

Patty's PT Tips

September 1, 2021

Motor Skills Basics

Terms to understand:

Range of Motion (ROM)

Activity aimed at improving movement of a specific joint. This motion is influenced by several structures: Bone surfaces within the joint, joint capsule, ligaments, tendons, and muscles acting on the joint. Types of range of motion exercises: passive, active, and active assists. Passive range of motion is movement applied to a joint solely by another person or persons or a passive motion machine. When passive ROM is applied, the joint of an individual receiving exercise is completely relaxed while the outside force moves the body part, such as a leg or arm, throughout the available range.

Active range of motion is movement of a joint provided entirely by the individual performing an exercise. There is no outside force aiding in the movement.

Active assist range of motion is described as a joint receiving partial assistance from an outside force. It may result from the majority of motion applied by an exerciser, or an assistant, or a strap or pulley. It also may be a half-and-half effort on the joint from each source.

Flexibility

True flexibility is the ability to move through a full range of motion without pain.

Hyperflexibility is the ability to move beyond normal range of motion and may lead to joint instability and pain.

Balance

A biological system that enables us to know where our bodies are in the environment and to maintain a desired position. Normal balance depends on information from the inner ear, other senses (such as sight and touch) and muscle movement. Our sense of balance is specifically regulated by a complex interaction between the following parts of the nervous system:

1. The inner ears (also called the labyrinth) monitor the directions of motion, such as turning or forward-backward, side-to-side, and up-and-down motions.
2. The eyes observe where the body is in space (i.e., upside down, right side up, etc.) and also the directions of motion.

3. Skin pressure receptors such as those located in the feet and buttocks sense what part of the body is down and touching the ground or seating surface.
4. Muscle and joint sensory receptors report what parts of the body are moving. (proprioceptors)
5. The central nervous system (the brain and spinal cord) processes all the bits of information from the four other systems to make some coordinated sense out of it all.

Strength

Muscular strength is the highest amount of effort exerted by the muscles of the body in order to overcome the most resistance in a single effort. A large part of muscle strength is endurance, which is the muscles' ability to repeat the contraction for a longer period of time before it becomes exhausted.

Coordination

Body coordination is a performance-related fitness component that describes smooth, efficient movement patterns that are part of a specific function task. Your stage of motor learning influences how well you can perform these component movements of a skill.

Spasticity

Spasticity is a condition in which there is an abnormal increase in muscle tone or stiffness of muscle, which might interfere with movement, speech, or be associated with discomfort or pain. Spasticity is usually caused by damage to nerve pathways within the brain or spinal cord that control muscle movement. Symptoms may include *hypertonicity* (increased muscle tone), *clonus* (a series of rapid muscle contractions), exaggerated deep tendon reflexes, muscle spasms, *scissoring* (involuntary crossing of the legs), and fixed joints (contractures). The degree of spasticity varies from mild muscle stiffness to severe, painful, and uncontrollable muscle spasms.