

STABILISERS & MOBILISERS: Joseph Pilates was courageous against all odds especially as doctors denied that there were any differences between voluntary muscle types, but well after Joseph's death his theory was officially acknowledged. Unhindered by pre-conceived ideas Joseph studied every aspect of exercise starting with babies. Like Einstein, he made discoveries overlooked by professionals who assumed their text books were indisputable without any physical involvement or re-search themselves. The two muscle types are slow twitch high endurance local muscles (closest to skeletal frame) designed to hold or stabilise joints allowing fast twitch low endurance phasic mobilizers to move freely to FULL range of motion. Also the brain activates more muscle fibres for speed & power when the skeletal frame is stable & safe. Like a Ferris wheel, the axel must always be stronger than the limbs. Stabilisers, like the work horse are built to carry heavy loads & work long periods. Mobilisers, like the race horse are not built this way & can instantly run fast but then need to rest. Stabilisers take much longer to strengthen than fast twitch muscles but unlike mobilisers that shorten & bulk from over-use, stabilisers lengthen or flatten for a lean powerful body & joint stability. A baby instinctively strengthens the stabilisers first starting with the cervical spine followed by the rest of spine & while balancing in sitting position they engage the deep glutes. Crawling focuses on coordination, shoulder girdle stabilisers, multifidi spine & hip flexors like 4 point swimming & the legs are the last to strengthen. Sitting long periods at school & sent to run sends the wrong message to the brain so we need to re-train the body & neuro-pathways similar to a baby. Every muscle is important so initially they need to be isolated *without a shared workload* to either relax or strengthen so that ultimately all muscles can *share* the workload in the jobs they were designed for.

IMBALANCES: One can be as flexible or strong as you wish provided muscles are balanced & strong on the inside. Pilates is about injury prevention/rehabilitation - maintaining balance between muscle lengths & strengths but placing priority on stabilisers which are either engaged or lax. Whatever happened to the saying "ruler down the back & book on crown of head"! Joints should be in line & level; ears over shoulders with a direct plumb-line to tail bone. Jaw bone, collar bone, ribs, hips & pubic bone all in same plane. One size does not fit all, so each client should be assessed for imbalances in the first class & then only stretch the tight side then strengthen the weak or over-stretched side or just strengthen stabilisers if nothing is tight. Set up is imperative - especially shoulders down like a lid on the pressure cooker - down, back & out. For mobilisers, too much stretching weakens & too much toning tightens - either are prone to injury. If one mobilising muscle is tight then the next section may automatically tighten in order to stay upright so there is no point in continued stretching of those already stretched. ie: those with tight hamstrings may have excessive flexion of the spine while the other side has long quads & limited spinal extension, or the opposite in other clients. When we lose muscle strength we lose bone density so low muscle toned clients need to strengthen all muscles from inside out so unless there are tight areas - omit stretches & focus on strength. One doctor said "chin in - hips forward" which I thought was good simple advice seeing as many computer workers jut their chins forward & leave their butts behind them. The head is the heaviest block & if not level with ears over shoulders this stress causes the back of the neck to shorten leaving excess skin sag in the front of neck plus dowagers hump etc. Any misalignment feet to head causes compensational problems elsewhere. Focus on good alignment & posture against gravity is paramount in correcting imbalances to prevent injury, but changing the neuro-pathways is the first & hardest step so less is more at this stage.

TRANSFER THE STRESS: The brain is wired to use dominant muscles so we can only '*transfer*' the stress to the inner stabilising muscles designed to take the stress or strengthen the weaker muscles bearing in mind that all muscles need equal help from their synergists on the opposite side. A body cannot function safely when all muscles are weak so stretching alone results in dangerously lax ligaments & no joint support. The same can be said of too much toning as ligaments & tendons are stressed. Via visualisation techniques, the pre-motor cortex can re program the brain prior to physical involvement & *less is more* at this point to learn to isolate specific muscles without dominant muscles jumping in. Stabilisers are the body's greatest priority & when weak or bi-passed via the neuro pathways, *adjacent or opposing* mobilisers will be recruited as stabilisers & as they are NOT designed for this job they lose mobility & become stressed due to these unrealistic demands. Along with gluteus medius & piriformus etc, the posterior pelvic stabilizer/rotator *quadratus femoris* (under the butt) is *the key to your core*. When standing, this intrinsic muscle holds turn out for dancers, activates the inner thigh muscles, prevents anterior pelvic tilt, all leg alignment problems, gripping hip flexors & plantar. High impact sport can exasperate imbalances seeing as the brain always uses the tightest muscles. PNF stretches (tension/release) are the most effective method of releasing a resistant muscle & repeated over time, results are similar to Bowen Technique. Low muscle toned clients often **don't** have tight hip flexors at all - just weak glutes by comparison & hypermobile hip sockets need even more gluteal strength. Walking on level terrain or tread mill in plumb line is great exercise even though this cannot isolate weak muscles. Many clients on the brink of a hip replacement operation found just by giving up their office jobs & walking - relieved the pain hence no operation needed.

PLUMBLINE OR NEUTRAL SPINE: Joseph worked with PLUMBLINE spine (blocks level - side seam straight) but this NEUTRAL SPINE (meaning midway) varies in clients with imbalances. Neutral Spine term was invented by Physios 10yrs ago & has caused co-contracting & strain on the lower back instead of *isolating* the core **with** the deep Multifidi spine. Joseph called the Multifidi '**the 2nd spine**' & THIS is the back muscle we need to target – not the superficial erector spine & lumbar. Physios reasoning for working in the arched back position they call 'neutral' is apparently to compensate for the slouched position at desks. This is absurd as two wrongs do not make a right & in any case the thoracic spine (not the lumbar) is lax here & there are plenty of other exercises to correct this area. The only way the spine *instantly* changes is by tilting the blocks (pelvis or shoulder girdle). The spine still maintains its skeletal curve when blocks are plumb lined but when the legs are bent the Maximus glutes are lengthened so the lumbar should be flat (not imprinting waist line) with tail bone south. When legs straighten the max glutes are contracted creating a small gap but tail bone is **STILL** South. We were taught that only a dyna band can fit under spine at this stage – not your hand! Of course some clients may struggle when legs are straight if the Psoas is tight so bent leg position is the best way to isolate abs. Physios often teach exercises text book style without any physical understanding of the exercises themselves. It should be compulsory for all Physios to actually **DO** Pilates themselves before giving advice to clients (or none at all). Registered physios only need 4yrs study by comparison to a life-time of experience for ballet dancers/tutors correcting posture & training the core correctly. Conventional gyms & physios often teach clients to clench their butts & even brace their abs. In a plank for example, gripping or bracing external muscles shortens the spine & can create both lordosis kyphosis posture. A sportsman with very bowed legs had torn his meniscus & cruciate ligaments in both knees but the physio never checked his leg muscle imbalances. The vastus medialis quad is under-used & needs its partner/synergist the quadratus femoris which we sit on & biking is even worse in many obvious ways.

SITTING: Hypermobile hips can grip hip flexors as much as hypomobile ones as lengthy sitting is the problem. A paediatricist said that due to our lengthy sitting (using NO glutes) we should wear small heels to push the pelvis forward to engage glutes. Sitting on floor cross legged laterally rotated is best but if you have to be on a chair don't cross your legs parallel as this weakens the deep piriformus designed to help prevent intervertebral disks protruding on sciatic nerve. Stabilisers function is to hold – they are not supposed to be mobilised. Try top leg rotated horizontal keeping sit bones level on seat or use a Swiss ball as this challenges the pelvic stabilisers at least or use the sitting/standing at desks.

THE FOUR HIP FLEXOR MUSCLES: Like all mobilisers, hip flexors also need to be flexed fully but not for long periods as in sitting. All mobilising muscles must be flexible enough to avoid stretching tendons or ligaments so if any of these hip flexors are tight there is increased pressure on tendons/ligaments & vertebral column. When hip flexors (or any other mobiliser) cannot contract or stretch **fully**, this is an indication that they have been stabilising instead of mobilising so stretch them but you **MUST** strengthen the opposing glutes in order to transfer the stress. Shoulder bridges are a good start without clenching external Maximus glutes & there are so many ways to execute bridges but plumb line spine is imperative to prevent even further problems. In scissor exercise only move from hips with legs bent to show hip flexors are not gripping while core is isolated. The hip flexors are very deep & take patience when stretching but a tight or dominant hip flexor makes it impossible to engage the core correctly. If weight is held back on heels then all 4 hip flexors & quads may be gripping & retracting into hip sockets. A conscious effort is required until it is automatic as strengthening muscles only makes one *capable* of using them. Hereditary hyper or hypomobile hip sockets are apparent from birth but there is much that can be done later to avoid following a family history of hip replacements etc.

TIGHT or DOMINANT PSOAS MAJOR (the only muscle connecting core to legs & spine) = Pelvic tilt & lumbar back sway
Cause - usually weak glutes under butt (quadratus femoris) resulting in more lumbar back use than transverse abs

TIGHT ILIACUS (triangle across hips) = Sitting in hips

Cause - usually weak gluteus medius & internal oblique strength to maintain length of spine at sides.

TIGHT PSOAS MINOR (pubic bone to ribs) = Shortened front of spine (dominant rectus abs)

Cause - usually weak gluteus medius resulting in tight hamstrings pulling tailbone down & forward (under tucking pelvis)

TIGHT PECTINEUS (groin) = Limited rotation & abduction of legs

Cause - usually weak lateral hip rotators in glutes resulting in tight medial hamstrings (inner thigh)

ILIOPSOAS STRETCH: There are many stretches for the Psoas major in parallel like runners stride, dove etc but there is a great exercise to stretch out the Iliopsoas (Iliacus & Psoas joined) & at the same time challenge the core. Many clients with hypermobile hip sockets can do **HALF LOTUS** sitting up - but when laying on back (top foot on bottom knee) the Iliacus is targeted. Lowering the bottom leg is a challenge for glutes to maintain level hips. Flatten small of back via abdominal muscles while relaxing hip flexors is a proprioception challenge in itself so let gravity do the work. Advanced clients can apply contra resistance pushing both thighs down whilst maintaining flat back. Some clients are so tight the top foot won't reach bottom knee but the wider the knees the less stretch you get from Iliacus. Adductor magnus & maximus glute stretch can follow with top leg rotated to avoid stretching the lateral fibres of the stabilising gluteal rotators. Demi plie 1st position face down (prone) stretches iliacus further for dancers as they often find this start/finish position for allegro more difficult to use turn out muscles than a full plie (aim for pubic bone & feet on floor).

ILLIOSOAS STRETCH – SUPINE HALF LOTUS

