



## NASA 10 Minute Lean Test | Instructions for Providers

Orthostatic intolerance (OI) is an umbrella term used to describe abnormal autonomic nervous system response to orthostatic challenge. Orthostatic hypotension (OH), neurally mediated hypotension (NMH) [or neurogenic hypotension] and postural orthostatic tachycardia syndrome (PoTS) are terms used to describe variants of this response. The new evidence-based IOM clinical criteria for ME/CFS establish that orthostatic intolerance is a common and often overlooked feature of illness that is objectively measurable. OI may contribute to dizziness, fatigue, cognitive dysfunction, chest and abdominal discomfort, and pain manifestations.

**We recommend that all ME/CFS and Fibromyalgia patients have a NASA 10-minute Lean Test to assess for orthostatic intolerance.**

The test will be most revealing if measures that reduce orthostatic intolerance are withheld before testing. For example: limit extra fluid and sodium intake, do not wear compression socks and alter the intake of medications that might influence the test (see below). These treatments can be resumed after the test. Use continuous monitoring devices when possible.

Ask the patient to remove shoes and socks and lie down on a bed or exam table in supine position. After patient has been lying quietly 5-10 minutes, record blood pressure and pulse. Repeat a minute later. If repeat vitals are not similar, retake until two consecutive vital readings are relatively consistent. The goal is to determine the average resting supine blood pressure and pulse.

Next, ask the patient to arise, stand straight and lean against the wall, with only shoulder blades contacting the wall, and heels approximately 6" from the wall. Coach patient to relax as much as possible. Once the patient is leaning against the wall, start the timer and record the first standing blood pressure and pulse. Repeat blood pressure and pulse every minute for the next 10 minutes. Instruct patient not to talk and chat, except to report symptoms, and to resist moving feet or shifting weight. Observe patient for lightheadedness or signs of pre-syncope and stop the test if the patient is about to faint. Observe skin and extremities for swelling or changes in color and temperature. Assess cognition. Include any comments as applicable. A template that can be used to record blood pressure and pulse follows on page 2.

General test preparation instructions, directed by provider, adjusted as appropriate for each patient.

- Limit fluid intake to 500-1000 mL of water and fluids for 24 hours before the test
- Limit sodium intake for 48 hours before the test
- Do not wear compression socks or clothing on the day of the test
- Withhold medications, supplements, or substances that might raise blood pressure or increase heart rate, with timing based on the drug half-life and patient safety.
  - Examples:
    - midodrine or Northera
    - fludrocortisone
    - beta blockers such as propranolol, metoprolol or atenolol
    - stimulants such as methylphenidate, dexadrine or caffeine
    - tricyclic antidepressants (TCA)-- amitriptyline, doxepin or cyclobenzaprine





## Orthostatic Vital Signs/The NASA 10-minute Lean Test

	Blood Pressure (BP)		Pulse	Comments
	Systolic	Diastolic		
Supine 1 minute				
Supine 2 minute				
Standing 0 minute				
Standing 1 minute				
Standing 2 minute				
Standing 3 minute				
Standing 4 minute				
Standing 5 minute				
Standing 6 minute				
Standing 7 minute				
Standing 8 minute				
Standing 9 minute				
Standing 10 minute				

