The Neurologic Examination: Inspection and Palpation

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CME Information

INSPECTION AND PALPATION

Most patients with movement disorders do not experience muscle wasting or hypertrophy. The exceptions to this are patients with dystonia, who may develop hypertrophy related to their disease, and disuse atrophy, which may occur in weakened muscles associated with spasticity. **Fasciculations**, which are **involuntary contractions of the muscle fibers innervated by a motor unit**, can be visualized as muscle **twitches or dimpling under the skin**. These fine quivering movements occur more commonly in patients with lower motor neuron disease and not those with movement disorders. Muscle tenderness (myositis) is not typically a finding when assessing the patient with a movement disorder.

Assessing Tone

To properly assess tone (i.e., the baseline amount of muscle resistance to passive movement about a joint), the clinician must move each of the patient's limbs through its full range of motion at two or more joints. Abnormalities of tone that may be encountered include **hypotonia**, or **too little tone**, and **hypertonicity**, an **elevated amount of tone**. In its **extreme state**, **hypotonicity** is referred to as **flaccidity**.

When hypertonicity is encountered, the next step in the assessment is to determine whether the increased tone is **spasticity** (which is defined **as a velocity-dependent increase in stretch reflexes** that results from an **upper motor neuron lesion**) or **rigidity** (which results from a lesion or process occurring in the **basal ganglia**). The difference between the two is in their relationship to directionality and velocity. With **rigidity**, the examiner feels the i**ncreased resistance during flexion and extension**. With **spasticity**, the **resistance is more unidirectional -- i.e., only with flexion or extension, but typically not both**. With **rigidity**, the examiner appreciates the difference in increased resistance at all speeds of movement; with spasticity, the examiner detects the resistance at higher velocities -- i.e., **the faster the joint is moved, the more resistance** that the examiner feels. **The point at which** the examiner encounters resistance in spasticity is known as **the spastic catch**. Conversely, when the examiner is encountering **resistance while moving a spastic limb** through its range of motion, in some patients she or he will reach a point at which **the resistance "gives way"** -- this is called the **clasped knife phenomenon**.

Although **rigidity** is a common finding on examination, patients with **Parkinson's disease** do not typically report having rigidity per se; instead they may express that they are having stiffness in their shoulders or other muscles or arthritis-like symptoms. **Cogwheel rigidity** is a particular type of rigidity that is frequently

found in patients with Parkinson's disease. When the affected arm is moved through its range of motion at the elbow, the examiner will encounter **a ratcheting type sensation**, particularly when palpating the biceps tendon. To elicit cogwheel rigidity, it may be necessary for the examiner to ask the patient to mirror the movements that the examiner is performing, i.e., to move his or her arm in the same manner in which the examiner is passively moving the opposite arm.

Assessing Function

When assessing function, it may be necessary to ask the patients to perform the activity -- such as finger, hand, or foot tapping or alternating pronation and supination of the hand -- for some period of time. Characteristic of **parkinsonian syndromes** is **a difficulty with initiating movement**. Once initiated, the movements of patients with **Parkinson's disease are fairly rhythmic, however**, as opposed to those of patients with **cerebellar disorder**, which have an **irregular rhythm**. The movements of Parkinson's disease tend to be relatively slow and of a decreased amplitude. Another distinguishing feature, and the purpose of observing the patient for some time, is that patients with Parkinson's disease often have a slowing of movements with repeated performance of the task, whereas patients with cerebellar disorders can typically sustain the speed of movements ad infinitum. Poor accuracy in the movements is characteristic of cerebellar disorders. Patients with **Parkinson's disease** or other parkinsonian disorders may be **unable to perform rapidly alternating pronation and supination as the result of akinesia or rigidity**.

Assessing Strength

To detect asymmetry in strength, each muscle group should be tested along with its contralateral counterpart. A 6-point scale, such as the one included below, can be used to rate muscle strength. With the exception of patients who have spasticity, strength should be normal in most if not all movement disorders; in addition, patients with chorea may have what is known as a milkmaid's grip in which there is a fluctuation in grip strength.

Score	Finding
5	Normal strength
4*	Some resistance but movement is possible
3	Movement is possible against gravity but not against resistance by examiner
2	Movement possible, but not against gravity
1	Muscle flicker but no movement
0	No muscle contraction

*often subdivided as -4, 4, +4

The examiner should also check for drift, which may be indicative of an upper motor neuron lesion (e.g., **trauma, MS, stroke**). When patients with an upper motor neuron lesion are asked to extend their arms, supinate their hands, and hold them parallel to the floor, they may have a subtle turning in and downward drift.

Assessing Posture

Posture is typically assessed by having the patient stand, while the examiner looks for **sway or instability**. Any movement disorder that is the result of a **cerebellar dysfunction** will result in **ataxia, a swaying unstable posture**. Postural instability is a common finding in **Parkinson's disease** and in other atypical parkinsonian syndromes, such as PSP. The examiner can test for instability by standing behind the patient and asking the patient to maintain her or his balance. The examiner then attempts to briskly pull the patient back while being careful to prevent the patient from falling. Note should be made of the results of this pull test, i.e., the patients ability to recover from being pulled backward.

The examiner should also ask the patient to stand with his or her **eyes closed**, and note should be make of any ataxia.