



**SANDHILLS
CENTER**



Postural orthostatic tachycardia syndrome treatment with physical therapy

Clinical Policy ID: CCP.1484

Recent review date: 4/2021

Next review date: 8/2022

Policy contains: Postural orthostatic tachycardia syndrome.

This policy is a Sandhills Center Clinical Coverage Policy adopted from AmeriHealth Caritas of North Carolina. These clinical policies are used to assist with making coverage determinations. Sandhills Center's clinical policies are based on guidelines from established industry sources, such as the Centers for Medicare & Medicaid Services (CMS), state regulatory agencies, the American Medical Association (AMA), medical specialty professional societies, and peer-reviewed professional literature. These clinical policies along with other sources, such as plan benefits and state and federal laws and regulatory requirements, including any state- or plan-specific definition of "medically necessary," and the specific facts of the particular situation are considered by Sandhills Center when making coverage determinations. In the event of conflict between this clinical policy and plan benefits and/or state or federal laws and/or regulatory requirements, the plan benefits and/or state and federal laws and/or regulatory requirements shall control. Sandhills Center clinical policies are for informational purposes only and not intended as medical advice or to direct treatment. Physicians and other health care providers are solely responsible for the treatment decisions for their patients. Sandhills Center's clinical policies are reflective of evidence-based medicine at the time of review. As medical science evolves, Sandhills Center will update its clinical policies as necessary. Sandhills Center clinical policies are not guarantees of payment.

Coverage policy

Physical therapy for postural orthostatic tachycardia syndrome is investigational/not clinically proven and, therefore, not medically necessary.

Limitations

No limitations were identified during the writing of this policy.

Alternative covered services

Medications, often those used to control blood pressure.

Background

Postural orthostatic tachycardia syndrome is a disease marked by insufficient blood return to the heart after standing up from a lying-down position, accompanied by lightheadedness or fainting (orthostatic intolerance), along with a rapidly increasing heart rate and hypovolemia. Half of persons with the syndrome have a small fiber neuropathy which impacts the sudomotor nerves. Additional markers of the disease include physical deconditioning, reduced exercise capacity, headache, 'brain fog', dyspnea, gastrointestinal disorders, and

musculoskeletal pain. Cause(s) remain unknown, but the syndrome often follows major surgery, trauma, a viral illness, vaccination, or pregnancy (Fedorowski, 2019; Genetic and Rare Diseases Information Center, 2017).

The syndrome affects one million to three million Americans. Five of six persons with the condition are women, with the highest incidence occurring in ages 15 to 50. Diagnosis is often based on signs and symptoms, but tests such as blood pressure, heart rate (lying, sitting, and standing), and tilt table tests (the gold standard) can also be conducted (Fedorowski, 2019; Genetic and Rare Diseases Information Center, 2017).

Diagnostic criteria for postural orthostatic tachycardia syndrome include (Freeman, 2011):

- Sustained heart rate of 30 beats per minute or more (40 beats per minute in persons ages 12 – 19) within 10 minutes of standing or head-up tilt in the absence of orthostatic hypotension.
- Standing heart rate often is 120 beats per minute or more within 10 minutes of standing or head-up tilt.
- Orthostatic tachycardia may be accompanied by symptoms of cerebral hypoperfusion and autonomic overactivity that may be relieved by decumbency.
- Criteria not applicable for low resting heart rate.

Treatments for the symptoms vary, and may include increasing salt and fluids in the diet and exercising. Caregivers may prescribe medicines, often those that regulate blood pressure, along with beta blockers. Most people affected by the syndrome eventually return to normal daily activities, although some have a poor prognosis (Genetic and Rare Diseases Information Center, 2017). A survey, done two to ten years after diagnosis, of 502 patients ages 13 – 18 treated at the Mayo Clinic generated 172 responses: 19% reported complete resolution of symptoms; 51% reported persistent but improved symptoms; and 16% reported intermittent symptoms (Bhatia, 2016).

Physical therapy, typically on a graduated basis, is one means of treating the syndrome, as cardiovascular deconditioning (i.e., cardiac atrophy and hypovolemia) contributes significantly to the disorder and its symptoms (Fu, 2018). One protocol begins with a low-intensity program focused on avoiding upright positioning (rowing, swimming) with incremental progression over three months. Other interventions include physical counter maneuvers (muscle contraction, leg crossing, forward bending) (Zhao, 2020).

Dallas cardiologist Benjamin Levine contends that a specific exercise program originally designed for astronauts can remediate postural orthostatic tachycardia syndrome in other patients. The program is based on the fact astronauts, while in space for even a short time, have difficulty standing up and have high heart rates, as do persons with the syndrome. The Levine method includes semi-recumbent exercises such as rowing, swimming, and recumbent cycling (Pain, 2018).

Findings

An expert consensus statement from the Heart Rhythm Society for treating postural orthostatic tachycardia syndrome gave a weak recommendation, based on randomized trials, for a regular, structured, and progressive exercise program for patients with the syndrome. Among other treatments, the Society classified one as “weak

recommendation,” (acute intravenous infusion with saline), while the other six were “equivalent, benefits possibly exceed risks,” or “not recommended” (Sheldon, 2015).

The American College of Cardiology recommends exercise conditioning with a recumbent bike, rowing machine, or swimming, as a treatment for postural orthostatic tachycardia syndrome. The College notes that patients can exercise while avoiding the upright position to improve tolerance of the program. Dr. Levine is a study coauthor (Bryarly, 2019).

The Canadian Cardiovascular Society made a strong recommendation, based on moderate-quality evidence, supporting exercise training for persons with postural orthostatic tachycardia syndrome. The Society's panel recommends exercise take place every other day for at least 30 minutes, in a non-upright position, focusing on aerobic reconditioning with some additional leg resistance training. The panel added that some patients might not begin to experience positive results for four to six weeks (Raj, 2020).

A journal article by Mayo Clinic staff to guide clinicians treating adolescent postural orthostatic tachycardia syndrome asserts that exercise as a foundational treatment for the syndrome has "wide acceptance," but that "limited consensus" exists on specific exercise recommendations (Kizilbash, 2014).

A systematic review/meta-analysis of 25 case series (n = 755) and three randomized controlled trials (n = 103) that identifies exercise as a treatment for postural orthostatic tachycardia syndrome included just four references, only two of which published since 2005. Authors generalize evidence of efficacy as "extremely limited," due to lack of direct comparisons and heterogeneity in age, symptom severity, and efficacy measures (Wells, 2018). No other systematic review or meta-analysis addresses exercise as a treatment for this syndrome.

A review of exercise programs for postural orthostatic tachycardia syndrome states the treatment shows promise for patients whose condition otherwise does not resolve, especially those progressing from recumbent to upright activity in conjunction with core/joint stabilization and strength training. It also states that future research should better understand whether physical therapy improves exercise tolerance in these patients (Miranda, 2018).

A literature review recommends exercise and non-pharmacological interventions early in treating postural orthostatic tachycardia syndrome. Initial use of horizontal exercise is encouraged, along with supervised training to maximize functional capacity. The review lists volume expansion, reduction in venous pooling, and physical countermeasures as treatments and symptomatic relief, but their efficacy has yet to be investigated (Fu, 2018).

A group of 251 persons with postural orthostatic tachycardia syndrome began the Levine protocol, a mild-to-moderate intensity three-month endurance training program accompanied by increased salt and water intake. Only 103 subjects (41%) completed the program; another 24% reported problems in completing the program. Of those who completed three months, 71% reported significant reduction in symptoms (George, 2016).

Other studies in the medical literature addressing efficacy of exercise in treating postural orthostatic tachycardia syndrome all are small (60 subjects or fewer) and most are not randomized. A randomized controlled trial (n = 62) feasibility study, known as the PostUraL tachycardia Syndrome Exercise (PULSE) intervention, was being planned in late 2020 (McGregor, 2020).

References

On January 27, 2021, we searched PubMed and the databases of the Cochrane Library, the U.K. National Health Services Centre for Reviews and Dissemination, the Agency for Healthcare Research and Quality, and the Centers for Medicare & Medicaid Services. Search terms were “postural orthostatic tachycardia syndrome.” We

included the best available evidence according to established evidence hierarchies (typically systematic reviews, meta-analyses, and full economic analyses, where available) and professional guidelines based on such evidence and clinical expertise.

Bhatia R, Kizilbash SJ, Ahrens SP, et al. Outcomes of adolescent-onset postural orthostatic tachycardia syndrome. *J Pediatr*. 2016;173:149-153. Doi: 10.1016/j.jpeds.2016.02.035.

Bryarly M, Phillips LT, Fu Q, Vernino S, Levine BD. Postural orthostatic tachycardia syndrome: JACC focus seminar. *J Am Coll Cardiol*. 2019;73(10):1207-1228. Doi: 10.1016/j.jacc.2018.11.059.

Fedorowski A. Postural orthostatic tachycardia syndrome: Clinical presentation, aetiology and management. *J Intern Med*. 2019;285(4):352-366. Doi: 10.1111/joim.12852.

Freeman R, Wieling W, Axelrod FB, et al. Consensus statement on the definition of orthostatic hypotension, neurally mediated syncope and the postural tachycardia syndrome. *Clin Auton Res*. 2011;21(2):69–72.

Fu Q, Levine BD. Exercise and non-pharmacological treatment of POTS. *Auton Neurosci*. 2018;215:20-27. Doi: 10.1016/j.autneu.2018.07.001.

Genetic and Rare Diseases Information Center, National Institutes of Health. Postural orthostatic tachycardia syndrome. <https://rarediseases.info.nih.gov/diseases/9597/postural-orthostatic-tachycardia-syndrome>. Last updated February 1, 2017.

George SA, Bivens TB, Howden EJ, et al. The international POTS registry: Evaluating the efficacy of an exercise training intervention in a community setting. *Heart Rhythm*. 2016;13(4):943-950. Doi: 10.1016/j.hrthm.2015.12.012.

Kizilbash SJ, Ahrens SP, Bruce BK, et al. Adolescent fatigue, POTS, and recovery: A guide for clinicians. *Curr Probl Pediatr Adolesc Health Care*. 2014;44(5):108-133. Doi: 10.1016/j.cppeds.2013.12.014.

McGregor G, Hee SW, Eftekhari H, et al. Protocol for a randomised controlled feasibility trial of exercise rehabilitation for people with postural tachycardia syndrome: The PULSE study. *Pilot Feasibility Stud*. 2020;6:157. Doi: 10.1186/s40814-020-00702-1.

Miranda NA, Boris JR, Kouvel KM, Stiles L. Activity and exercise intolerance after concussion: Identification and management of postural orthostatic tachycardia syndrome. *J Neurol Phys Ther*. 2018;42(3):163–171. Doi: 10.1097/NPT.0000000000000231.

Pain C. Exercise: Treatment or Cure? PoTS UK. <https://www.potsuk.org/news/98>. Published September 8, 2018.

Raj SR, Guzman JC, Harvey P, et al. Canadian Cardiovascular Society position statement on postural orthostatic tachycardia syndrome (POTS) and related disorders of chronic orthostatic intolerance. *Can J Cardiol*. 2020;36(3):357-372. Doi: 10.1016/j.cjca.2019.12.024.

Sheldon RS, Grubb BP 2nd, Olshansky B, et al. 2015 Heart Rhythm Society expert consensus statement on the diagnosis and treatment of postural tachycardia syndrome, inappropriate sinus tachycardia, and vasovagal CCP.1484

Wells R, Elliott AD, Mahajan R, et al. Efficacy of therapies for postural tachycardia syndrome: A systematic review and meta-analysis. *Mayo Clin Proc*. 2018;93(8):1043-1053. Doi: 10.1016/j.mayocp.2018.01.025.

Zhao S, Tran VH. Postural orthostatic tachycardia syndrome. <https://www.ncbi.nlm.nih.gov/books/NBK541074/>. Last updated August 15, 2020.

Policy updates

4/2021: initial review date and clinical policy effective date: 5/2021