

## Movement Awareness, Proprioception, Posture and Balance

Effective athletic development is based upon the principle of the development of fundamental movement skill before specific sport skill. In generations past this was something that everyone took for granted because the demands of everyday living took care of fundamental movement. People at all ages were much more active. Children grew up active, free play was a major part of daily activity. It was natural to crawl, jump, hop, run, reach, lift, throw, etc; it was all done in a spontaneous playful environment. Even in the adult world there were less “conveniences” than today. People walked instead of rode. Physical labor was part of society. People generally participated rather than watched. As short a time as thirty years ago there was mandatory physical education from kindergarten through twelfth grade in every state in the nation.

The athletic realm does not exist independent of the rest of society; athletes are a product of the society they grow up in. There is no longer mandatory physical education to provide a foundation of movement skills. There is less free play and more organized sport activity. The net effect of all of this is a significant decline in fundamental movement skills. A sound athletic development program is founded on the basic locomotor skills developed to their highest level. These fundamental skills must be incorporated on a daily basis into the athlete’s training program regardless of the level of development. Obviously as the athlete progresses in training age and skill development fundamental skills should assume proportionally less of the training time. It is ironic that in my work with high level professional athletes that I have to spend a good portion of their training on fundamental movements because they never acquired these skills as part of their foundation. Instead they specialized early and refined their specific sport skills.

Fundamental movement skills fall into three broad categories: locomotor skills, stability skills and manipulative skills. Locomotor skills are as the name implies. They are the skills that get us from place to place. It encompasses the spectrum of the gait cycle from walking, to running, to sprinting. It also includes swimming in order to move in the aquatic medium. Since we are terrestrial beings the emphasis in our athletic development program is on variations of gait. In its most rudimentary forms it includes crawling.

Stability skills are those movements executed with minimal or no movement of the base of support. Balance is a key element. It is an important foundation of many sports skills especially those encompassing finer motor patterns.

The third broad category of fundamental movement skills consists of manipulative skills. This is simply control of objects with the hands or the feet. The application to sport skill is obvious. In our society the emphasis in manipulative skill is on work with the hands to the exclusion of the feet. This is a deficiency that must be addressed in a sports development program. Throwing and striking skills fall into this category. Better awareness and use of the lower extremities will pay rich dividends.

In order to effectively transfer (translate) the broad movement categories into refined movement patterns we need movement awareness. Movement awareness consists of those abilities necessary to conceptualize and formulate an effective response to sensory information necessary to perform a desired task or motor skill. This is FUNDamental work. It should be fun and mental in that it requires concentration. In order to train the components of movement awareness it is best to create an environment where the athlete is given a task orientation. This means that the athlete is given movement problems to solve that will enable them to discover movement skills in a “play like”

environment. "... one goal of functional training is to practice movements in order to make them automatic. Second, even though accomplished athletes may have little idea of what they focus on during skill execution, at some conscious or subconscious level they are focusing on relevant cues. For this reason, Singer et al advocated that skilled motor performance can be best achieved if learners adopt a nonawareness type strategy.

Nonawareness refers to a lack of attention placed on the activity while it is in progress, but learners are instructed to preplan the movement and focus on a specific situational cue. "(Ives and Shelley p180) Nonawareness means having the athlete focus on solving a particular movement task rather than focusing on how they should move "correctly." Movement is natural; by making it conscious there is a high risk of making it robotic.

Most of movement awareness activities can be addressed daily as part of structured warm-up. Structured in the sense that the thought and planning should be put into the sequence and timing of the activities, not the step by step orchestration or choreographing of the movement. The latter would defeat the purpose. The goal is to create an environment where the athlete can cultivate as rich a repertoire of motor skills to draw upon as a foundation for specific sport skill. "Rigorously defining proper form and the use of mechanical stabilization and anti cheating aids excessively constrain athletes exploration and problem solving movements, and bear little resemblance to what occurs in athletic performance." (Ives and Shelley p182)

- **Body Awareness** – this consists of an awareness of the whole body and the relationship to its parts. A key to body awareness is awareness of center. The relationship of hips to feet (base of support) and hips to shoulders as well as eye to hand and eye to foot coordination. Crucial to all movement and an integral part of

body awareness is opposition. In gait it is the arms swinging in opposition to the legs. It is not something we should have to think about, but it is something we can train and take advantage of.

- **Spatial Awareness** – this is awareness of the position(s) our body occupies in space. It is a sense of where you are in your environment. On the court or on the field it is sensing where you are in relation to the other people around you, even though they may not be in your direct sight. It is also a sense of where you are in tumbling, falling, and acrobatic skills that allows you to control your body.
- **Rhythmic Awareness** – our fundamental rhythm is the heart beat, all our bodily rhythms are derived from that. Sport movements are rhythmic in nature. This is highly related to music and dance. Movement is just a series of synchronous and asynchronous rhythms linked together.
- **Directional Awareness** – this has two components: laterality and directionality. Laterality is awareness of both sides of the body. Directionality is a sense of where we are going, forward, back, right, left, up and down. Effectively being able to move in all directions is a prerequisite for effective skill development.
- **Vestibular Awareness** – this is the information based on feedback from the vestibular apparatus located in the inner ear that provides information about the body's relationship to gravity. It is closely related to balance and body awareness. The vestibular sense provides two key inputs: the position of the head in relation to the ground and the direction of movement in space. Todd summarizes the physiology quite well: "However the result is accomplished, the fact is well established that the otoliths and semicircular canals are the seat of impressions of position and direction

of motion in space; and they are combined in the brain with the kinesthetic sensations of movement, weight pressure, and relative position, coming from other parts of the body, to give us our minute-to-minute information as to the movements of our limbs, neck and trunk, where we are at any given moment, and how we can get somewhere else.” (Todd, page 28)

- **Visual Awareness** – vision is a dominant factor in motor skill. Some experts have estimated that as high as 80% of all information we perceive is derived from visual feedback. Vision is closely tied to spatial awareness. It is the sense that modulates or regulates the other senses. This is a quality that is very trainable. It is also a quality that if taken away by simply closing the eyes can be used to heighten awareness.
- **Temporal Awareness** – this is a sense of timing. This awareness is crucial for performance where there are time constraints or a sense of pace is required.
- **Auditory Awareness** – this is the ability to discriminate, interpret, and associate auditory stimuli. For smooth efficient movement auditory awareness must be highly developed. Hearing allows us to get feedback as to the rhythm of movements. Something as simple as the sound of a foot strike in running is tremendous feedback to both the coach and the athlete.
- **Tactile Awareness** – This is a sense of feel and touch. There is a tendency to think of this as only the hands, but feel and touch with the feet is also very important. The whole body is a giant sense organ, so try to get away from thinking of tactile awareness as the exclusive domain of the hands.

Ultimately, what links this into a complete functional program is proprioception. Proprioception is awareness of joint position derived from feedback in the sense receptors

in the joints, ligaments, tendons, and muscles. It is a highly trainable quality. It is almost too simple. We must strive to constantly change proprioceptive demand throughout the training program. In fact this variable should be manipulated more frequently than change in exercise mode or change of exercise because it adapts so rapidly.

### References

Ives, Jeffrey C. and Shelley, Greg A. "Psychophysics in Functional Strength and Training: Review and Implementation Framework." **Journal of Strength and Conditioning Research**. Vol. 17 #1 pp 177 -186

Todd, Mabel E. **The Thinking Body**. Princeton Book Company Publishers. Highston, NJ. 1937