INTEGRATED APPROACH TO REHABILITATION

THE MISSING STABILITY FACTOR

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Why can this guy squat on the physioball and you can't? Seems a bit unfair, seeing as you have been diligently attending training sessions, pushing yourself consistently while steadily increasing the load and intensity. So…

Why does this exercise remain so elusive?

Understanding the requirements of the body can give us insight into the execution of the movement. The human body needs mobile joints to function correctly, but the control of mobility and the ability to stabilise dynamically is often lacking.[1]

Figure 1: Squatting on the ball, the ultimate squat.

The approach most athletes think about when coming to physiotherapy is the traditional stretching the "tight" muscles and strengthening the "weak" muscles.[2] Unfortunately this is sometimes true. Focusing on muscle imbalances as the only culprit results in stability and motor control (control of mobility) frequently being overlooked in the design of rehabilitation and performance programmes.

As our understanding of functional anatomy and biomechanics improves, so does our knowledge of motor function and recruitment. We now know that we can classify muscles into mobilisers (responsible for movement) and stabilisers (responsible for stability at low loads). We can further sub-group stabilisers into local (control translations at small joints e.g. the spine) and global stabilisers (controlling motion through range). This knowledge enables us to diagnose dysfunctions within these systems and give the appropriate intervention to correct it.[3]

This leads us back to the ball squat. In order to achieve this feat of control and strength, the balance between the local and global stability system should work in harmony with the mobiliser system without any compensations. Compensation occurs in order to accomplish a functional task, despite the potential danger to human body (develop pathology or incurring injury).[2,3]

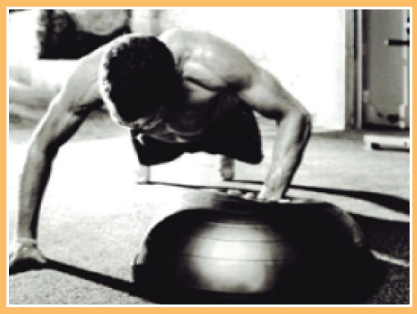

Figure 2: Lance Armstrong incorporating functional stability training into his programme.

A compensation commonly found in elite athletes are an excessive increase in the global stability system's force production and a substitution by the mobiliser systems for local stability.[4] This results in a co-contraction i.e. bracing movement especially during spinal, shoulder and pelvis stability exercises. Muscular co-contraction does not equate good stability especially if the exercise is performed at low load.[1,2]

Correct application of these exercises requires that breathing should not be affected, so if you hold your breath you are bracing not stabilising. Normal rotation should be able to take place with eccentric control and not restrict the movement, so if you are isometrically eliminating rotation you are bracing not stabilising. Finally reliable low load activation should occur consistently without fatigue, so if you are using different muscle firing patterns for the same exercise you are bracing not stabilising.[3]

Figure 3: Core training - Stabilisation at trunk while moving the extremities.

Performance depends on the correct integration of various factors including motor control. Incorporating functional stability as a component in rehabilitation is essential. Combining physiotherapy with the integration of exercises and manual techniques to facilitate the correct balance between mobility, strengthening and motor control (stability) is the basis for functional rehabilitation.[3] These principles are found in a variety of body-weight exercise systems that emphasises motor control for example Pilates and Yoga.[5]

Figure 4: Yoga and Pilates not what you think!

The above mentioned systems value lie not only in their stretching and strengthen ability (read strengthening not hypertrophy), but their greatest value lie in their ability to re-educate motor control. This results in improved neuromuscular control and correct muscle firing patterns, allowing for improved functional stability. Without a stable base, force production becomes ineffective as some energy is used for stabilisation.[4] Incorporation of functional stability into your training might just be what you have been missing all these years!

Figure 5: The human flag, not showing off but displaying a fully integrated motor system.

Improve your stability:[6]

1. Prone on elbows with trunk, hips and knees in neutral alignment. Bend at the knee and extend the hip past neutral by moving the heel towards the ceiling. Hold for one second and return to parallel. [Figure 6]

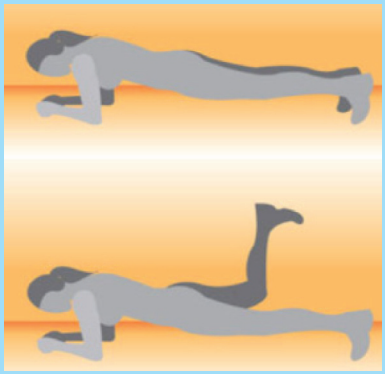

Figure 6: Front bridge with hip extension and knee flexion

2. Side-lying on elbow with shoulders, hips, knees and ankles in line. Raise the top leg up towards the ceiling keeping the foot of the top leg horizontal. Hold for one second and lower leg. [Figure 7]

Figure 7: Side bridge with abduction

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