

## THE FUNCTIONAL STRENGTH CONCEPT

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#### Introduction

Functional strength refers to the rehabilitation science of training the body to meet the specific demands of life and sport. It is the action of training the function, thereby preparing the body for a specific role for which it was designed and built. It is a total rehabilitation approach to improve sensory-motor control and obtain functional stability, thereby helping achieve optimal muscular stabilisation of the joint (2). It is an important part of the complete rehabilitation process. Functional exercises are performed in functional weight-bearing positions emphasising quality and efficiency of movement, coupled with alignment of the trunk and lower limb joints; this neuromuscular training also incorporates elements such as responses to perturbations (1). They are multi-planar exercises in a proprioceptively enriched environment using functional strength tools such as a medicine ball, or a bosu. Training functional strength focuses on movement patterns rather than an isolated recruitment of muscles (3).

#### Discussion

The goal of functional strength is to improve upper and lower extremity coordination and conditional skills, and increase lumbo-pelvic strength, endurance, balance and proprioception. This contributes to improved functional performance, biomechanics and activation patterns. There are three main concepts underlying functional strength. Firstly, it is the perfect link between pure strength and neuromuscular control. Secondly, it must deal with a specific purpose, be that the goal of the patient or a type of injury. Thirdly, it follows the progression of exercise load in relation to specificity and complexity. The first concept bridges the gap between strength and control. Movement patterns are ideated in the pre-motor cortex, motor cortex, with the control of sub-cortical structures, which give the impulse to the effectors. The effectors then act; this requires that the different muscle groups must act synergistically in a harmonized fashion creating the ideal force to stabilise a joint, or produce movement. This ideal force is functional strength, specific to the action required. In the absence of sufficiently adequate pure strength the body cannot generate the crucial functional movement, as the required forces are too much to stabilise the movement. Adequate muscle strength and endurance is a prerequisite for functional and postural stability, and movement patterning without compensations. This is why phase 3 of our method becomes such a vital part of the recovery process. The second concept is in relation to specificity. Functional strength is essentially specific strength. There are different types of muscle strength (eccentric, concentric, isometric; maximum, submaximum, etc.) combined with different levels of motor function (walking, running or playing football or basketball). The word functional strength identifies the necessary strength required to execute a specific motor function (e.g. force required to dunk a basketball). The exercise chosen must meet the function for which it was designed and built. This type of exercise is task-orientated, meaning targeted towards enhancing neuromuscular control for specific daily activities. This could be improving the gait of an amputated patient, to the other end of the spectrum such as improving the cutting maneuver of a professional football player. Thus if we want to build functional strength, one must understand what is the specific function that needs to be addressed.

The third concept means that one must respect and follow the gradual progression of exercise load in relation to specificity and complexity, ranging from dysfunction to optimal function in order to ensure optimal performance and prevent injury. Each distinct phase of rehabilitation must intend to progress sequentially and build on the previous phase to ensure optimal performance and injury prevention. This can be seen all the way through the 5 distinct phases of functional recovery:

Phase 1: resolution of swelling, pain and inflammation

Phase 2: recovery of range of motion and flexibility

Phase 3: recovery of strength and muscular endurance

Phase 4: recovery of coordination and proprioception

Phase 5: recovery of specific technical skills and return to sport

### **Conclusion**

To achieve the goal of functional strength we must adhere to the three concepts and incorporate them into all phases of the rehabilitation process.

### **References**

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