

Variations in Muscle Tone

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What is muscle tone?

Muscle tone refers to how tense a muscle is at rest. Tone prepares the muscle for movement and supports the muscle and surrounding structures as they move.

Tone is dynamic—it changes automatically, according to the situation. Your tone is probably lower when you are resting quietly than when you are cheering for the home team at the football game.

Some things that can influence normal muscle tone are:

- The level of emotional stress
- The level and kind of music being listened to
- The temperature
- The level of physical activity
- Inherited—genetic—traits.

Normal tone feels firm and allows muscles to be lengthened so the joints can move normally. It also helps the muscles move smoothly and voluntarily.

Muscle tone is monitored and controlled by the brain. The brain uses information from the muscles, from other parts of the body, and from what is happening in the environment to automatically adjust tone. Damage to the brain sometimes alters muscle tone. Tone may increase, decrease, or fluctuate, depending on the area of the brain that is damaged.

What are the different types of tone problems?

Rigidity is very high muscle tone. This tone holds the joints very tightly and does not allow movement. It is very difficult to move the joint, but when it is moved beyond an initial range the tone is released, and then there is very little resistance. This is known as “clasp knife rigidity.” It is similar to closing a pocket knife—there is strong resistance at first, but then the blade snaps shut.

Hypertonus is the abnormally high tone known as *spasticity*. Spasticity results in a resistance to movement and in limited motion

in joints. The muscle tone is so high that it prevents smooth, coordinated, voluntary movement. The child appears stuck in abnormal positions and moves in abnormal patterns. When another person tries to move a joint, there is resistance throughout the range of movement. Sometimes this resistance feels like pulling on a large rubber band.

Hypotonus is low tone and is often described as *floppy*. Low tone does not support the joint well, so the joints are loose and may be described as double-jointed. It is easy for another person to move the joint, and when the child moves, the child may seem weak and slow to respond.

Fluctuating tone (changing tone beyond normal ranges) is seen in **athetoid** types of movement. Athetoid means “without posture” and appears as random uncontrollable writhing movements. Athetosis makes fine motor and controlled movements in midranges very difficult. Once the movement has begun it is difficult to stop or to smoothly “grade.” The dominant tone may be too high (tension athetosis) or too low (choreo athetosis).

Dystonia means abnormal tone. Most abnormal muscle tone caused by brain injury is of this “mixed” type. Tone is influenced by body positions; in dystonia, tone may be too high in some positions and too low in others. Sometimes tone is low in the neck and trunk and high in the arms and legs.

Is there any help available for my child?

The physiological and therapeutic significance of muscle tone is still not fully understood. Therapies, surgical procedures, and medications have been developed to attempt to alter abnormal tone and to allow more functional movement. Some treatments are moderately successful, but abnormal muscle tone caused by brain damage still cannot be completely corrected.

Therapists, physicians, and researchers continue to gather more information and to develop better treatments. Pediatric occupational and physical therapists can help you understand and work with your child’s muscle and motor development.