PEAK PILATES®

An Introduction to Spiraldynamik® for Pilates Instructors

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Brief history of Spiraldynamik

We were introduced to Spiraldynamik over 15 years ago. At that time the courses were only being taught in German. In 2015 they offered the first English course taught in Zurich, Switzerland. And of course we were a part of it.

Spiraldynamik was developed by an international research team led by Dr. Christian Larsen, he and his research team went back into our evolution to understand how we developed our human locomotion. Spiraldynamik can be defined as an explanatory model to explain human anatomy and locomotion based on human evolution.

Just like Pilates, Spiraldynamik looks at the full movement potential in each of us and asks the question are we using our full potential and are we using it in the most effective and efficient way and if we are not, where is the issue and what can we do about it.

Spiraldynamik is a blueprint for the human body. It is not a technique like Pilates or Yoga, but a way to look at the body that can be used for any kind of movement or therapy modality. It is a manual for the body which allows us to analyze the movement of the body in a very specific and quick way.

Spiraldynamik is based on anatomical facts. Joseph Pilates did not know the anatomical facts we know today. Pilates based his method on his anatomical knowledge of his time, his experience, his observation of movement and his instinctual knowledge of movement. By blending the current anatomical knowledge from Spiraldynamik with Joseph Pilates's work we can create a universal and unbiased approach to the Pilates method and exercises that moves the method forward while staying true to the original

intent and spirit of the Pilates method, no matter what version of an exercise you are doing. It works.

For us, looking at Pilates through the lens of Spiraldynamik it allowed us to look at the exercises in a new way and “see” things we had not seen before in our clients and ourselves. We did not look at Pilates movements from a “choreographic” point of view as we were taught, but from functional point of view. In addition, it allowed us to give clearer and more precise cues.
The intent of both Pilates and Spiraldynamik is to improve health and create efficient and effective movement patterns. The goal of Pilates has always been what Pilates can do for you when you are not doing Pilates like when you are playing sports, playing with your children or when you are out shopping, etc. Both Pilates and Spiraldynamik want to find the most efficient way of movement for each individual.

Spiraldynamik “divides” the body into coordination and transmission units. Coordination units are parts of the body that are functionally linked together.
Transmission units are where force is transmitted from one functional unit to another.

Besides their function, the main difference between a coordination and transmission unit is that coordination units have poles and transmission units do not.
If the poles of a coordination unit are in the correct anatomical position the body in between the poles has the potential to move freely and efficiently.

Spiraldynamik divides the body into Coordination and Transmission units

12 + 1

Trunk:	Poles: head & Pelvis
2 Shoulders	Transmission unit
2 Arms	Poles: humeral head & arch of hand
2 Hands	Poles: metacarpal I & V
2 Pelvis	Transmission unit
2 Legs	Poles: femoral head & arch of forefoot
2 Feet	Poles: heel bone & arch of foot

Just like Pilates Spiraldynamik uses movement principles.
For today's workshop the most relevant principles we will look at are:

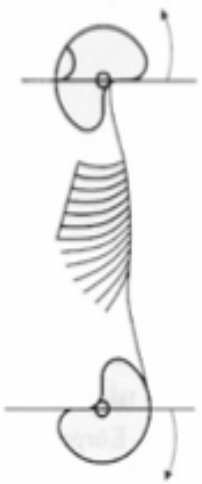
1. Poles principle
Spiraldynamik® divides the body into Coordination Units and Transition Units. Only Coordination Units have Poles.

When the poles are aligned in the anatomical correct position, the body volume in between is able to move freely and the Coordination Unit is centered. For example, the poles of the Coordination Unit of the trunk, the head and the pelvis, influence the movement of the body in between the poles, the spine.

2. Body Elongation principle
Body Elongation principle is similar to the Pilates principle of lengthening.

Muscles cannot push; they can only pull. Body elongation happens through rotation of the poles. The spine lengthens because the poles rotate away from each other.

- Elongation allows for an even distribution of force/tension
- The kinetic energy from the impulse to movement moves through the body and supports overall movement



In Spiraldynamik the spine is one of the coordination units in the body. Coordination units have poles and the poles of the coordination unit of the spine are the pelvis and the head. To create elongation in the spine the pelvis rotates backwards and down, and the head rotates forward and up.

3. Spiral principle

A spiral is not the same as a rotation. A rotation is around 1 axis, and a spiral is around 3 axes.

Axis of rotation:
Identify the axis on the Triadball

1. Transverse axis - right/left
2. Sagittal axis - front/back
3. Longitudinal axis - up/down

Identify the axis and rotation around the axis on:

1. Pelvis
2. Head

To create a 3D spiral; 2 rotate in opposition and 1 rotates in the same direction.
Example: Foam/noodle

Roll up - Joe

Starting position:

Lie down on your back with the legs straight and together with the feet flexed. Lift the arms back and overhead

Execution:

Inhale: Simultaneously lift the head and arms up
Exhale: roll up and forward and make 3 pulses
Inhale: roll back until the head is on the floor
Exhale: bring the arms back and overhead

Which Spiraldynamik principle can we find in this exercise?

- All the principles are there, spirals in the arms, legs and shoulders.
- The main principle we want to focus on is the: Body Elongation Principle

The body elongation principle will create the elongation in the spine for the spine to be flat on the floor.
The body elongation principle will allow flexion of the spine without compression in the spine

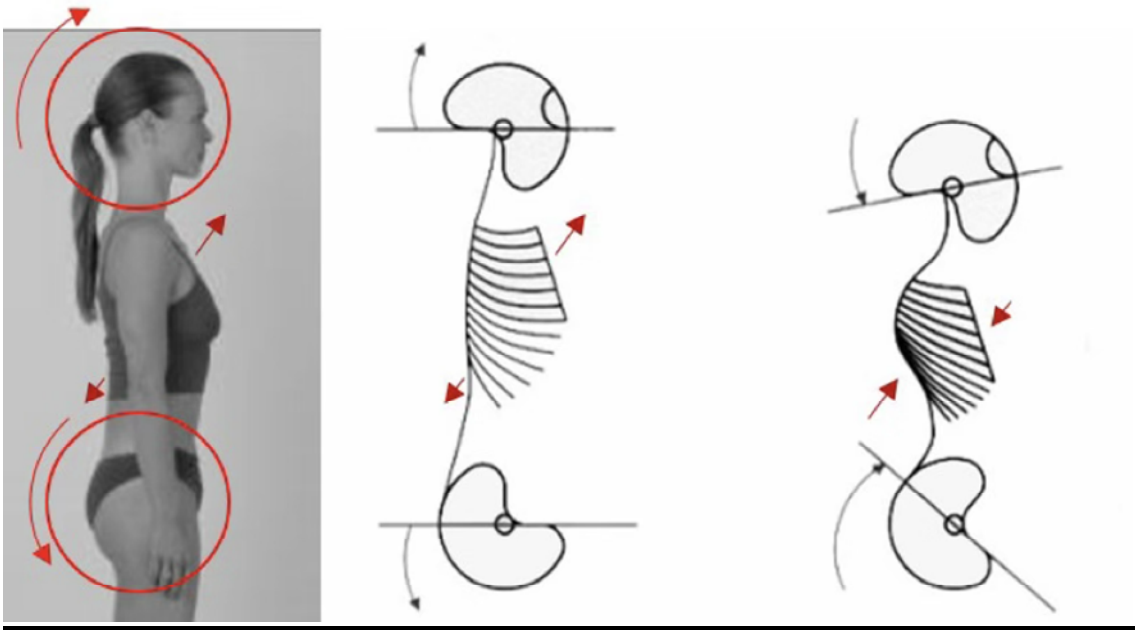
Muscles cannot not push points apart; they can only pull points towards each other. Therefore, the spine cannot be pushed down to the floor. We need to elongate the spine and as we elongate the spine the spine will move towards the floor.

- If we do this from the trunk and move the ribs towards the pelvis, it most likely will move the spine towards the floor but will create compression in the spine as it only presses the spine down.
- If we do this from the trunk and move the pelvis towards the ribs, it most likely will move the spine towards the floor, but it will create a pelvic tuck and will flex the lumbar spine and create compression in the lumbar spine

If we use the concept of the rotating the two poles of the trunk: the head and the pelvis rotating away from each other, we create length in the spine and pretension in the spine without compression.

Compression forces make things bend. The compression forces created by the collapse from the front in the sternum and the collapse in the spine in the back, make the spine bend, creating a kyphosis like bending of the thoracic spine.

When the two poles are in the correct position and rotation, it lengthens the entire spine while maintaining the curvatures of the spine and brings the structures under tension. This tension and elongation bring mobility, space and stability in the entire unit of the trunk and allows effective and efficient movement and distribution of force.



Head pole - ribcage connection
Stand with the legs hip width apart and make sure you stand in the middle of the feet.
Place one hand on the top of the sternum.
Keep the chest relaxed.
Slowly let the head move forward and let the chin move up (opposite to the correct rotation)
Feel how the top of the sternum collapses, back and down.

Pelvis pole - ribcage connection
Stand with the legs hip width apart and make sure you stand in the middle of the feet.
Place the back of one hand on your back, slightly lower than your shoulder blades (or as much as possible.
Make sure your weight is divided evenly on your feet.
Make sure your pelvis is fully upright.
Keep your weight on the middle of your feet as you slowly move the pelvis into an anterior tilt and feel what happens in the spine.
Feel how the back of the spine and ribs start to compress

Pelvis
The pelvis is the “bottom pole” of the coordination unit of the trunk.

In Spiraldynamik we talk about the “uprighting of the pelvis”. Although the uprighted pelvis is similar to a pelvis that is “neutral”, we use the word upright as the word “neutral” often gets interpreted as a passive position that feels “neutral” or “natural” to them. They “think” their pelvis is neutral if they just stand or lay down relaxed and the pelvis magically moves into place in their “neutral” position. Uprighting of the pelvis implies you actively have to do it.

The transverse axis of the pelvis runs through the center of the hip joints. Due to the distribution of the bone mass, the pelvis rotates backwards and downwards around the transverse axis. This creates a lengthening of the lumbar curvature and brings the lumbar structures under tension.

The pelvis, spine and neck are all designed to move in a three-dimensional way. Rotation, counter rotation and spirals are what they are designed for. When we look at the shape of the bones it becomes clear that three-dimensional rotation is what they are designed to do.

Some exercises to experience the action of elongation

Pelvis 8

Goals:

- Pelvis mobility
- Movement of the pelvis during gait

Starting position:

Lie on the back and place the ball underneath the coccyx. Legs are bent, hip width apart and both feet are on the floor. The arms are on the mat alongside the body.

Execution:

In order to be able to create elongation in the lumbar spine the pelvis needs to be in an upright position. Tightness of musculature around the pelvis can prevent the pelvis from moving into an upright position. Especially the hip flexors and adductors can be a factor.

Anterior hip release

- Releasing muscles and fascia that can prevent the backwards/downwards rotation of the pelvis pole

Goals:

- Releasing the musculature of the front of the hip

Starting position:

Lie down on your stomach and place the spiky ball on the right pelvis just below and inside of the ASIS.

Execution:

Hip flexor stretch

- Releasing muscles and fascia that can prevent the backwards/downwards rotation of the pelvis pole

Goals:

- Stretching of the hip flexors

Starting position:

Kneel on one leg. Keep the knee of the back leg under hip with the shin and foot parallel in line. (bringing the foot in; which turns the leg out, can be a sign of tight hip flexors). Release the pelvis (slight arch)

Execution:

Adductor stretch

- Releasing muscles and fascia that can prevent the backwards/downwards rotation of the pelvis pole
- The adductor muscles specifically Adductor longus, Adductor brevis, Pectinous and Gracilis attach on the pubic ramus. Tightness in these muscles also will prevent the uprighting of the pelvis pole

Goals:

- Stretching of the adductors

Starting position:

Kneel on the right knee. Make sure that the knee is directly under the hip. Place the left foot on the floor in front of the left hip with the knee and ankle in line. Externally rotate right leg 90 degrees. Both ASIS are pointing slightly rotating keeping the pelvis and lumbar spine elongated. Place both hands on the left thigh.

Execution:

Head
The head is the “top pole” of the coordination unit of the trunk.

The head’s center of gravity lies in front of the transverse axis of the atlas, creating a rotation that rotates the skull forward/downwards. Using the back of the head as a reference point, the back of the head rolls backwards and upwards (lift the back of your brains). This creates a lengthening of the cervical curvature and brings the structures under tension.

The spiral movement of the head is created in 2 different joints.
1. The upper head joint - Atlas (C1) and the occipital condyle
2. The lower head joint - Atlas (C1) and Axis (C2)

<u>The upper head joint</u>
The superior surface of the Atlas is shaped like 2 half pipes in snowboarding. One is angled front to back and one is angled side to side. This allows movement around the transverse axis (nodding yes) and movement around the sagittal axis (lifting one ear up).
Due to is shape when there is a slight gliding movement back when we nod yes. This makes the back of the head move back and up as the chin moves forward and down There is very little gliding when we move through the sagittal axis.

<u>The lower head joint</u>
This is where rotation around the longitudinal axis happens between C1 (Atlas) and C2 (Axis). The Atlas rotates around the dens of the Axis.

Between these two joints, all movements are possible.

When turning your head
- Rotation of the head around the transverse axis “forward”
- Rotation of the head around the sagittal axis “upward”
- Rotation of the head around the longitudinal axis “outward”

- Place your right hand on the right occipital bone

1. Slowly turn your head to the right and feel the movement of the three axes.

- Place your left hand in your right arm pit.

2. Keep looking straight forward as you rotate the ribcage to the left. Feel the same movement around the three axes when the head is “still”.

Exercises:

Head 8 on SB
Goals:
- Mobility of the cervical spine

Starting position:
Lie on the back and place the SB underneath the head/neck by the occipital ridge. The legs are bent, hip width apart and both feet are on the floor. The arms are on the mat alongside the body.

Execution:

Resisted uprighting of the head
Goals:
- Strengthening the deep throat muscles

Starting position:
Lie on your back with your legs bent and hip width apart. Place your hands into each other with only your thumbs “sticking out”. Tilt the head slightly backwards and place the thumbs under the chin (jaw)

Execution:

Lifting head off the floor
Goals:
- Strengthen the muscles involved in the figure 8 movement.

Starting position:
Lie on your back with the legs bent and hip width apart. The arms are relaxed next to the body

Execution:

When we do a Roll Up we move from elongation into flexion of the spine. Functional flexion of the spine is created by the two poles “rolling” towards each other. The spine reacts to these movements by rounding. This way we are able to create a long, spacious and even rounding of the entire spine.

A great way to experience this is by doing:

Cat stretch (focus on the flexion only)
Goals:
- Experience the poles moving during flexion

Starting position:
Quadruped

Execution:

Movement of the vertebrae
In the Roll Up, each vertebrae makes the same movement as the head. Each vertebrae moves, back, up and forward.

Show with TB:
Place your TB with the plug down. The plug represents your spinous process of the vertebrae.
Slowly roll the ball and observe the directions of movement of the plug.
It moves back, up and then forward.
Joseph Pilates says in his book to use the image of a wheel for the Roll Up. This is the same thing.

Roll up with TB
Goals:
- Elongation of the spine
- Rolling through the spine with the correct initiation of the head and pelvis pole

Starting position:
Lie on your back with the legs straight and in Pilates stance. Hold the TB in between the hands and lift the arms up and overhead.

Execution:

Saw

Starting position:

Sit with the legs as wide as comfortable, with the feet flexed and open the arms out to the sides.

Execution:

Find the Spiraldynamik principles in the saw
Body elongation
Scapula outward spiral
Pelvis outward spiral
Spiral of the spine

We will focus on the inward spiral of the trunk/spine and the outward spiral of the pelvis, creating a counter rotation in the spine

Rotation of the spine

When it comes to the capability to rotate, the vertebrae higher up the spine can rotate more than the ones at the bottom.

The vertebrae in the lumbar spine can only rotate about 2 degrees per joint; adding up to about 12 degrees in total.

The vertebrae in the thoracic spine, even though they are attached to the ribs, rotate more. Primarily because of the different shape and position of the facet joints compared to the facet joints of the lumbar spine.

The vertebrae of the cervical spine are specifically designed for mobility and create the most rotation.

Besides the differences in the shape of the vertebrae, the center of rotation is different between the lumbar and thoracic spine. The center of rotation in the lumbar spine is more posterior (back of the spine) and towards the facet joints. The center of rotation in the thoracic spine is in the body of the vertebrae.

The great thing about the spine is that all the vertebrae work together to create rotation. Rotation builds up from the base of the spine; one vertebra at a time. Think of it as walking up a spiral staircase, with each step you rotate a little more, so each vertebrae participates in the rotation.

Spiral torsion of the ribcage

The 3D mobility of the spinal column and thorax also allows for a harmonious spiral lengthening of the trunk. The ribs move in the vertebra-rib joints as well as in the rib-sternum joint and shift against each other. When walking the pelvis of the standing leg the pelvis moves down (outward spiral) and the ribcage of that side lifts and opens - the thorax on that side grows in length, width and depth. The other side the rib distance decreases.

When you rotate the right thorax forward it is as each rib moves slightly forward and upward from the one that is underneath it. The ribs that move forward move forward and up. On the left side (the side that moves backwards) the back ribs move back and up.

Exercises:

<u>Opening and closing the ribs</u>
Goals:
- Experiencing the opening and closing of the ribs

Starting position:
Sit in a tailors sit or in another comfortable position. Place your right thumb underneath your right armpit in the space in between your ribs.

Execution:

The ribs have bony connections in the back with the vertebrae and in the front with the sternum. Tightness in the joints can prevent the ribs from moving and the result is that they don't open and close which in turn limits spinal rotation.

<u>Sternum release</u>
Goals:
Release the connections between the sternum and the ribs

Starting position:
Lie down on your stomach and place the SB underneath the hard part of your sternum. Don't place it too high (manubrium) or too low (xiphoid process). Place the arms into a W position.

Execution:

Mimic the movement with hands

Goals:
- Experience the movement of the ribs

Starting position:
Sit with the legs in a comfortable position. With your thumbs and pointer finger create the shape of your ribs.

Execution:

Rib cage release - in teams
Goals:
- Experience the movement of the ribs

Starting position - in pairs:
Stand with the THB around the bottom part of the rib cage of the client. The teacher stands in front of the client and hold the ends of the THB. The hands of the teacher are slightly up so that the THB angles slightly up.

Execution:

To improve spine flexibility of a stiff or flat back spine you have to do rotation and flexion. Exercises like the Saw and Thread the needle are great.

Thread the needle with Triadball

Goals:
- Thoracic rotation

Starting position:
Kneel in a quadruped position with the legs hip width apart and the hands shoulder width apart with the fingers slightly turned in towards each other. Place the right forearm on the Triadball (under the sternum).

Execution:

Side lying hip outward spiral
Goals:
Experience the movement of the outward spiral

Starting position:
Lie on the side with the Theraband wrapped around the sits bones. Hold the ends of the Theraband with the top hand and anchor it onto the floor at about eye level. The hips and shoulders are on top of each other, with the legs bent at a 90-degree angle. Place the TRIADBALL™ between the knees. Extend the bottom arm out in line with the body and place the head on the arm, if needed use a pillow.

Execution:

In the Saw as in many Pilates exercises where rotation of the spine is involved, we are looking at a counter rotation.

In order for the pelvis to be still and stay anchored on the floor the body needs to create a counter rotation. The Pelvis moves into an outward spiral as the upper body moves into the movement of the Saw.

A great way to feel that is

Saw - with TB
Starting position:
Sit with the legs as wide as comfortable and hold the TB with both hands. Lift the arms up towards the ceiling.

Execution:

In the classical Pilates method, we don't have any exercises where there is counter rotation we can actually see. Mostly we keep the pelvis still and rotate the upper body or keep the upper body still as the hips rotate or lift. As we mentioned "keeping the pelvis still" is created by a counter rotation, we don't make the full counter movement.
This is not bad. It creates a lot of stability, and it is easier for the client. Creating and moving in a counter rotation is complicated. However, it is not the most functional way of moving. Therefore, whenever we can we create counter rotation in order for the client to get stronger, more coordinated and have a better functional carry over to their daily activities. One of the exercises we use frequently is:

Going up front
Goals:
- Experience counter rotation and mechanics of walking

Equipment set up:
Wunda chair
Springs: 1 top & 1 bottom

Starting position:
Press the pedal down with the right leg and step with the left leg on top of the chair. Allow the left pelvis to move into an inward spiral and counter rotate the upper body slightly. Have most of the body weight in the middle of the left foot

Execution: