A Pilates Programme for the Client with Systemic Lupus Erythematosus

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Systemic Lupus Erythematosus (SLE) is an auto-immune disease in which the body's immune system mistakenly attacks healthy tissue. The causes of SLE are not fully known and there is no cure, but the symptoms can be managed. It is more common in women than men.

SLE can affect the brain and nervous system, digestive tract, heart, lungs and kidneys leading to kidney failure and subsequent kidney transplant.

The symptoms of SLE are arthritis-like joint pain and swelling, chest pain when taking a deep breath, fatigue, fever (with no other cause), malaise, hair loss, mouth sores, being sensitive to sunlight, skin rashes and swollen lymph nodes.

The most common complaints of SLE sufferers are extreme fatigue with muscle and joint pain. This can lead to exercise avoidance and eventual muscle weakness and atrophy to such an extent that the person can become too weak to engage in everyday activities.
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Anatomical Description of Key Postural Muscles

Anatomical Description of the Spinal Extensors

![Diagram of spinal extensors](image)

**Seven layers of muscles of the posterior cervical and upper thoracic spine:**
1. Semispinalis Capitis
   (head extension & rotation)
2. Iliocostalis Cervicis
   (extends cervical vertebrae)
3. Longissimus Cervicis
   (extends cervical vertebrae)
4. Longissimus Capitis
   (head rotation & extension)
5. Longissimus Thoracis
   (extends & sidebends vertebral column)
6. Iliocostalis Thoracis
   (extends & sidebends vertebral column)
7. Semispinalis Thoracis
   (extends & rotates vertebral column)
The spinal extensors are divided into the erector spinae, semispinalis and the deep posterior spinal group. The erector spinae is the strongest and consists of columns of muscle - the spinalis, longissimus and iliocostalis muscles.

Deep to the erector spinae muscle runs the semispinalis muscle. This muscle rises from the thoracic spine. Strengthening this muscle can combat a slumped upper back posture.

The deep posterior spinal group - interspinalis, intertransversalis, rotators and multifidus is parallel in function to the transversus abdominis muscle. Their primary role is stabilization of the spine and small movements of one vertebra relative to adjacent vertebra.

The multifidus is a muscle vital for stabilization and rehabilitation of the spine because it spans more vertebrae and is stronger than the other muscles in the deep posterior spinal group because of its attachments.

Contraction of the erector spinae, semispinalis and deep posterior spinal group produces spinal extension.

Contraction of one side (except for interspinalis) can produce lateral flexion to the same side, and contraction of one side of the erector spinae (except for spinalis) can also produce rotation to the opposite side.
Contraction of one side of the semispinalis and some of the deep posterior spinal group (rotatores and multifidus) can produce rotation to the opposite side.

ii Anatomical Description of the Quadratus Lumborum

The quadratus lumborum is a deep muscle of the lower back. It arises from the borders of the transvers processes of the lower three or four lumbar vertebrae, inserts into the lower margin of the last rib and connects the pelvis to the spine.

The quadratus lumborum performs lateral flexion of the vertebral column, extension of the lumbar vertebral column, fixes the twelfth vertebrae during forced expiration and elevates the ilium.
The quadratus lumborum is a common source of lower back pain. When the lower erector spinae are weak or inhibited, the quadratus lumborum is overused, resulting in muscle fatigue. Continuous activation of the quadratus lumborum can lead to decreased blood flow, the formation of adhesions in the fascia and muscle, and eventual muscle spasm.

When the hip adductors are tight, the antagonist muscle, the gluteus medius may experience reciprocal inhibition.

Anatomical Description of the Hip Flexor Muscles

The hip flexors are the iliacus, iliopectos, rectus femoris and sartorius muscles. They are responsible for flexion of the hip.
The iliacus attaches to the iliac crest. The iliopsoas is attached to the lesser trochanter of the femur on the inside of the upper leg, and it attaches to the vertebrae of the lumbar spine at L1-5 and at T12 in the lower back.

The iliopsoas is the strongest hip flexor. The iliopsoas's primary function is hip flexion. Its attachments to the spine play an important role in maintaining the normal curvature of the spine and assists in lateral flexion of the lumbar spine. It is a key muscle for great posture and length in the back. Without adequate length in the psoas the spine will be hunched and there will not be adequate movement in the hips and legs. A shortened psoas will tilt the pelvis in an anterior direction. The hamstrings will become stretched. This causes hyperlordosis in the lumbar spine which affects the alignment of the entire spine, causing a forward head posture and pain between the shoulder blades. In this postural pattern the abdominals are often pushed forward and weak.

The causes of a short psoas is usually either sitting for long periods of time or over exercising without stretching properly. Proper abdominal strength is very important for a balanced psoas; weak back extensor muscles contribute to the problem.
III Case Study

The client is Linda, the author’s sister. She is a 39 year old female, married, and who has 2 sons aged 7 and 4. She works full time. Her work involves management, giving presentations, and driving. Linda was diagnosed with SLE when she was aged 23. Linda has had prolonged periods of illness due to SLE.

SLE caused hyperthyroidism in Linda. Towards the end of 2013 large nodules were discovered in her thyroid gland. This necessitated radio iodine treatment to irradiate her thyroid. Linda now suffers from hypothyroidism due to the treatment and has to take thyroid hormone supplementation for life. Linda has recently been diagnosed with type 2 diabetes which she controls with diet.

Linda regularly suffers from extreme fatigue and joint and muscle pains. Since the radiation therapy for her thyroid she has felt more tired than ever and has developed generalized muscle weakness and a kyphotic posture due to prolonged inactivity and pain. She reports “feeling down” due to the lack of energy and continuous fatigue.

Linda struggles with lower back pain, regular neck pain, and headaches. Due to fatigue and weakness everything she does requires effort; as an example, she struggles with the family shopping and finds the shopping bags very heavy and difficult to carry.

Linda wants to gain strength and endurance to be able to carry out her daily activities
i  **Findings on Assessment**

During the assessment the client’s pelvis was tilted anterior. The client has very little strength in the upper body and the hip flexors are very tight. The gluteus muscles are weak. The client has a slight forward head posture.

ii  **Goals**

1. Reduce back pain by stretching the hip flexors
2. Strengthening the abdominals
3. Improve the forward head posture by strengthening the back extensor muscles
4. Help the client understand what correct posture looks and feels like
5. Increase strength and endurance
6. Decrease fatigue
7. Encourage the client to engage in exercise with a mindful attitude to reduce stress

**IV  Exercise Programme: Weeks 1 - 4**

1. Warm up: Fundamental warm up
   1.1. Roll down
   1.2. Pelvic curl using small ball between the knees as an assist
1.3. Spine Twist Supine on step barrel
1.4. Chest lift on step barrel
1.5. Chest lift with rotation on step barrel

2. Foot work on reformer using 2 red springs
   2.1. Parallel heels
   2.2. Parallel toes
   2.3. V position toes
   2.4. Open V heels
   2.5. Open V toes
   2.6. Calf raises
   2.7. Prances
   2.8. Single leg heel
   2.9. Single leg toes

3. Abdominals on reformer (using one red spring)
   3.1. Hundred prep

4. Hip work on reformer using one red and one blue spring
   4.1. Frog
   4.2. Circles down
   4.3. Circles up
   4.4. Openings
5. Stretches on reformer (using one red spring)
   5.1. Standing lunge

6. Arm work using Magic Circle (Standing Series)
   6.1. Arms bent
   6.2. Arms overhead
   6.3. Single arm side press
   6.4. Single arm Bicep

7. Leg work - gluteals side lying series without weights
   7.1. Side leg lift
   7.2. Forward and lift
   7.3. Forward with drops
   7.4. Adductor squeeze with magic circle

8. Lateral flexion/rotation using Wunda Chair
   8.1. Side stretch (one spring top loaded)

9. Back extension using Wunda Chair
   9.1. Swan basic (one spring top loaded)
Discussion and Reasons for the Conditioning Programme

The first four weeks were extremely difficult for the client because of her generalized weakness and inability to isolate and recruit the correct muscle groups; as an example, it took three sessions to understand how to recruit the abdominal muscles for a chest lift without using the shoulders and neck.

Because of fatigue and to avoid a negative attitude towards exercise, during the first 3 weeks the client attended 2 sessions a week and then 3 sessions per week thereafter.

We focused on 5 repetitions of each exercise except for two repetitions of the stretches. The aim was to enforce correct posture and spinal articulation throughout.

Initially the client had to rest after 5 repetitions of each exercise in the gluteal side lying series.

To relieve some of the lower back pain caused by tight hip flexors and anterior pelvic tilt I incorporated the standing lunge and the gluteal series.

The client struggled to perform the back extension exercise and could only manage 3 or 4 repetitions during the first two sessions. An explanation was given about the role of the upper back muscles and how the weak upper back muscles contribute to her back pain and fatigue.
After the 3rd week of the programme the client reported that her back pain had lessened.

After week 4 my client was feeling better, but had only attended 9 sessions. Because of her weak muscles my client was still in the process of assimilating the fundamental level exercises. I decided to increase the intensity of her current programme, changing some elements and keeping some the same.

V Exercise Programme: Weeks 5 - 8

1. Fundamental warm up as in Weeks 1 – 4 but:
   1.1. Change: Chest lift on mat: Chest lift on step barrel
   1.2. Change: Chest lift with rotation on mat: Chest lift with rotation on step barrel

2. Footwork using reformer as in Week 1 - 4 but resistance increased to 3 red springs

3. Abdominal work using reformer (1 red spring)
   3.1. Hundred prep
   3.2. Additional: Hundreds
4. Hip work using reformer (two red springs)
   4.1. Extended frog
   4.2. Extended frog reverse

5. Stretches on ladder barrel
   5.1. Hip flexors
   5.2. Side overs prep

6. Arm work on Cadillac
   6.1. Extension
   6.2. Chest expansion
   6.3. Circles up
   6.4. Circles down
   6.5. Punches
   6.6. Biceps

7. Leg work on reformer (1 red and one blue)
   7.1. Single leg skating
   7.2. Hamstring curl

8. Lateral flexion/rotation on reformer (1 red spring)
   8.1. Mermaid
9. Back extension on reformer (1 red spring)

9.1. Breaststroke prep

i Discussion and Reasons for the Conditioning Programme

During weeks 5 - 8 we aimed to further strengthen the abdominal muscles and back extensor muscles.

My client initially had difficulties with the hundred on the reformer; therefore taught her the exercise lying on the reformer without any resistance. By week 6 she was able to do four breath cycles and by the end of week 8 consistently could perform 8 - 9 breath cycles with good form.

To address the tight hip flexors and lower back pain I incorporated a hip flexor stretch and the side over prep stretch on the ladder barrel.

To increase general muscle strength I increased the spring load of the footwork to 3 red springs and found that the client was executing the exercises with precision and flow within a week.
The arm series was added to the programme to add additional stretch and strength to the back and shoulder area as well as building strength in the arms to assist with the client’s daily activities.

By week 8 the client reported a marked improvement in back pain and feeling stronger, energized, more motivated, less depressed and without a feeling of wanting to avoid exercise.

**VI Conclusion**

People with SLE can benefit from range-of-motion exercises to keep joints flexible, endurance exercises to combat fatigue and strength exercises to increase and maintain muscle strength and stabilize joints.

The BASI Pilates program is useful for helping clients with SLE to strengthen their bodies in a balanced way, because it specifically recruits the appropriate muscles for strengthening and flexibility.

Clients with incurable diseases such as SLE live with chronic distress that places a tremendous drain on their ability to function physically, psychologically and emotionally. They must introduce mechanisms to prevent and cope with the symptoms of fatigue.
before it leads to a vicious cycle of progressive reduction in activity and exercise, and increased symptoms culminating in an inability to comfortably perform basic tasks of healthy living.

Exercising regularly on a BASI-pilates program, at an individualized level of intensity, can help sufferers of SLE to better cope with the symptoms of their illness on a physical, emotional and psychological level.
Books


Websites

"Lupus and exersize"


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"Hip Flexor muscles 3.32" [Https://aclandanatomy.com/abstract/4010411](http://aclandanatomy.com/abstract/4010411)

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Magazines

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