

# Imbalances of a dancer corrected through Pilates



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## **Introduction**

No matter your activity or your lifestyle, every person will experience certain imbalances in their body. Whether it's because of your job sitting at a desk the whole day, being a new mom or doing any kind of physical activities, these will influence on your muscle imbalances.

As a ballet dancer, I have been doing the same movements for most of my life.

Over the years, I repeatedly heard the same corrections about my posture, bellybutton in, shoulders down, relax your neck, more turn out, stretch your knees, stretch your back. Having a slight scoliosis and a tight lower back, I will show you how I have designed a Pilates program through the BASI Block System to fix these imbalances and work in a more balanced manner, which ultimately leads to injury prevention and less lower back pain.

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# Anatomy

The three areas of the body that I studied in my research were first an imbalance of the back during scoliosis, second tight lower back muscles causing tightness in the ribcage and third an imbalance between the right and the left legs external rotation.

Image 1

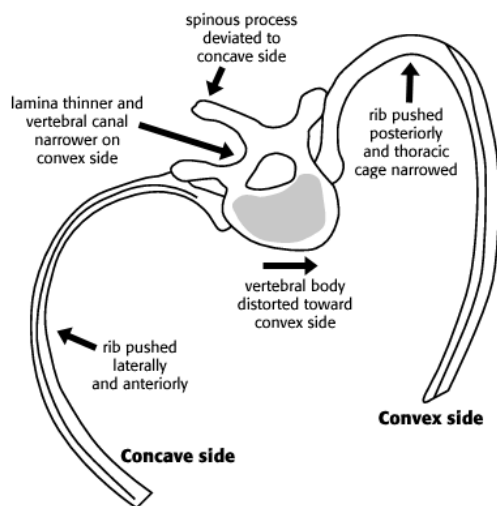
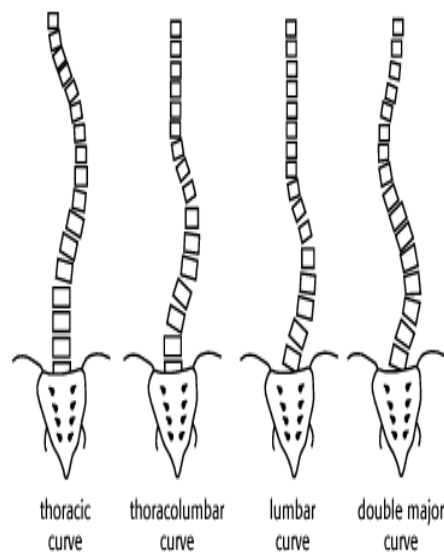


Image 2

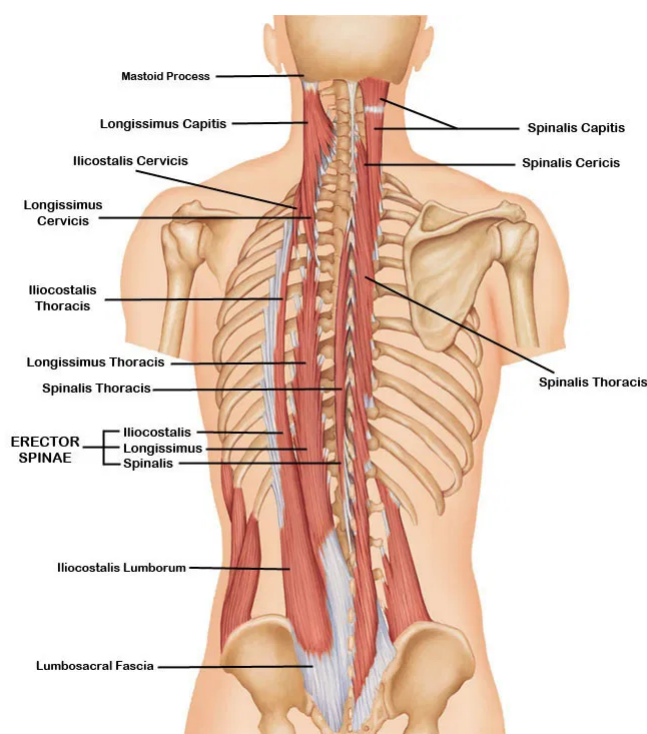


Scoliosis can be recognized by any noticeable lateral curvatures of the spine. It can be structural (born with it) or functional (from activities). For those that are born with scoliosis, the severity of their curvatures is measured in degrees in which the spine will be convex to either the left or the right side of the body (Image 1). Along with the spine forming lateral concave and convex there will also be rotation in the vertebrae. This vertebral rotation will cause the ribs to deviate towards the convex side. Image 2 is someone with scoliosis.

Due to a light scoliosis, I have tight back extensor muscles, which are the erector spinae that are comprised of the longissimus, iliocostalis and the spinalis (Image 3). These muscles are not only tight, but they are also more developed on one side.

To support movement of the spine, there are muscles that attach to different vertebrae to allow movement and protection of the spine. These muscles hold the spine in an upright position: extend and flex the spine and allow lateral flexion and rotation. Muscle imbalances are caused when a group of muscles are tighter than the opposing muscles. Usually if the back extensors are tight, it means that the spinal flexors are weaker.

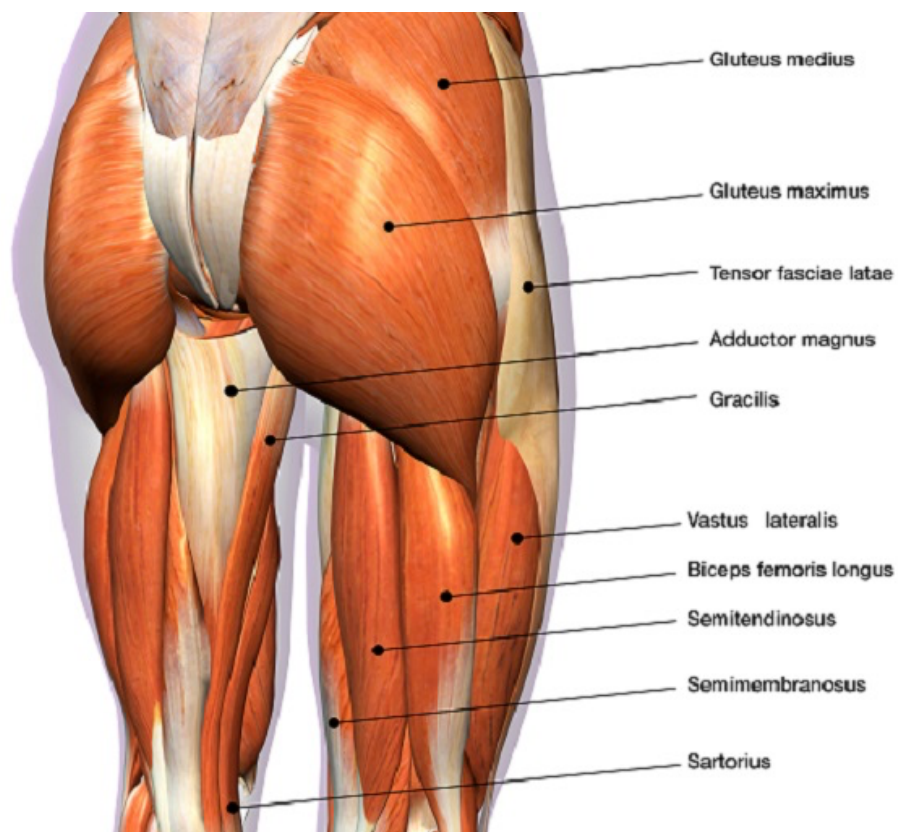
Image 3



At the hip joint, the movements are slightly different than the back. The hip is a triaxial, weight bearing joint, so it is less dependent on the muscles that support it. Abduction, adduction, external and internal rotation, flexion, extension, and a combination known as circumduction all occur at the hip joint. The hip is a very mobile, yet stable joint. Its main purpose is for gait and moving from a seated to an upright position. A normal range of motion in the hip joint would be anywhere from 20 to 30 degrees but some individuals have an even smaller range from 10-20 degrees. The main muscles that

support external rotation of the hip are the gluteus maximus, (Image 4) posterior gluteus medius, sartorius, the deep external rotators and the biceps femoris, which are shown in the diagram below. In dancers these external rotators are often extremely tight because all the work is done in external rotation, resulting in weaker internal rotators.

Image 4



## Case Study

Since my early childhood I have always been a very active person. I started ballet at the age of 8 and since then it has always been an important part of my life. I have never become a professional dancer, but I studied it seriously and invested many hours of hard work into my practice. I learned a lot throughout my studies. In ballet, teachers often use imagery, cues, and corrections to try to achieve a desired result from their students, much like Pilates. Without this information the student would not be able to achieve the correct movement. During my training, I have heard many corrections at the ballet studio to fix postural issues and imbalances. I initially turned to Pilates as a form of cross training to try and improve upon my weaknesses as a dancer and as a form of rehabilitation after an ankle injury. I have been practicing Pilates for almost 12 years now. Through my practice, I have learned to correct or improve upon these corrections and deviations that I can apply both in the studio and my everyday life.

Having back problems, my body has adapted in numerous ways to compensate for the curvatures. These deviations are noticeable when I do the roll down at the beginning of the class. On one side of my back, lateral to the curvature, the muscles are more developed because the spine twists and bends to that side, causing those muscles to work to try and balance the spine. When balancing in ballet class, I notice these deviations greatly. My hips laterally tilt, and I compensate by bending my spine in posterior or extended direction due to the lack of stability. Although most of my back extensor muscles are extremely tight due to the scoliosis, I also have great flexibility when my spine is in extension or even hyper-extension. My ribs splaying is

also a postural deviation that stems from these imbalances. I have very little range of motion in spinal flexion, but a very large range of motion when extending. Therefore, the most beneficial exercises I can do are those that involve spinal flexion and that work my back as equally and balanced as possible.

When working with someone with scoliosis in Pilates, it's important to evaluate the severity of the curvatures. While some curvatures may be visual, others may be difficult to detect at first due to the muscle development. I have found that I will have to focus on my right obliques and abdominals in spinal articulation exercises because otherwise my body will not work equally. It is also important to be cautious when adding rotation, because the vertebrae are already twisting, and one should only work in a range of motion that is challenging but does not cause pain. One of the most beneficial aspects of Pilates is the emphasis on the pelvic-lumbar stabilization. The work of a ballet dancer requires a great deal of extreme ranges of motion, so it was imperative for me to look at my placement, starting with the mat work. My first step was to work on the pelvic curl to find the correct muscle focus of the exercise and achieve more articulation in the lower spine. In the pelvic curl, I can feel which part of my spine wants to touch the mat first when rolling down. By aiming to touch both sides of my back to the mat at the same time, I stretch the muscles that might be tighter on one side and guide them to work in a more balanced manner.

Most dancers will encounter an imbalance between the degree of turnout from one leg to another. It is very common for a dancer to have one leg stronger than the other. For me, my right leg is the stronger and more aesthetically pleasing of the two, so whenever I practice a combination, it is usually using the right leg. My left leg became weaker and manifested imbalances. Tightness in the hip flexors and decreased balance of my left leg became evident.



When designing a program for myself, I focus on single leg work, such as the work done in the leg's springs on the Cadillac or the wunda chair. In single leg work, it is easy to differentiate the differences in strength, endurance, and imbalances in one side. Single leg work also prevents the stronger side from taking over. Ballet dancers must have an extreme range of motion in external rotation. The external rotators in my hip are extremely tight due to overuse. My left leg has less endurance and strength in the external rotators than the right. Working in parallel helps the overall health of my hip because those muscles are generally weaker.

# **BASI® Block Program**

## Warm up

- Roll down
- Pelvic curl
- Roll up
- Double leg stretch
- Single leg stretch
- Criss cross

I use an intermediate warm up to get a sufficient mat warm up before starting work on the apparatus.

## Footwork

### Wunda chair

- Parallel heels
- Parallel toes
- V-position toes
- Wide v-position heels
- Wide v-position toes
- Calf raises
- Single leg heels
- Single leg toes

There must be a co-contraction of the abdominals and back extensors. And keeping the pelvis in a neutral position is more challenging when doing the foot work.

## Abdominal work

### Wunda chair

- Standing pike
- Pike sitting
- Full pike

### Reformer

- Double leg
- Double leg oblique

When choosing exercises for my abdominal work, I focus on spinal flexion. By choosing the Pike exercises on the wunda chair, I can stretch the back extensors while working my abdominals.

On the reformer I chose the legs in straps series because it is a more challenging exercise, especially for me. It is also a progression from Double leg stretch that I did on the mat for my warm-up.

## Hip work

### Cadillac

#### *Supine single leg series*

Frog  
Circles (down, up)  
Hip extension  
Bicycle

I choose the Cadillac because it uses the leg springs. They enable the legs to work independently. Like most individuals, I have a stronger leg, and thus I am aiming for balance in the strength in both legs. Therefore, I choose the single leg series.

## Spinal articulation

### Cadillac

Monkey original  
Tower prep.  
Tower

I had to find exercises that would encourage stretching the erector spinae equally. I am focusing on stretching the back equally, even into the upper back.

## Stretches

### Reformer

Full lunge

### Ladder Barrel

Hamstings

I try to release or stretch my hamstrings during each session. From ballet I am most of the time in external rotation, so it is important that I stretch and strengthen the hip adductors to avoid further imbalances.

## Full body integration (Fundamental/Intermediate)

### Reformer

#### *Knee stretch group*

Scooter  
Round back  
Flat back  
Reverse knee stretch

### Cadillac

Thigh stretch with RUBar

These exercises allow me to focus on abdominal strength and spinal flexion while working the entire body. I choose the thigh stretch with the roll up bar due to my tight hip flexors, helping me work them in an eccentric manner.

### Arm work

Reformer

#### *Arm sitting series*

- Chest expansion
- Biceps
- Rhomboids
- Hug-a-tree
- Salute

Arm work is always a challenge for me because of the little amount of arm work that is incorporated in ballet. But I am progressing and doing more advanced exercises now. I like the sitting series because of the co-contraction of the abdominals and back extensors.

### Full body integration (Advanced/Master)

Reformer

- Balance control front
- Balance control back prep
- Balance control back

Although most of my focus throughout my session has been on trunk flexion, it is important to work the body in a balanced manner. I chose exercises that work on the trunk stabilization and a more neutral position of the spine.

### Leg work

Wunda chair

- Leg press standing
- Forward lunge
- Backward step down

Reformer

- Jumping series
  - Parallel
  - V-Position
  - Single leg parallel
  - Leg changes

Working the legs independently is very valuable. I choose to work in a parallel manner because those muscles are generally weaker. These exercises are all extremely challenging for me because they are not the muscles I am used to using in ballet. The

jumping series is a wonderful place to practice the fundamental mechanics of jumping.

### Lateral flexion/rotation

Reformer

Side over on box

Wunda chair

Side pike

Ladder barrel

Side over prep

Side over

With one side of my back tighter than the other, I try to do lateral exercise that make me work both sides equally. For example, when performing the side over on the box you do not come up past the diagonal line, so both sides of the body are working equally. It is also important to stretch the obliques which is why I incorporated the side over on the ladder barrel.

### Back extension

Ladder barrel

Swan prep

Swan

Cadillac

Prone 1

Prone 2

Hanging back

For these exercises I try to focus more on the upper back extensors. Hanging back on the Cadillac is a great way to articulate the spine to the back extension and to focus on not letting it come from the lumbar region.

### Roll down to conclude

If I have to fit the program into a regular session, I will use only 2 different apparatus. The above program is made up of exercises I try to incorporate as frequently into my work out as possible to improve and correct my imbalances.

## Conclusion

My workout became increasingly more balanced. I noticed an improvement in my spinal flexion and the balance between my left and my right leg. By working on the imbalances in my back, my ribs started splaying less for the stretching of the back extensors. Continuing to work on the imbalances will ultimately lead to injury prevention. Although my work in ballet often focuses on extremes, focusing on balance through Pilates has only made my workout stronger. When restoring balance to the body, it is important to start from the beginning. This can be hard for some people, but it has proven to be the best thing for my intense physical work.

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