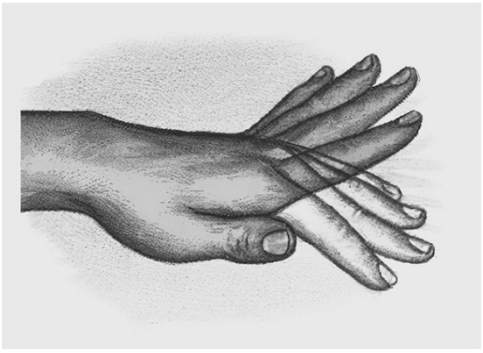
Myoclonus

Myoclonus – which can look like brief shocks of non-voluntary **activation** or **inhibition** of muscle groups – can present challenges to physical therapy intervention. Though PTs are not responsible for diagnosing its cause (which may be an emergency), it is essential to clearly identify and describe this and other pathologic movement accurately because we may be the first healthcare providers to observe it. Helping care teams identify clinical syndromes earlier during illness episodes through judicious physical exam is a core responsibility of effective practice.

In the hospital setting, new myoclonus more commonly results from metabolic or drug-related causes (toxicity or withdrawal), though in a general population, it is more likely a symptom of epileptic activity. It may be seen in post-hypoxic states.

Positive myoclonus looks like non-volitional bursts of muscle activity, while **negative myoclonus** looks like bursts of muscle inhibition. A single muscle group can be affected, or movements can be diffuse. **Asterixis**, the inability to maintain a static position as is sometimes observed in patients with severe hepatic insufficiency, is a form of negative myoclonus.



Bilateral "flapping tremor" (oscillating wrist flexion/ extension) when a patient is asked to maintain a position of shoulder flexion and elbow extension is commonly described as asterixis.

Myoclonus can be a symptom of neurodegenerative disease. It may even be the only symptom: cases have been described in which progressive asymmetric myoclonus, primarily associated with active movement, presents as an isolated symptom, though is not task-specific.

Myoclonic jerks can be rhythmic or non-rhythmic, and importantly **may worsen** with intention and active movement, depending upon the underlying cause or point of origin. The diaphragm may be affected (hiccups) as well as axial and appendicular muscles. Non-volitional jerking movements can be seen in patients at any level of consciousness.

Several parameters can be described, and describing pathologic movements in this way may be helpful even if you aren't sure whether what you're seeing is myoclonus.

- Are abnormal movements localized to one muscle group? Are they unilateral? Which muscle groups are involved, specifically?
- Are the observed movements rhythmic?
- Are non-volitional movements episodic, or continuous? How long do episodes last?
- Are movements elicited or exacerbated by active movement? Is there a difference between movement instructed by examiner, and self-initiated movement of the patient? Are abnormal movements present at rest? Does the patient continue to use the affected extremity during an episode of non-volitional movement?
- Do jerking movements occur with greater frequency or amplitude during weight-bearing? Do other positions or stimuli elicit or exacerbate movements?
- Does the patient's alertness change at all during episodes of non-volitional movement?

Even severe, diffuse myoclonus does not exclude patients from PT intervention in the hospital, and benefits of mobilization in critically ill patients are well-established.

To maximize safety, remove any possibility for a fall in patients with myoclonus: stand-step transfer with no space between bed and chair, for example, and use a chair follow and additional support for ambulation.