

## **PILATES - the best kept secret in back rehabilitation**

Dr Mary Holden - Sports Medicine Physician

Pilates is designed to give you suppleness, natural grace, and skill that will be unmistakably reflected in the way you walk, in the way you play, and in the way you work - Joseph Pilates.

Olympic athletes, international rugby and league players, and cricketers have joined Pilates classes; which were once the domain of ballet dancers and film stars. For the club players based at the Canterbury Bulldogs and Melbourne Storm; weekly Pilates and yoga sessions are a compulsory part of the clubs' injury prevention program. For the players, Pilates offers a dramatic improvement in performance, and a sporting career much less prone to interruption through injury.

### **The importance of Pilates**

One of the most important recent changes in medicine is the recognition of the importance of self-management. The regular use of Pilates has been found to be successful in preventing recurrent back pain episodes. Recent research from the Physiotherapy Department at Queensland University by Richardson and Jull, has demonstrated that by increasing the co-ordination and strength in the deep abdominal muscles, i.e. transverse abdominals, that the lumbar spine is stabilized and protected. These are the same conclusions that Joseph Pilates arrived at in the 1920's.

Muscle imbalances that generate pain have their origins in poor posture, poor health, workplace conditions, sporting injuries and repetitive strain on structures about the shoulder girdle and low back. All of the joints in the body should be held in their optimum natural position, in mid range, when muscles of both stabilizing and mobilizing types work together. Mobilizing muscles make things move, i.e. reaching out with your arm. These muscles tend to lie near the surface of the body, and are usually long muscles, working at 40-100% of the maximal voluntary contraction (MVC).

When your arm is moved away from your body, the muscles in the trunk have to work to stop you from falling over, i.e. to stabilize you. These muscles need to be able to work for prolonged periods i.e. endurance is required. They tend to be shorter muscles, and lie deeper within the body, working at only 20-30% of their MVC. When a person moves with good muscle recruitment and stabilizing muscles working, there will be minimal wear and tear on their joints.

Problems begin when a muscle comes under stress. The injured muscle either lengthens and weakens; or becomes short and tight. The movement still has to take place, but we adopt a different combination of muscles to achieve the movement. This is far less effective, i.e. a faulty movement pattern is established, so-called "cheating" mechanisms.

Certain muscles then become overused/over-recruited as the brain selectively recruits 'strong' muscles in preference to weaker ones.

After a while, bad postural habits feel quite normal, until pain sets in such as back trouble, shoulder injuries, tension headaches, neck pain, or knee injuries. No amount of undirected exercises will help, since the "cheat mechanisms" remain unchallenged by developing the mobilizing muscles and not the stabilizing muscles. It is a common mistake of many training programs to concentrate on the mobilizing muscles rather than the stabilizing ones. Muscles are then programmed to repeat the "movement mistakes", leading to habits which reinforce pain. Short tight muscles remain, so do long weak muscles, unless specific retraining of the weaker muscle group is undertaken.

Unfortunately the way out of this pathway is not by taking up a sport, or even by just going to the gym. Many sports actively enhance muscle imbalances, e.g. tennis. The existing bad habits are simply repeated in each situation, reinforcing the faulty movement patterns that have led to pain.

"As small bricks are employed to build large buildings, so will the development of small muscles help develop large muscles." - Joseph Pilates.

### **How to correct faulty movements:**

The movement patterns need to be repeated thousands of times the correct way, until they become automatic. Unfortunately the imbalances will have gradually crept into a person's lifestyle, and so the problem is not reversed overnight.

Pilates works by re-balancing the body, altering the way in which you recruit muscles to produce movements. It changes the way you use your body, the way you move - restoring natural, normal movement.

Pilates works on strengthening the stabilizing muscles, which lie close to and support the spine. Transverse abdominus is the deepest of the abdominal muscles, wrapping around the trunk horizontally, acting like a "corset" when engaged. Two other muscles are important in providing good stability in the trunk, the multifidus muscle in the low back, and the pelvic floor. This creates the solid cylinder around the central spine, helping to prevent shearing forces being applied to the vertebrae, ligaments and discs.

Pilates exercises are gentle, progressive, and performed slowly with good postural alignment at all times. These controlled movements are therefore unlikely to lead to re-injury. The **eight** principles of Pilates underpin each and every movement:

*Relaxation* - the starting point in a Pilates session, releasing unwanted tension from the body.

*Concentration* - "The Pilates method of body conditioning is gaining mastery of your mind over the complete control of your body." - Joseph Pilates. Constant focus on every movement is required.

*Alignment* - By keeping joints in neutral, unnecessary biomechanical stress is avoided, and "cheating mechanisms" corrected. All parts affect each other;

take the example of prescribing transverse abdominal exercise for the correction of Tendoachilles tendonitis.

*Breathing* - In order for the body to receive enough oxygen to perform the exercise, we must breathe efficiently. In order to keep the lower abdominals close to the spine; the breathing needs to be directed laterally, into the lower ribcage. Moving on the exhalation will enable greater core stability at the hardest part of the exercise, and prevents breath holding (Valsalva).

*Centering* - By engaging the pelvic floor with the transverse abdominals, the best stability is achieved.

*Coordination* - By repeating sound movements precisely, normal movement is restored. "Concentrate on the correct movements each time you exercise, lest you do them improperly and thus lose all the vital benefits of their value." - Pilates.

*Flowing movements* - Movements are natural, performed correctly, slowly, controlled so as not to strain. Lengthening occurs away from a strong centre.

*Stamina* - Energy will no longer be wasted on holding patterns from pain or stress, or from moving inefficiently. Pilates can make you fit for your chosen sport or activity by ensuring that the right muscles do the work.

Useful adjuncts to Pilates body control sessions include deep tissue massage, and the use of the Swiss Ball as a method of increasing the neural challenge.

Deep tissue therapy is directed at tissues that have habitually been held tight through the body's compensation for other weak stabilizer muscles e.g. Piriformis, Gluteal Medius, Pectoralis Minor, Quadrates Lumborum, Psoas, Upper Trapezius, Levator Scapulae.

Other muscles of the upper and lower limb that have been affected by the overload must also be released. The Swiss Ball offers the challenge (nearly) of working on an unstable surface; once a moderate degree of control exists in the core musculature. For the beginner or those with an injury that is in early rehabilitation, the Swiss Ball can offer too much challenge; and further injury is possible if performing an exercise that is too advanced for the current level of stability