch hamstrings).

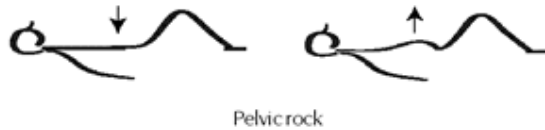
Appendix 2

Yoga and the Management of Back Pain (Part 2) Yoga Magazine September 2000¹⁵

Lumbar lordosis

Stretch hip flexors, adductors, lower erectors, back muscles (latissimus dorsi and quadratus lumborum). Strengthen hip flexors (sometimes), buttocks, abdominals:

1. Pelvic rock and clock: Lying on the back with the knees bent, the pelvis is tilted forward then backward so that the back alternately flattens and arches (see diagram). This is followed by movements where the pelvis is rolled so that pressure against the back of the pelvis moves in a complete circle – several times in each direction.



An alternative is jhulana lurhakanasana (rocking and rolling): Firstly rock from side to side, grasping the legs firmly to the chest. Then roll along the length of the spine, making sure to use a thick pad to protect the back from bruising.

2. Supta pawanmuktasana (leg lock pose)H: Bend alternate legs, with the emphasis on extending the leg that is 'resting' straight to bring a stronger stretch into the hip flexor muscles. Then bend both legs.

3. Once this is comfortable, shashankasana (moon or hare pose) is done in stages, mastering each stage before moving to the next: static, then bending forwards while breathing out and coming up again while breathing in, with:

- a) hands clasped behind the back
- b) hands held at shoulder level
- c) hands held at ear level, and
- d) hands held above the head.

The hands and arms are raised higher as strength increases.

Once the back is strong enough to do these practices, then more weight bearing forward bends are explored to gently stretch the shortened fibres around the discs. In the rag doll (pada hastasana) we stand and, gently curving the spine, use the hands to walk down the legs and back up again until confidence is gained. From the relaxed forward position, start by contracting the buttocks, tightening the pelvic floor and tucking the tailbone under. Then breathe in and use the breath and the stomach muscles as a girdle to roll the pelvis back. Straightening the lower back first, unfurl the back until vertical, raising the head last. This combination of breathing in and contracting the abdomen into a girdle (all around) increases the pressure in the abdomen, which in turn supports the spine, transferring the weight from the ligaments to the back muscles. This exercises the intrinsic (joint to joint) as well as the erector muscles, making them stronger. The pelvic floor contraction is especially important if you have had haemorrhoids – we want the pressure to move up not down!

4. Body curls¹ or naukasana (boat pose)⁴.

5. Kandharasana (shoulder pose).

Utthanpadasana (raised legs pose)², or chakra padasana (leg rotation)², or pada sanchalanasana (cycling)².

Side leg lifts: lifting the upper leg about 30 centimetres, and circling slowly.

Shroni chakra (hip rotation)², or ardha/poorna titali asana (half/full butterfly), holding for a count of 10 in the relaxed position.

6. Meru waktasana (spinal twist) H, or ardha matsyendrasana (half spinal twist)H.

Choose any side bending practice.

7. Ardha or poorna shalabhasana (half or full locust pose) H.

8. Shashankasana (moon or hare pose) – static for 3–5 minutes.

Other practices

A combination of practices is vital in the management of back pain. Pranayama techniques help pump lymph and remove toxins from the site of inflammation. They assist in the movement of the cerebro-spinal fluid that bathes the nervous system and keeps it healthy. The following practices should be learnt from a competent teacher.

Abdominal breath and full breath activate the abdominals and massage the spine from inside, especially when done lying prone as in *advasana*, *jyestikasana* and *makarasana*.

Pranayama that requires forced exhalation and *agnisar kriya* work many of the postural muscles especially the pectorals, back muscles (*latissimus dorsi* and *anterior serratus*) and the abdominals. *Agnisar kriya* also helps activate and clear the bowel.

The practice of *moola bandha* is useful in decreasing pain levels (see *Moola Bandha – the Master Key*, published by Bihar School of Yoga).

Yoga nidra works to release mental tensions as well as bring about a deep state of rest where healing can take place.

Antar mouna and *antar darshan* (see *Yoga Darshan*, published by Bihar School of Yoga) are practices to help with self-knowledge and acceptance.

Prana vidya (see *Prana Pranayama Pranavidya*, a Bihar Yoga Bharati publication) is used to direct prana for healing.

Constipation and impaction of the faeces are common with chronic back pain. The removal of all faecal matter often brings pain relief. Practice of *laghoo* or *poorna shankhaprakshalana* is important once the body is strong enough to do the asanas.

Appendix 3

Understanding the neutral spine ⁹

Management and prevention of back pain begin by understanding the neutral spine position. Three natural curves are present in a healthy spine. The neck, or the cervical spine, curves slightly inward. The mid back, or the thoracic spine, is curved outward. The low back, or the lumbar spine, curves inward again. The neutral alignment is important in helping to cushion the spine from too much stress and strain. Learning how to maintain a neutral spine position also helps you move safely during activities like sitting, walking, and lifting.

The natural curves of the spine are the result of the muscles, ligaments, and tendons that attach to the vertebrae of the spine. Without these supporting structures, the spine would collapse. They support the spine - much like guide wires support the mast of a ship. This guide wire system is made up mainly of the abdominal and back muscles. The abdominal muscles provide support by attaching to the ribs, pelvis, and indirectly, the lumbar spine. The muscles of the back are arranged in layers (deep layer, the intermediate layer, and the superficial layer), with each layer playing an important role in balancing the spine. By using these muscles together, we are able to balance the spine.

Controlling **pelvic tilt** is one way to begin helping to balance the spine. As certain muscles of the back and abdomen contract, the pelvis rotates. As the pelvis rotates forward, the curve of the low back increases. As the pelvis rotates backward, the curve of the low back straightens. Rotation of the pelvis is like a wheel centered at the hip joint. The muscles of the upper thighs also attach to the pelvis and contraction of these muscles can also be used to change the curve of the spine.

The abdominal muscles work alone, or with the hamstring muscles to produce a backward rotation of the pelvis. This causes the slight inward curve of the low back to straighten. If these muscles cause the curve of the low back to straighten too much, this may produce an unhealthy slouching posture.

In the other direction, as the hip flexors contract and back extensors contract, the pelvis is rotated forward -- increasing the curvature of the lower back. If this curve is increased too much another unhealthy posture may result. This condition is called lordosis in medical terminology, or swayback in common terms.

A balance of strength and flexibility is the key to maintaining the neutral spine position. This balance is the basis for good muscle function. Like an automobile or any other piece of machinery, an imbalance may lead to wear and tear, eventually damaging the parts of the machine.

Muscle imbalances that affect the spine have many causes. One common cause of muscle imbalance is weak abdominal muscles, the muscles in the belly. As the abdominal muscles sag the hip flexors become tight, causing an increase in the curve of the low back. Leading to the swayback posture mentioned above. Another common problem results from tight hamstring muscles. As the hamstring muscles become tight the pelvis is rotated backwards. This produces an abnormal slouching posture.

The Importance of Exercise

Exercise is important during all stages of recovery from a back injury. Different types of exercises will be used by your physical therapist as you progress. In the early stages, when your back is still quite painful, you may be taught specific exercises that are used to reduce your pain. These exercises are helpful in easing pain through relaxation. You also may be taught positioning exercises that will place the spine at a resting position. These exercises can give relief to sore muscles and joints.

Back pain can be physically and emotionally draining. Relaxation exercises may not correct your problem, but they can help control pain and its accompanying stress. Movement is also important, even when the back is still painful. Careful movements may be suggested by your therapist that can safely ease pain by providing nutrition and lubrication to injured areas. Movement of joints and muscles also signals the nervous system to block incoming pain.

As your back becomes less painful, the exercises will be changed to focus on improving the overall health of your back. These changes will focus on:

- flexibility
- strength
- coordination
- aerobic conditioning

Exercises that increase flexibility help by reducing pain and making it easier to keep the spine in the neutral position. Tight muscles can cause an imbalance in spinal movements. This can make the risk of injury to these structures more likely. Flexibility exercises for the trunk and lower limbs are helpful in establishing a pattern of safe movement. A slow progression of stretching exercises can increase the flexibility in the muscles and ligaments of the back and reduce the chance of re-injury.

The next stage of exercise focuses on the strength of the muscles that support the spine. These muscles help bring the spine into the neutral position - and keep it there. Well trained abdominal, back, and hip muscles can help hold the back in a neutral position almost forming a natural corset. Strength training is simple to do at home and doesn't require any expensive equipment.

Posture exercises help train the muscles in the right movements between the pelvis and low back. Learning how to find and hold the neutral position of the spine is the key for a safe and healthy posture. Remember that the position of the pelvis determines the curve in the low back. Forward rotation increases the curve. Backward rotation straightens the curve. By practicing these exercises, you will become more comfortable in using the neutral spine position in your daily activities.

Strong muscles need to be coordinated. As the strength of the spinal muscles increases, it becomes important to train those muscles to work together.

Learning any physical activity takes practice. Muscles must be trained so that the physical activity is under control. Muscles trained to control safe movement of the spine reduce the chance of injury. You will be taught exercises that will help you train your back muscles to work together to protect the spine.

Finally, attention will be directed to increasing your overall fitness. Muscles can get the energy they need to work in one of two ways - by using oxygen to burn calories from the bloodstream or by burning sugars in the bloodstream quickly without using oxygen. By using oxygen as they work, muscles are better able to move continuously, rather than in spurts. The word aerobic means *with oxygen*. Fitness training, or aerobic training, conditions the muscles to become better able to obtain the nutrients and oxygen that they need from the blood. If muscles are more used to working in fits and spurts they are more likely to burn sugars without using oxygen. This is called *anaerobic metabolism*, and it doesn't work nearly as well as aerobic metabolism. As the muscles use up the nutrients and oxygen, they switch to anaerobic metabolism and chemical waste products are created that can cause pain in the muscles. Aerobic training increases the muscles ability to get rid of these waste products.

Exercise has other benefits as well. Exercise can cause chemicals called endorphins to be released into the blood. These chemical hormones act as natural pain relievers in reducing your pain. So, exercise can actually make you feel better and help control your pain through the body's natural pain medication! It will be important that you pick an aerobic activity you can enjoy and stick with it!

10 – Biography

Karen Burt is a yoga teacher trained to the level of Yoga Siromani, Acharya and Bhaskara through the Sivananda tradition as taught by the Sivandana Yoga Vedanta Centers. She has been a student of Mukunda Stiles since October 2005. She has practised yoga since 1993 and taught yoga since 1998 with a specialism in yoga for sports. Her published works include a column "Yoga for Cyclists" that ran for 26 issues over a two year period in Future Publishing's Cycling Plus magazine (issues 166 – 192).

Her initial training was as a mechanical engineer, graduating with a BEng (hons) from Oxford Brookes University in 1996 followed by 11 years experience in environmental consultancy.

For the last two years she has practised as a therapist in massage and reiki. Her qualifications include ITEC Holistic Massage and Reiki training to master level.