

# **Spondylolisthesis**

**Structural Yoga Therapy  
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## **Case Study**

### **1a. Initial Intake**

The client is a 48-year-old female, is 5' 2", weighs 148 lbs and was diagnosed with spondylolisthesis two and a half years ago. However, for the last twenty years she has been in seeing an osteopath for this condition. As a mortgage broker/ insurance agent, who sits in front of a computer at a desk working from home during the week, she states that after sitting for so many hours in front of a computer she begins to feel pressure in her lower back. The pain experienced in the lumbar area is a 5/10- 6/10, strong, forceful, and hard pain. It subsides when she is sitting or has ceased any physical activity. Then it rears up again very intensely with activity. She also has uterine fibroids and 10 days prior to menses the pain worsens to about an 8/10-10/10. Mayan uterine massage has helped to relieve the pain. The medication prescribed by the neuro-surgeon is celebrex 200mg, one every 12 hours, works well. Another medication prescribed for pain & inflammation is Naproxen 500mg to be taken twice a day, caused too much burning in her stomach and she had to stop taking it. Another form of pain relief has come from a massage therapist, who performed deep tissue massage (states the procedure is terribly painful) on the right psoas.

Along with being an activist volunteering for the Iraq war effort (her son is an army combat medic) and a long time vegetarian, she avoids tobacco and alcohol as well as any intoxicants including prescription drugs. She has never really had an exercise routine except for spontaneous walking and was limber and flexible at a younger age. She states she tends to not be disciplined when it comes to exercise routines. However, she wants to remain mobile and when asked about her activity level, she stated she hasn't been able to walk for extended periods of time like she used to and has gained a moderate amount of weight. She can't sit for long periods of time due to the pressure that builds up in her lower back, but likes to sit and roll her back on a large physical therapy ball stating that it feels good. Her activity level has declined over the last couple years and the back pain has worsened. Visits to the neuro-surgeon haven't been encouraging. He states that this condition is normal and that she has to learn to live with it. The physical therapist she has seen has given her a few exercises but says that some of them put her into pain and haven't been effective.

### **1b. Physical Assessment**

In the lower back area of L5, an indentation in the area presents itself inside the erector spinae muscles. The test for the sacroiliac joint revealed the left sacroiliac joint moved up, but the right sacroiliac joint didn't move. She stated a 5/10 sharp pain could be felt coming from the right joint and it also feels like the spinal column is disconnecting as the pain moves down the right side of the thigh. As she lifted her legs up and down one could clearly hear the lumbar vertebrae clicking and cracking (stating it doesn't feel good when this happens).

When I showed the muscle test for the lower spinal erectors (cobra), she said that she was unable to extend or do back bending due to the pain cause by the lumbar vertebrae shifting forward.

**Table 1a**

<b>Range of Motion</b>	<b>Norm</b>	<b>12/17 Left</b>	<b>12/17 Right</b>	<b>5/1 Left</b>	<b>5/1 Right</b>
<b>Knee</b>					
Flexion-supine	150	124	127	133	135
Flexion - prone	135-150	103	106	115	99
<b>Hip</b>					
Flexion-bent knee	135-150	120	115	115	112
Flexion-straight knee	90	80	74	60	65
External rotation	45-60	47	29	38	45
Internal rotation	35	11	13	16	19
Adduction-IT band	30-40	30	30	30	30
Abduction – side lying	45	45	45	45	45
External rotation - prone	45-60	23	23	26	32
Internal rotation - prone	35	35	25	25	32

<b>Shoulder</b>					
Extension-prone	50	50	50	50	50
Flexion-supine	180	180	181	180	180
External rotation	90	80	90	110	100
Internal rotation	80	82	80	80	76
Horizontal adduction	130	90	100	95	106
Horizontal abduction	40	20	29	20	30
<b>Neck</b>					
Flexion	45	46		38	
Extension	55	55		58	
Lateral flexion	45	20	25	28	25
Rotation	70	60	60	48	62

**Table 1b**

<b>Muscle Testing</b>	<b>12/17 Left</b>	<b>12/17 Right</b>	<b>5/1 Left</b>	<b>5/1 Right</b>
<b>Hip-supine</b>				
Flexors with abdominus rectus	0	0	0	0
Trunk Flexion	0	0	0	0
Hip Flexors	5	4	5	4
Psoas-isolation	5	3	5	3
Sartorius -isolation	4	4	5	3
External rotators-	3	3	3	5
Internal rotators-gluteus medius/TFL	5	3	4	5
Abductors	3	2	4	3
Adductors	5	5	5	4
<b>Spinal Erectors</b>				
Lower erector spinae	0	0	0	0
Upper erector spinae	0	0	0	0
Neck extension-sitting	5		5	
<b>Shoulder</b>				
Middle trapezuis-scalpula	5	5	5	5

<b>adduction</b>				
Extensors-latissimus, teres major, triceps	5	5	5	5
Abductors- posterior deltoid, middle trapezius	4	4	4	5
Adductors- ant deltoid, pectoralis, biceps	5	5	5	5
External rotators-posterior deltoid, infraspinatus	5	5	4	5
Internal rotators-latissimus, teres major	4	4	3	4
Flexors-deltoid, pectoralis, biceps	4	4	4	4
Latissimus Isolation	5	4	4	4
<b>Neck</b>				
Flexion- sternocleidomastoid	3		4	
Lateral flexion-SCM/upper trapezius	5	5	5	3
Rotation-SCM/upper trapezius	5	5	3	3
<b>Lumbar Spine</b>				
Quadratus Lumborum	5	5	5	5

### 1c-Summary of Findings

<b>Muscles to Strengthen</b>	<b>Muscles to Stretch</b>
Sternocleidomastoid	Sternocleidomastoid
Lower & middle trapezius	Lower & middle trapezius
External hip rotators	Hip flexors
Right internal hip rotators-gluteus medius, abductors	Hamstrings-right side
Left psoas	External hip rotators

### 1d. Recommendations

The recommendations begin with strengthening the right sacroiliac in prone position. This involves lying on the abdomen with support (folded blanket) and moving the right leg slowly from side to side, inhaling and exhaling comfortably gently through the nose focusing on building strength in this area which will help the pain to gradually subside.

The pranayamas (known as balanced breathings) shown were the wave breath, inhaling from the chest down to the ribs and abdomen, exhaling from the abdomen to the chest. I explained that when doing the wave breath, a slight pause on exhale (known as kumbaka) assists with pain relief. The wave breath is to be done in conjunction with the joint freeing series. Agni Sardhuti, is a pranayama designed to assist in bringing agni or fire home to the belly (she does have a weight problem). She stated she could feel it in L5, but with no pain. Bastrika performed with the three bandhas: Jalandhara bandha, known as chin lock, with the chin brought forward down to the neck; Uddiyana bandha, the abdomen is pulled in at the naval; and Mula bandha, known as root lock, where the muscles are contracted from the perineum to the naval. Pranayamas are breaths that are consciously controlled designed to purify the subtle energy channels underlying the physical structure, but also vitalize and stimulate the whole system promoting the healing energy in the body.

Modifications of the joint freeing series intend to strengthen the upper body starting with the trapezius muscle and the lower body just below L5 on down. Strengthening these muscles will assist in reducing the pain accompanied by muscular weakness and lack of joint mobility. Another method of dealing with pain is to strengthen the muscle immediately below the site of pain or injury<sup>1</sup>. This provides a grounding support into which the painful tissues can relax. Directly working on an injury can provide temporary relief but will end up aggravating the pain.

All of the postures in the joint freeing series were given except for these modifications. They are: 1) Knee flexion-extension- done either sitting or lying in bed to reduce the stress on the lower back, which strengthens the quadriceps and the hip flexors (psoas and rectus femoris) 2) Cat pose or spinal flexion and extension; when extending the spine is neutral and does not go into extension. 3) Sunbird- by stabilizing the spine in neutral position pulling in the abdominals and lifting the extended leg off the floor slightly isolating the gluteus maximus helps to strengthen the gluteus maximus and the psoas. 4) Hip adduction-abduction contraindicated (unable to arch the lower back). 5) The pelvic tilt and thrust in supine position with very small movements to stretch the lower back and strengthen the abdominal muscles, the deep muscles of the lower back and the

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<sup>1</sup> Stiles, Mukunda, Structural Yoga Therapy, Adapting to the Individual. p.295

pelvic floor Spinal rotation is also contraindicated because of the arching of the lower back (due to pain that is created).

Cobra using both arms to gently lift the upper back strengthens the erector spinae, triceps, lower & middle trapezius elongates the spine and doesn't compress the L5 and S1 vertebrae. It can be done on the floor or standing facing the wall. Energy freeing pose given designed to bring apana prana (one of the five sub-doshas of Vata) designed to assist with excretion of body fluids -urine, feces, flatus, and menstrual fluids. When apana is balanced these functions are regular and without discomfort.

Yoni mudra, a seated forward bend after the poses (assists in retaining prana) for a few breaths. And last shavasana, lying on the back with the placement of the hands in an inverted triangle over the pelvic region breathing comfortably.

### **1e. Results of Recommendations**

Upon reassessment the scoliometer reading of Rachael's lower back showed at the most a deviation of two degrees or less. The initial reading showed a deviation of 5 degrees to the left. The sacroiliac exam showed a slight deviation from the right sacroiliac joint and not as much clicking in the L5-S1 vertebrae.

The pain in the right hip is bone pain, which tends to increase around menses (the 10 day period prior). Her osteopath says it is probably hormonal and there isn't a lot she can do about it. She is however, having less spasms in her back but is taking the stronger pain medication, Naproxen. I suggested because it is a non-steroidal anti-inflammatory, which tends to be hard on the stomach that she ask her osteopath for a different medication such as tramadol, which is a non-narcotic painkiller.

### **2a. Name and Description of Condition**

Spondylolisthesis is a partial forward dislocation of one vertebra over the one below it, most commonly the fifth lumbar vertebrae over the first sacral vertebrae<sup>2</sup>. In some cases, this may lead to spinal cord or nerve root compression. This can cause lower back pain, numbness or weakness in your legs. It can also eventually lead to losing control over your bladder or bowels. The muscles in the legs may feel tight, weak or limp. The causes can be from defected vertebrae at birth or damaged from an accident or trauma or a stress fracture of vertebrae caused from overuse or damaged by infection or arthritis. The client thinks her condition was caused from being kicked in the lower back as a result of domestic violence twenty years ago and was also hit by a car thirty-two years ago when

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<sup>2</sup> Mosby's Medical, Nursing, & Allied Health Dictionary. Mosby p. 1470.

eight months pregnant.

## **2b. Gross and Subtle body common symptoms**

- Back or buttock pain
- Pain that runs from the lower back down one or both legs<sup>3</sup>
- Numbness or weakness in one or both legs
- Difficulty walking and sitting
- Loss of bladder or bowel control
- Sometimes no symptoms at all

## **2c. Related challenges**

The client states she has gained a significant amount of weight from not being able to do the aerobic walking and exercise that she was once able to do. It simply puts too much stress on her back. She also works from home sitting for long hours in front of a computer, which tends to put stress on her lower back. Sitting on a large soft ball tends to feel good on her back because of the cushioning of the ball gives a soft massage to the back muscles. The feeling of contentment brought on by this activity accesses the third body or manomaya kosha known, as the “body sheath made of thought, which is an illusion”<sup>4</sup> is part of the multi-dimensional body from the yogic point of view. This is the body of the mind and the nature of this body is thought. One can gain pleasure from this body or kosha when thoughts are uplifting. The mind plays a part in healing especially when thoughts are positive enabling a beneficial response to take place within ones physiology.

## **3. Ayurvedic Assessment**

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<sup>3</sup> WebMD: Health Topics. 1995-2006. <<http://webmd.com/hw/arthritis/tp23256.asp>

<sup>4</sup> Stiles, Mukunda. Structural Yoga Therapy, Adapting to the Individual. p,44



Ayurveda is currently the oldest system of medicine in the world dating back to 4500 b.c. The definition of Ayurveda is the science of life and has impacted the medicinal systems of Greece, Indonesia, China, and Persia. Ayurveda treats the living entity individually- body, mind, and spirit as opposed to a generalized treatment.

There are three different body types-vata, pitta, and kapha. Every human body is composed of these three forces, known as the doshas. Basically they are waste products and act as supporters of the organism only as long as they perform their functions while moving out of the body. When they accumulate, physical substances increase with which they are associated and this leads to disequilibrium and disease <sup>5</sup>. The doshas are composed of finer elements: ether and air make up vata; fire and water, make up pitta, water and earth make up kapha. When balanced by a correct lifestyle, one experiences good health on the level of body, mind and spirit. If imbalanced, one experiences disease due to an unhealthy lifestyle caused by bad habits. What can also be a good treatment for one body type may not be a good treatment for another body type since everyone has a different combination of the three forces, vata, pitta, and kapha.

One of the doshas that can easily go out of balance is vata, which can cause early signs of disease and is considered “king” of the doshas. When out of balance vata affects pitta and kapha. Vata can also mimic pitta and kapha (however, vata is usually the culprit- more than half of all disorders are vata origin). When vata is balanced, the other two doshas will fall right into balance (similar to a domino effect). Balancing vata is important for everyone.

Vata controls movement of the muscles, central nervous system, breathing, the movement of food from the digestive tract. When imbalanced, pain arises along with spasms, anxiety, worry, depression and other nervous disorders. Rachael states the pain in the lumbar-sacral region is from an old injury related to damaged nerves. There is also a specific sub-dosha of vata in the lower back and abdomen called apana vata when out of balance can cause muscle weakness and pain <sup>6</sup>. Other symptoms she has include menstrual discomfort, muscle spasms with pelvic fibroids. What ayurvedic therapy does is to calm the agitated dosha, restore the balance and return the dosha to its home site (vata- the colon, pitta- the small intestine, kapha- the stomach). When the balance is restored, the body then heals itself.

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<sup>5</sup> Svoboda, Robert. Lessons & Lectures on Ayurveda. p. 12

<sup>6</sup> Chopra, Deepak. Perfect Health, the Complete Mind Body Guide. P.79

How does one balance vata with yoga therapy? Deliberate slow, dynamic movements are emphasized with great concentration, extension of the joints, making space and using extended soft muscular effort. An emphasis of slow gentle breathing or pranayama (an ayurvedic respiratory exercise) increases the healing energy in the body. Asanas (yoga postures) performed rhythmically at a slow breath pace with more emphasis upon the breath encourage the balancing of the vata dosha. When vata is balanced one will feel relaxation.

To balance pitta, stretch should be emphasized in poses- not the burn, but warm and not over stimulated (Rachael states forward bends feel good to her lower back). A creative sequence of asanas stimulates one to feel alert but not so much as to become hot. When the pitta dosha is balanced one will feel fire in the belly. Static poses (that are held) are for building strength, endurance and increase kapha. When the kapha dosha is balanced, one feels a warm loving heart.

#### **4. Common body reading**

In looking at Rachael's body from the front the first thing that is noticeable is the left shoulder is slightly higher than the right, which is a common deviation. Sternocleidomastoid and upper trapezius is tight. There is a lumbar curve at L5-S1, when measured with a scoliometer is off 5 degrees-assessment. The major muscle involved is the psoas, which is constricted. This muscle runs from the groin internally through the pelvis to the anterior lumbar spinal column. Also present were knock-knees. The adductors will tend to be tight and the hip abductors (gluteus medius and tensor fascia lata) weakened.

#### **5. Contraindicated Yoga Practices and General Activities to Modify or Eliminate**

The client states that backbends or any activity that arches the lower back such as downward facing dog, bridge, spinal twists, cobra, locust, and camel pushes the L5-S1 too far into the lower back causing intense pain. Activities such as cleaning around the house and prolonged sitting periods tend to stress the lower back and perhaps can be done for short periods of time.

#### **6. General recommendations for the condition-**

- a) Therapeutic/free of pain:
  - 1) Utilize the wave breath and the mind focused on relaxing the L5 and S1 with yoni mudra to bring the doshas to their home.

- 2) Try natural pain remedies (see appendix), and refrain from using over the counter and prescription painkillers.
  - 3) Strengthening the muscles using the breath to initiate contraction and relaxation.
- b) Stabilize situation and lifestyle recommendations:
- 1) Consistently practice modified JFS 3-4 times a week.
  - 2) When working in front of a computer try sitting in a therapeutic chair to take pressure off of the lower back.
  - 3) Use agni sardhuti to balance and maintain weight three times a day before meals.
- c) Maintenance and long term considerations:
- 1) Meditation to relax the mind.
  - 2) Stability in daily schedule with timing and consistency in activities (meals and exercise routine).
  - 3) Massage, warm baths, deep-water aerobics.

## 7. Questions and Answers from [www.yogaforums.com](http://www.yogaforums.com)

Restorative Yoga-for lower back pain

### **Question-**

Good afternoon, I was directed to your forum for an issue I'm having.

My lower back muscles have all gone into spasm. Radiating from my spine outwards to my hips and buttocks. This happens less regularly now that I've started yoga, but I have been wary of going to class to do a full practice until all the pinching and dull ache calms down. Is there a passive pose I can do at home that would help with the lower back pain? I have a herniated disc from when I was a teenager (12 years ago) and old muscle injuries on the top of that down my left side after taking a fall 3 years ago. Pain mainly presents more on the left side even though during my practice I am generally tighter on my right side. I also find my right leg comes up a bit shorter, however, I've been advised by physio's that this is due to my hips being slightly misaligned. I've been doing my spinal twists, knees to chest and child's pose, but would like to do something that I can relax into for 10-15 minutes. I've only been practicing for 5 months, and am very much a beginner.

Thank you in advance for you time.

### **Answer-**

Since I will be teaching in London next month; optimal is come see me for an individual session there or coming to the class for as many days as you can. [www.thelifecentre.com](http://www.thelifecentre.com) is my sponsor. If you cannot do that then get my book Structural Yoga Therapy and do the first half of the joint freeing series which will both bring tone and suppleness to your back. In my experience, leg length differences are due to muscle weakness not pelvic imbalances. Namaste, Mukunda.

### **Question-**

I have a client who is suffering low back pain and down the legs as well as reduced mobility due to spondylolysis and spondylolisthesis. He has suffered from it for over a year and cannot say precisely what brought it on although he feels strongly that negative energy is a key factor. He has trouble lifting his legs, walks with a shuffling gait, and has great trouble with stairs. He tries to limit the muscle relaxants and anti-inflammatory meds but they are the only treatment that gives relief. He has tried physio but did not find it helpful. He is in his forties and not physically active.

The MRI report is as follows:

The L1-L2 and L2-L3 disc spaces are normal.

At L3-L4 the disc is normal. The neural foramina are patent bilaterally. The spinal canal is patent. There are some hypertrophic degenerative changes of the facet joints and ligamentum flavum at this level.

At L4-L5 the disc is normal. The neural foramina are patent bilaterally. The spinal canal is patent. There are hypertrophic degenerative changes of the facet joints and ligamentum flavum.

At L5-S1 there are degenerative and plate changes and a grade I anterolisthesis of L5 on S1. There is loss of disc space height. There is a diffuse disc bulge associated with the anterolisthesis. This results in mild narrowing of the neural foramina bilaterally. The spinal canal remains widely patent. Although it is not well seen on these images, there appears to be a bilateral pars defect of L5.

Impression- there is a spondylolysis with a grade I spondylolisthesis of L5 on S1. This results in narrowing of the neural foramina bilaterally. The spinal canal remains patent.

I think I understand that this fundamentally a mechanical problem: the bilateral pars defect of L5. ([www.back.com](http://www.back.com) <http://www.back.com/> was very helpful in deciphering the MRI findings). My inclination is to recommend hamstring stretches and gentle core strengthening to start. I am unsure how to proceed

considering the disk bulge and pars defects. Any advice and insight into this condition, that you are able to offer, would be much appreciated. Namaste, M.

### **Answer-**

First let us define what are spondylolysis and spondylolisthesis. The former, according to Taber's Cyclopedic Medical dictionary, is a general term meaning a "breaking down of the vertebrae structure" and the latter is "any forward slipping of one vertebrae on the one below it. Predisposing factors include the previous, degeneration and birth defects such as spinal bifida". Thanks for the details medical assessment accompanying your summary of this client. You say he is not physically active. That is a major hurdle to overcome. He needs to be given a program that he will do one that will motivate him to attempt to overcome with self effort the pain and limited range of motion that he is blessed with learning from. In general I start this type of client with simple recommendations for exercising and lifestyle changes that will support lessening his stress. That would focus on joint freeing series to increase circulation, increase water intake, and regulation of sleeping, resting, eating habits especially getting to bed on time. If he will not do this then I would refer him back to physical therapy or other modalities that will take care of him. Having the initiative to work on himself cannot be a burden for a yoga therapist otherwise you are a yoga teacher trying to do physical therapy. A major distinction for me is that a yoga therapist should focus on clients doing yoga sadhana to improve his entire lifestyle not merely exercise therapy. Let us leave that to the PT and OT world.

That said my experience of these conditions is that they respond well to a combination of deep tissue bodywork and personalized yoga routine based on an assessment of what is weak with yoga to strengthen the specific muscles and an assessment of limited range of motion so that program will also focus on increase joint range of motion (not stretching muscles; as that intention will heighten inflammation due to increasing pitta). Rarely are the hamstrings tight enough to cause limited range of motion except in this type of chronic condition. But still I find more relief not from stretching what yoga teachers find tight, better is to strengthen what is weak. In this combination of skills I have counseled a client to 11 years of relative comfort, that is, when he followed my advice. I should admit that he didn't always do that and when he did what he knew wasn't good, he got into pain. It is a condition of management, not elimination of the difficulty. Blessings.

## **8. References**

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## **9. Appendix**

Natural remedies for pain:

Magnetic pads- apply to low back and leave on until pain free<sup>7</sup>.

Comfrey pack- boil the dried herb, apply directly over painful area.

Homeopathic remedies- Arnica 30c, Calcarea carbonica 30c, Calcarea phosporica 30c, Symphytum 30c. Take as directed on package.

Swimming is one of the best exercises for back pain. It relieves the pull of ones body weight. It can increase the strength of your back muscles without straining the back itself. One can easily practice stretches while in the water especially if one is in significant pain. Since aerobic activity is limited (walking, cycling,), I suggested deepwater aerobic exercise. She can put on a foam buoyancy belt (basic "Aqua Jogger") and "jog" in deep water which will reduce the pressure and impact

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<sup>7</sup> McLanahan, Sandra & David. Surgery and its Alternatives, How to Make the Right Choices for Your Health. P. 627

off her spine. This will also give her the aerobic exercise that she needs for her heart and keep off the weight that she has put on.

A final suggestion for her was to visualize in her mind how the postures were assisting in her ability to heal on it's own<sup>8</sup>.

### **Biography-**

Kathryn Lancaster is currently a registered nurse in Denver, Colorado and works with rehab patients. She started doing yoga at age fifteen after watching Richard Hittleman on PBS television. She met Mukunda Stiles in 2001 and has been doing on yoga therapy since.

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<sup>8</sup> Heriza, Nirmala .Dr Yoga. p. 202