

The Sensorimotor System

The sensorimotor system that our bodies possess is the prime mechanism for not only quality movement, but the most basic of movement in itself. It includes all of the sensory, motor, and central processing aspects involved with maintaining joint homeostasis during bodily movements. In other words, functional joint stability. Maintaining this state of homeostasis for the joints is the major driving force of most of the physiologic functions of the body, if not all of them. The body is composed of many systems that operate automatically and subconsciously to maintain the body in a homeostatic condition – with the sensorimotor system being the main one.

Knowing this, one can appreciate the sensorimotor system and its influence on exercise, prehab, rehab, and all of the general movement that we possess and often take for granted. In Piaget's theory of cognitive development the sensorimotor stage happens to be the first, in addition to the one producing the most rapid amount of growth (from a cognitive standpoint). In this stage an understanding of the world through trial and error using senses and actions is developed. However, this system is much more complex than a simple input-output system that resides primarily in the lower, younger levels of motor control. Functional joint stability arises not only within the sensorimotor system, but from aspects synonymous with the entire motor control system of the body. Evidence for this is provided in the fact that many individuals return to preinjury levels in the absence of mechanical stability. This proves that some compensatory mechanisms can be developed to provide the supplemental stability required. This makes functional joint stability a complex process and one still in need of research, lacking a clear answer. However, the brain's control over functional joint stability may be the area that has the most significance to the development of preventive and rehabilitative strategies concerning injuries. Intervening at supraspinal (brain) levels may provide the key to promoting increased

stability from a preparatory perspective, rather than a reactive perspective. In other words, moving in a proper way to prepare the body for the exercise it is about to undergo, rather than just moving to move and then having to react in a way that is rehabilitative as one faces the consequences of their recent actions. For example, a client with the profession of a heart surgeon going on 40 years enters the gym. Due to their career, they have a significantly rounded thoracic spine as a result of all of the time they have spent participating in such faulty posture. This results in a change of their pathological and neurological perception of movement. It is our job to be aware in each moment of all of the movement and posture that we partake in so that we can prevent such deficiencies.

So, if functional joint stability is such a complicated process, then what is the takeaway from all of this? To answer that, as mentioned above, our mind and awareness as individuals to the movement that we take part in each day, no matter how simple or complex. Not only the body, but the mind as well. In Latin, this is known as “Corpus Animus” – meaning the combination of the body and mind as one. The practical application of such is how we apply this to our daily movement patterns. Not only should we move, but we should move with intention and purpose as our minds direct us through this process. In order to reach the exercise goals we strive for we must be a sniper with our training; this principle cannot be accomplished without the mind-body connection. In addition, in order to prevent the daily mechanical problems we have no desire for, we must also be a sniper with our movement and posture outside of the gym. Know not only the “how” behind exercise, but also the “why” and execute this with the most extreme focus to lead to a lifetime of better motor control and overall wellness.

References

Journal of Athletic Training 2002;37(1):71–84 q by the National Athletic Trainers' Association,

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