

## REFORMING YOUR MAT – PAA WORKSHOP CUEING FOR DYNAMIC STABILISATION NOTES

I have been training in Dynamic Neuromuscular Stabilisation (DNS) during the last six years through the Prague School of Rehabilitation in the Czech Republic. DNS is based on the scientific principles of Developmental Kinesiology (DK), which describes the human movement system from birth. This includes the inborn, automatic programs that define our postural foundations and the movement skills associated with these programs at each specific age of physiological development throughout the first year of life.

DNS and DK explain that contrary to common 'core strength' approaches; *"Dynamic (core) stability is not achieved purely by strengthening the abdominals, spinal extensors, glutes, or any other musculature. Instead, core stabilisation is established through the central nervous system's precise coordination of these muscles and intra-abdominal pressure regulation."* Kolar

Stabilisation is achieved from the inside out, with correct physiological breathing creating the adequate distribution of intra-abdominal pressure (IAP) and the balanced co-activation of all the muscles of spinal stabilisation: the deep neck flexors, the diaphragm, pelvic floor, all abdominals, and the short inter-segmental spinal muscles.

Drawing on the principles of DK and DNS, my cues generally all focus on five goals – all aimed at improving dynamic stabilisation. They are; breathing, parallel alignment of ribcage and pelvis, intrinsic support, joint centration, and isolated joint movement. All of these goals are interdependent. I will briefly describe each here to help you make sense of my cues throughout the class.

### **Goal 1. Improve the breathing pattern in all movement**

Ideal breathing facilitates stabilisation. It is physiologically impossible to stabilise spine/extremities if breathing is not ideal. So this should be our first point of call! *'If breathing is not normalised – no other movement pattern can be.'* Karel Lewit *'Before any real benefit can be derived from physical exercises, one must first learn how to breathe properly.'* Joseph Pilates

### **So what is ideal or physiological breathing?**

Simply put, during inhalation, there is a downward movement of the diaphragm. The central tendon stays in a horizontal position as it descends, the lower ribs spread apart, and IAP increases in all directions. Physiologically, this movement of diaphragm is coupled with eccentric activity of the abdominal wall and pelvic floor and creates constant IAP. Developmentally, before any phasic movement happens,

this "automatic" feed-forward mechanism activates the baby's spinal stabilisers, ensuring ideal motor patterns, ideal muscle balance, and ideal structural development. Ideal breathing in adults affords us the same "feed-forward" stabilisation mechanism.

### **What does this imply for Pilates?**

Drawing in or hollowing can restrict the movement of the diaphragm and the eccentric activity of Abs and PF. When I watch my client move, I am looking to see if the D can move freely and if the IAP is equally distributed throughout the pelvic and thoracic cavities -the core cylinder. I look for hollow, sucked in or restricted areas in this cylinder, and I cue breathing 360 degrees around the trunk and pelvis.

### **Goal 2. Create a parallel relationship between ribcage and pelvis.**

Parallel alignment of ribcage and pelvis facilitates the physiological movement of the diaphragm necessary to maintain a functional connection between the diaphragm, abdominals, and pelvic floor. This does not mean that the spine has to stay rigidly neutral to be stable! Flexion, extension, rotation and lateral flexion of the spine are all normal physiological movements; however to enhance dynamic stability, we need to think of creating fluent spinal curves that encourage movement through all vertebrae and thus maintain the relationship of ribcage and pelvis as parallel as possible. For examples, watch the cues in the following exercises: footwork (neutral), rowing 4, stomach massage (flexion), pull straps, down stretch (extension), twist and reach in the short box and sm twist (rotation)

### **Goal 3. Establish good quality of support in all exercises and transitions.**

Support is the fixed point for the body's stabilisation, usually in contact with the ground, and in CKC. Developmentally, all uprighting of the spine and all movements arise from the support.

During development, the first support is on the spine in supine, and on the pubic bone and forearms in prone. As the baby begins to use the extremities purposefully, we see support on the forearms, shins, sitz bones, and eventually on the hands and feet. In Pilates, simply think of what part of the body is in contact with the floor in a CKC. Support can also be imaginary, for example, in a tennis serve, one arm is supporting in space (without contact with the ground), and the other is moving through space.

Correct support is a necessity for the balanced co-activation of all muscles involved in a movement, so it plays a crucial role in correct breathing, ideal alignment and spinal uprighting. All of these are interdependent.

Throughout the Reformer Mat, you will notice I cue support on four points of contact in the spine. The back of the skull, the 3rd/4th Thoracic vertebrae (the attachment or fixed point for the deep neck flexors), the thoracolumbar junction, and the middle of the sacrum. Good support at each of these points of contact is necessary for the stabilisation of the spine at every level. I continue to cue these points even when the spine is not in contact with the floor. The goal is to develop body awareness that allows the client to find dynamic alignment and thus stabilisation, when moving through space.

It is important to note here that good support on the extremities is just as important as good core support. The two are interdependent.

Poor support on the extremities immediately translates to the girdles, challenging alignment, and core function. For example, the quality of wrist/hand support is reflected in the function of the shoulder girdle. Support on the feet is reflected in the pelvic girdle. To create good quality of support in all joints, we need to cue and educate our clients in active joint centration – bringing me to my fourth goal - joint centration.

#### **Goal 4. Maintain joint centration**

Joint centration is where the joint is maintained in an ideal or neutral position throughout an entire range of movement. When the joint is in a neutral position, there is minimal tension on the capsule and ligaments, and there is a balanced co-activation of all surrounding muscles. There is maximum surface area contact between the joint surfaces, and forces applied across the joint are symmetrically distributed.

The foundation of a neutral joint position is established during motor development in the first year of life. In adulthood, many factors contribute to the gradual decentration of joints, including poor work/sports/life movement habits, disease, injury, etc.

The reformer mat is an ideal place to improve the centration and thus support of many joints, without the apparatus's distraction or assistance. E.g., without the bar in the long stretch sequence, we can improve support through arm/shoulder girdle with a focus on correct wrist/hand and elbow centration. In the front split, we can improve hip and pelvic girdle function by focusing on good support through the feet and ankles on the floor.

Remember that support will change during transitions, making it important to maintain quality of support into the next position. This requires good body awareness and neuromuscular control at all times in the workout.

**Goal 5. Improve isolated movement.**

We often see a lack of ability to isolate movement from certain segments/ joints, due to poor motor patterns and associated lack of mobility. For example, hip flexion/extension is often coupled with lumbar flexion/extension; shoulder flexion is often coupled with an elevation of the ribs and hyperextension at the T/L junction. Thoracic extension often becomes lumbar hyperextension etc.

Be aware of the purpose of an exercise and where the movement should begin from. For example: if the purpose of the exercise is to improve hip and knee function as in the knee stretch, we should be looking for the full range of hip flexion and extension, which requires a neutral position in the spine and pelvis.