



## Postural Tachycardia Syndrome Perspectives for Patients

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When a person stands up, he or she assumes that the body will automatically make any changes necessary to compensate for the increased gravitational stress this change of position brings. Indeed, standing causes gravity to try to pull nearly one quarter of the body's blood downward toward the lower arms, legs, and abdomen, reducing the amount of blood available to keep the brain supplied with oxygen. To maintain a constant oxygen supply to the brain and upper body, standing is normally accompanied by an automatic increase in heart rate and the force with which the heart contracts and, most important, a tightening of the blood vessels in the lower part of the body. The combination of these 3 actions pushes blood upward against the force of gravity, thereby maintaining an uninterrupted flow of blood to the brain. The aspect of the nervous system that governs these responses is referred to as the autonomic (or automatic) nervous system.

In some individuals, any one of these compensatory responses to upright posture may fail and thereby restrict an individual's ability to stand up (or remain standing). This inability to adjust successfully to (or maintain)

upright posture is called orthostatic intolerance. Postural tachycardia syndrome (POTS) is one type of orthostatic intolerance.

In some people, orthostatic intolerance occurs because of a failure in only 1 of the 3 compensatory actions mentioned previously. In these cases, the other 2 compensatory actions will increase markedly as a way of making up for the loss of the third. Patients suffering from POTS usually display an inability to maintain tightness in the blood vessels of the lower body during standing. Gravity then pulls more blood than usual downward when upright, and the heart rate and force with which the heart beats increase significantly in an attempt to compensate. The patient with POTS notices the heart beating rapidly and forcibly while standing (many describe this sensation as heart pounding).

In some people, the increase in heart rate and contractive force will not fully make up for the loss of blood vessel tightening in the lower body, and greater-than-normal amounts of blood accumulate in the lower body while upright. If enough blood accumulates, there will be a reduction in the amount available to supply the brain with both

oxygen and nutrients. Depending on the degree of reduction, the individual will experience a sense of fatigue, an inability to concentrate, lightheadedness, headache, visual blurring, black spots in the field of vision, and ultimately loss of consciousness.

At present, we define POTS as an excessive increase in heart rate associated with symptoms of more than 3 months' duration (in the absence of other conditions that could mimic this such as dehydration). In POTS, the heart rate increases 30 beats per minute (or exceeds 120 beats per minute) within the first 10 minutes of standing.

### What Causes POTS?

POTS may occur alone (primary), or it may occur because of another medical condition (secondary). Although the exact causes are still being researched, many POTS patients report that they first began to experience symptoms after a severe viral infection. Other patients report that their symptoms began after a surgery, pregnancy, or severe trauma (such as a motor vehicle accident). Some patients develop POTS as a consequence of long-standing diabetes or as a symptom of cancer.

The information contained in this *Circulation* Cardiology Patient Page is not a substitute for medical advice, and the American Heart Association recommends consultation with your doctor or healthcare professional.

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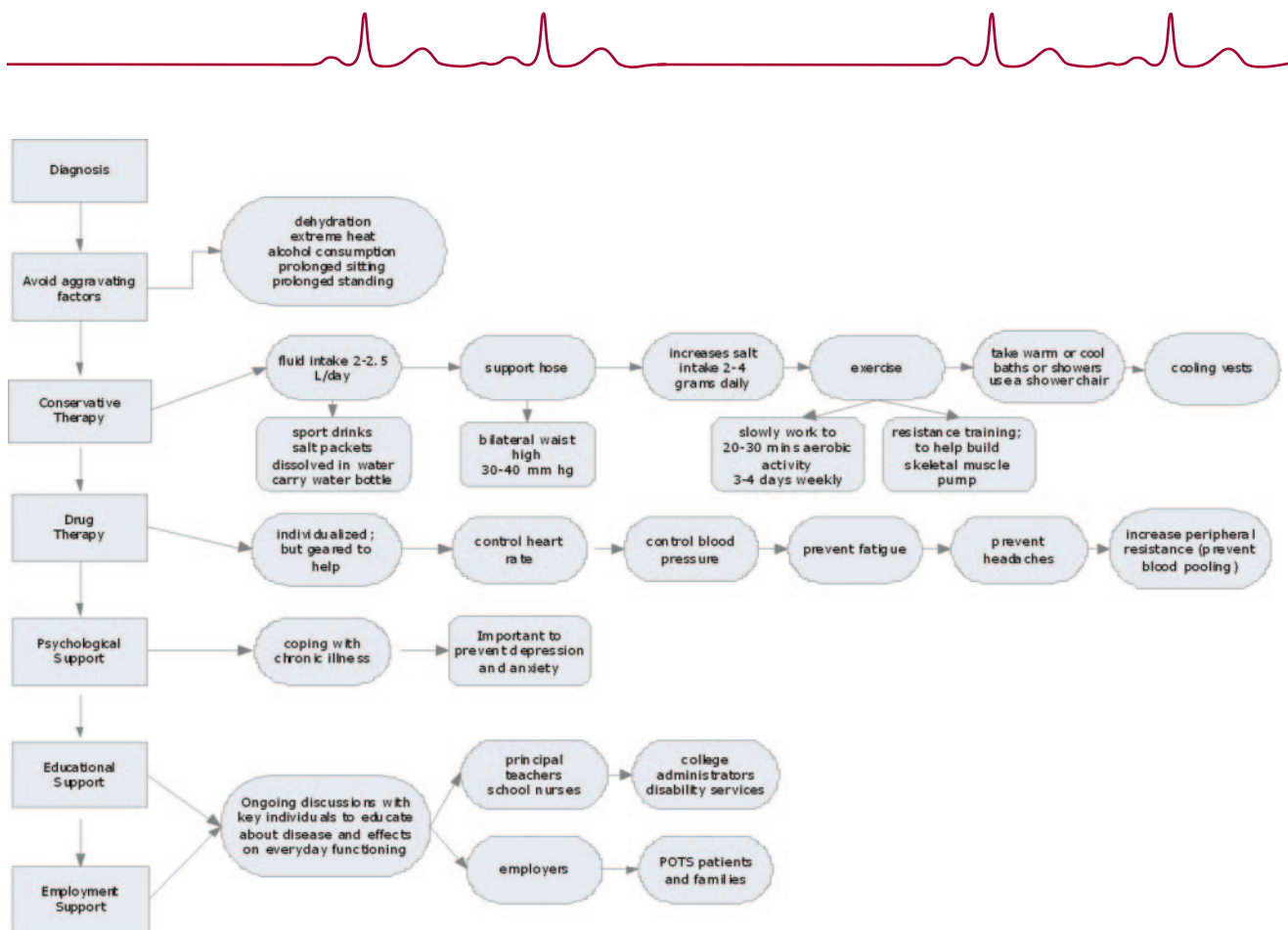


Figure. Treatment strategies for POTS.

**How Is POTS Diagnosed?**

Your physician will take a detailed history and perform a complete physical examination, which will include the blood pressure and heart rate lying, sitting, and immediately after standing, as well as after 2, 5, and 10 minutes upright. Sometimes a test called a head upright tilt table will be performed to help confirm the diagnosis.

**How Is POTS Treated?**

Patients usually are advised to increase their fluid and salt intake and

to stop medications that may be causing symptoms to worsen (Figure). In addition, patients are encouraged to build the muscular strength of the legs and abdomen by aerobic exercise and resistance training. Your doctor also may prescribe medications to help maintain your blood pressure at stable levels.

Some patients with POTS can be severely limited by the disorder. However, many patients with POTS will slowly improve over time, and the majority will respond to a combination

of hydration, reconditioning, and medication.

**Additional Resources**

- Grubb BP. *The Fainting Phenomena: Understanding Why People Faint and What to Do About It*. 2nd ed. Malden, Mass: Blackwell Publishing; 2007.
- Dysautonomia information network. Available at: <http://www.DINET.org>.
- National Dysautonomia Research Foundation. Available at: <http://www.NDRF.org>.
- Dysautonomia Youth Network of America Inc. Available at: <http://www.DYNAKIDS.org>.

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