



# INITIAL ORTHOSTATIC HYPOTENSION (IOH)

## General Information

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# What is Initial Orthostatic Hypotension ?

**Initial Orthostatic Hypotension (IOH) is a common form of orthostatic intolerance. It is characterized by a large drop in blood pressure within 15s of standing. IOH is not due to autonomic dysfunction therefore recovery typically occurs without intervention within 30-60s, however, it can on occasion lead to a faint. It most commonly occurs when an individual stands after waking up or after they've taken a few steps. It can also occur anytime an individual stands up after a prolonged period of rest (as quickly as after only 2 minutes of rest), whether that's lying down or sitting.**

**Common presyncope symptoms associated with IOH are:**



LIGHTHEADEDNESS  
(most common)



BLURRED VISION



NAUSEA



HEADACHE



SHORTNESS OF BREATH



TREMULOUSNESS  
(internal shaking)



BRAIN FOG



RAPID HEARTBEAT



CHEST DISCOMFORT


Typically when a healthy individual stands up, there is a large shift of blood from the chest to the lower body (abdomen and legs) due to gravity. The normal response to this shift is our blood vessels begin to constrict and heart rate increases to maintain blood flow back towards the heart. However, in IOH, there is excessive vasodilation that occurs when standing which causes (transiently) insufficient blood flow back up towards the heart and brain, which is when presyncope symptoms occur, as the brain is temporarily not receiving enough blood (<15s). Since individuals with IOH generally have an intact autonomic system though, their body is quickly able to adapt once it detects this large drop in blood pressure and blood vessels begin to constrict to restore blood pressure to a normal level (30-60s).


An interesting thing about IOH is that it typically occurs during an active stand, and not during a passive head-up-tilt (HUT). This could be important for a clinical setting if an individual were being tested at a syncope clinic, IOH likely would not present during a HUT table test. This is due to the idea that IOH is likely caused by the brief muscle contraction required to stand which results in rapid and excessive vasodilation in the lower body muscles used to stand. During a passive tilt, the lower body muscles are not actively engaged, therefore individuals with IOH are typically not symptomatic during a HUT.


"I look like a relatively "young" healthy person, but I have to move very slowly and I can't always control the situation so that's difficult. That's really difficult."

- IOH patient

## Diagnostic Criteria:

 **HISTORY**  
History of presyncope symptoms immediately upon ACTIVE standing

 **RECOVERY**  
Recovery of symptoms without intervening, typically within 30-60s of standing

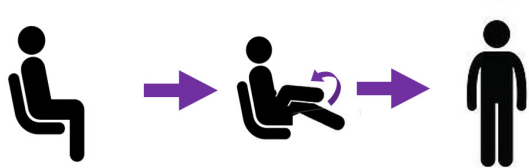
 **CONFIRMATION**  
Confirmation of diagnosis can be obtained by non-invasive beat-to-beat blood pressure monitoring - if SBP drops  $\geq 40$ mmHg or DBP drops  $\geq 20$ mmHg

## What are the treatments for IOH?

There are no approved medications for IOH nor any studies exploring pharmacological treatment of IOH; however, symptoms can be managed with a series of exercises. See below:

### 1. **PREACT** - Pre-activate leg muscle before standing through seated knee raises for 30s

While seated, raise one knee up towards your chest by actively engaging your core muscles, then lower that leg and do the same for the other leg. repeat this process for approximately 30 seconds before standing.



### 2. **TENSE** - Cross and tense your legs immediately after standing for at least 30s

Immediately upon standing, cross your legs and squeeze your lower body muscles together (legs & buttocks) for approximately 30 seconds.



For a demonstration of these exercises, please watch the following video:



Scan QR code or visit:  
<https://youtu.be/9M4NqQkcRaM>

These cost-free techniques require no equipment, medication or preparation and can be done anywhere to effectively reduce symptoms.

# Ways to Distinguish from other forms of Orthostatic Hypotension (OH)

## CLASSIC OH (cOH)

Sustained drop in SBP  $\geq 20$  mmHg and/or DBP  $\geq 10$  mmHg

Occurs within 30s - 3mins of active stand or HUT

Can occur due to some form of autonomic dysfunction

## DELAYED OH (dOH)

Drop in SBP  $\geq 20$  mmHg and/or DBP  $\geq 10$  mmHg

Occurs after 3mins of active stand or HUT

Can occur due to some form of autonomic dysfunction

## INITIAL OH (IOH)

Drop in SBP  $\geq 40$  mmHg and/or DBP  $\geq 20$  mmHg

Occurs within 15s of active standing

Often occurs in people who considered healthy

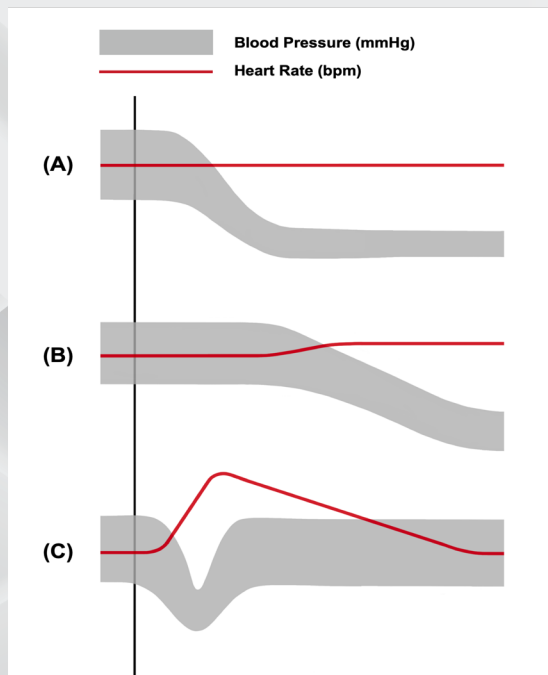


Figure 1. Schematic of the change in BP and HR upon standing for cOH (A), dOH (B), IOH (C).

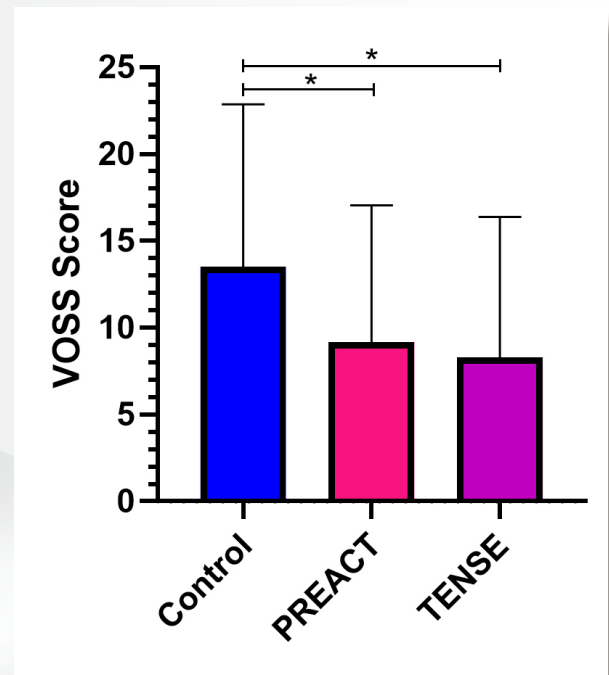


Figure 2. Vanderbilt Orthostatic Symptoms Scores (VOSS) for sit to stand maneuvers without any intervention, with the preactivation (PREACT) and the muscle tensing (TENSE) interventions. VOSS is an acute score of symptoms that are worse when upright, and higher scores indicate a higher symptom burden.

## REFERENCES

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