The stretch reflex (myotatic reflex) is a muscle contraction in response to stretching within the muscle. It is a monosynaptic reflex which provides automatic regulation of skeletal muscle length.

When a muscle lengthens, the muscle spindle is stretched and its nerve activity increases. This increases alpha motor neuron activity, causing the muscle fibers to contract and thus resist the stretching. A secondary set of neurons also causes the opposing muscle to relax. The reflex functions to maintain the muscle at a constant length.

Gamma motoneurons regulate how sensitive the stretch reflex is by tightening or relaxing the fibers within the spindle. There are several theories as to what may trigger gamma motoneurons to increase the reflex's sensitivity. For example, alpha-gamma co-activation might keep the spindles taut when a muscle is contracted, preserving stretch reflex sensitivity even as the muscle fibers become shorter. Otherwise the spindles would become slack and the reflex would cease to function.

This reflex has the shortest latency of all spinal reflexes including the Golgi tendon reflex and reflexes mediated by pain and cutaneous receptors.

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Last update: **2024/06/07 02:59**