

## Supportive Therapy for Post-COVID-19 Symptoms of Orthostatic Intolerance (low blood pressure or fast heart rate with standing)

Some people report palpitations (the feeling that the heart is beating too hard or too fast), dizziness/lightheadedness and changes in blood pressure that occur with upright posture (such as standing in line, standing in a shower, standing up quickly, or even sitting at a desk for long periods), after being in a warm environment, after exercise and even after emotionally stressful events that persist after COVID-19 infection. Among other causes, these symptoms may be related to dysfunction of the autonomic (“automatic”) nervous system in which the nerves that are not under voluntary control, like the ones that control your heart rate, do not function properly. This can affect your ability to perform activities of daily living and contribute to feelings of fatigue, shortness of breath, light headedness palpitations, and brain fog. Over time, many people do recover. Until then, the following supportive measures may be helpful in dealing with your symptoms:

1. Make sure you keep hydrated. Drink at least 2 liters of fluids a day - preferably water although you may consider electrolyte rich fluids such as sports drinks with low sugar. It is generally better to drink large amounts quickly (1-2 cups of cool to cold water all at once) rather than sipping throughout the day.
2. Avoid high carbohydrate meals including excess sugar as this can sometimes bring on or make your symptoms worse.
3. Compression garments such as stockings or abdominal binders may be used for people with abnormal drops in blood pressure on standing.
4. Use postural maneuvers such as: standing with one's legs crossed, squatting, standing with one leg on a chair, sitting in the knee-chest position, leaning forward with hands on the knees when sitting. If you need to stand up for a prolonged period of time, you may “march in place” to keep your leg muscles active.
5. Use isometric counter-pressure maneuvers of the legs (leg crossing), or of the arms (hand grip and arm tensing) when performing activities that may lead to symptoms.
6. Elevate the head of the bed slightly by 10-15 degrees, so that the head is higher than the feet, a position that appears to help the body retain fluid at night
7. If you do not have high blood pressure or other known cardiac conditions, you may increase your salt intake. Discuss this further with your health care provider, but increasing salt up to 2-3 tsp (3 to 6 grams or 3000 to 6000 mg of sodium chloride or NaCL) daily may improve your symptoms. Most people will need salt tablets to achieve this high level of salt. Salt tablets may be taken with meals. Use the lowest amount of salt that helps with symptoms, starting with low doses and escalating up slowly as needed. Check your blood pressure regularly to make sure you do not develop high blood pressures.
8. Under the guidance of your health care provider, prescription medications such as beta blockers may help with palpitations (fast heart rate).
9. For people with abnormal drops in blood pressure on standing, medications such as fludocortisone, pyridostigmine and midodrine may be considered by your health care provider.

10. For people with persistent symptoms or who have a constellation of other “parasympathetic” symptoms (like flushing, nausea, sweats, etc.), medications such as glycopyrrolate or ipratropium may be considered by your health care provider.
11. Graded exercise, meaning a gradual step-wise increase in the amount of exercise per day, is probably one of the most important recommendations for people with dysautonomia, especially for those with palpitations and fatigue. You can start out with just a few minutes a day if that’s all you can tolerate before you start getting palpitations. But with time, gradually increase the amount of exercise per day. Specific exercises include:
  - Stationary recumbent bicycle
  - Isometric exercises
  - Clenching your fists or crossing your legs while seated or lying down
  - Rowing machine
12. Core strengthening is a key step to improving orthostatic intolerance. There are many different exercises that may help with core strengthening. You may search for exercises online or work with a physical trainer on exercises that are right for you.
13. Mind body therapies such as yoga, tai chi, qigong and meditation may help with symptoms.
14. Avoid prolonged sitting, quiet standing, warm environments, and vasodilating medications. Take shorter showers and baths and aim for a cooler water temperature. Avoid saunas, hot tubs, or going out in hot weather whenever possible.
15. People often ask – how do I know if I’ve done too much? Follow the 2-hour rule. After an activity such as exercise, cleaning your house or shopping, you should feel refreshed or neutral. If you feel tired or worse than you did before you did the activity then that was too much. Next time, adjust your activity or do a little less. In addition, if you feel “wiped out” the following day, adjust your routine to avoid feeling worse the next day.

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