

**M** is for motor function. Assessment of motor function is performed from birth throughout life and is actually part of an overall neurological examination.

Motor function assessments are performed on adults for many reasons such as:

- Determine the presence and extent of musculoskeletal injury or disease
- Determine the presence and extent of neurological illness or injury
- Determine degree of independence in activities of daily living
- Determine level of assistance needed
- Determine rehabilitation goals and progress towards goals
- Determine level of disability

The body's voluntary motor function is primarily controlled by the motor cortex of the brain. The motor cortex is located in the rear portion of the frontal lobe, just before the central sulcus (furrow) that separates the frontal lobe from the parietal lobe. The motor cortex is responsible for coordination of planning, control, and executing voluntary movements.

Signals from the motor cortex cross paths in the spinal cord to activate skeletal muscles on the opposite side of the body. Thus the right side of the brain controls movement of the left side of the body. Body parts with complex repertoires of fine movement, like the fingers and hands, require a larger percentage of the motor center of the brain than the trunk or legs whose muscle patterns are relatively simple.

The cerebellum is a portion of the brain located at the base of the skull. For an individual to perform a simple gesture such as touching the tip of your nose, it is not enough for your motor cortex to simply commence your hand and arm muscles to contract. To make the various segments of your hand and arm deploy smoothly, you

must have an internal "clock" that can precisely coordinate the sequence and duration of the elementary movements of each of these sequences. This "clock" is located in the cerebellum.

Abnormalities of the motor system are assessed by evaluating the patient's muscle size, tone, tenderness, strength and involuntary or abnormal muscle movement (called chorea or athetosis). Diseases or injuries to the muscles and/or to the nerves innervating muscles can cause weakness and atrophy (wasting or degeneration). Muscle tone can be decreased (flaccid) or increased (spasticity) as a result of disease or injury.

When assessing motor function, the examiner looks for symmetry between the sides of the body. Muscle strength is graded on a scale of 0 to 5.

- 5/5 = full range of motion against gravity with extreme resistance
- 4/5 = full range of motion against gravity with some resistance
- 3/5 = full range of motion against gravity, but not against added resistance
- 2/5 = full range of motion with gravity eliminated
- 1/5 = slight contraction visible
- 0/5 = no movement

Gross motor skills are often evaluated by asking the individual to walk, shrug the shoulders, or simply move the arms and legs. Tests for fine motor skills include pinching the fingers together, picking up objects, and touching the tip of the nose.

Motor function tests are performed from birth to death to help the individual to achieve the highest level of independent motor function possible.