

POSTURAL ORTHOSTATIC TACHYCARDIA

Background

Postural orthostatic tachycardia syndrome (POTS) is a disorder of the autonomic nervous system characterized by chronic orthostatic intolerance (OI) and increased heart rate upon standing. POTS is increasingly recognized in children and adolescents with symptoms affecting their cardiovascular, neurological, and gastrointestinal health.

The pathophysiology of POTS remains relatively unknown, but some theories are linked to hypovolemia and autonomic dysfunction. The most common causes of POTS include bacterial or viral infections, Ehlers-Danlos syndrome, diabetes, and autoimmune disorders. There are several clinical forms of POTS including hypovolemic POTS, neuropathic POTS, and hyperadrenergic POTS. These subtypes are each distinguished by their major mechanisms and characteristics but are not exclusive.

Symptoms may vary and even overlap based on type and the individual's growth and development. Symptoms can range from mild to severely debilitating and include:

- Lightheadedness
- Dizziness
- Joint and muscle pain
- Fatigue
- Reduced mental and physical stamina
- General weakness
- Abdominal pain, nausea
- Headache
- Chest pain
- Difficulty thinking or concentrating
- Visual changes, blurred vision

Periods of acute exacerbations of POTS symptoms can be triggered by precipitating factors including prolonged periods of standing, exposure to heat, stress, and the start of the menstrual cycle. POTS symptoms may also worsen with a common cold or infection.

A management plan may include a combination of pharmacologic, nonpharmacologic, and lifestyle modalities.

There are currently no FDA approved medications to treat POTS alone, but medications may be prescribed to support symptom management by increasing blood volume, retaining fluids, raising blood pressure, or slowing heart rate. Medications should be strictly individualized as some may worsen symptoms or cause adverse side effects. Lifestyle or behavioral modifications including consistent exercise conditioning, compression garments, trigger avoidance (e.g., extreme temperatures, stress) and diet have been recommended. Physical countermeasure maneuvers are simple movements that can be done while seated or standing to reduce symptoms. Squatting, leg crossing, muscle pumping, and muscle tensing like “heel pumps” can help increase orthostatic tolerance. Increasing both fluid and salt intake have been recommended to increase blood volume and prevent drops in blood pressure. Eating smaller, more frequent meals may also help reduce any drops in blood pressure.

Top Takeaways for School Considerations

Postural orthostatic tachycardia syndrome (POTS) is an autonomic disorder causing symptoms like lightheadedness, dizziness, fast heart rate and fatigue upon standing.

Individuals with POTS are encouraged to sit or lie down immediately if they feel faint, dizzy, or lightheaded. Symptoms of acute exacerbation are generally not considered a medical emergency.

Increasing both fluid and salt intake are recommended to reduce symptoms. Students with POTS should be permitted to carry a water bottle, have access to appropriate snacks (e.g., water, sports drinks, salty crackers), and carry a bathroom pass.

Students should avoid prolonged periods of standing. Consider times like lunch line, fire drills, bus line up, etc. Allow the student to sit down, recline, or elevate legs when possible or per symptoms.

Many students with POTS do not function well in the morning and scheduling flexibility or adjusted school day may be beneficial.

Kennedy Krieger Institute's Specialized Health Needs Interagency Collaboration

The Specialized Health Needs Interagency Collaboration (SHNIC) program is a collaborative partnership between Kennedy Krieger Institute and the Maryland State Department of Education.



Considerations for the Individualized Healthcare Plan (IHP)

- Nursing diagnosis of reduced cardiac output, risk for unstable blood pressure, fatigue, impaired thought process
- Current diagnosed health condition including date of diagnosis, progress of disease process and other chronic health conditions
- Current medication and treatment orders (consider schedule, equipment needs and side effects)
- Nutrition interventions and equipment needs (consider fluid and salt intake recommendations, suggested snacks, salt supplements, etc.)
- Student-specific triggers, avoidance, or intervention strategies
- Use of specialized equipment, adaptive equipment, and orthotics
- Activity, positioning, transferring (consider precautions and/or restrictions)
- Consider emergency care plan(s) (ECP) and emergency evacuation plan(s) (EEP) as related to medical needs in the school setting, and staff education/training, as appropriate

Discussion Starters for Educational Team

1. Would the student benefit from evaluations or assessments in any of the following areas: physical therapy, occupational therapy, speech and language therapy, assistive technology, adapted physical education, functional behavior, psychology, hearing and vision?
2. Would the student benefit from additional academic support and/or modified education (e.g., copies of notes, extra time, reduced workload, simplified instructions, alternative formats for presentation of material, 504/IEP)?
3. Would schedule flexibility support the student?
4. Does the student require activity precautions to prevent injury?
5. Can rest breaks, safe spaces or reduced stimulation times be built into the student's schedule?

Resources

Kennedy Krieger Institute: Pediatric Postural Orthostatic Tachycardia Syndrome Clinic
kennedykrieger.org

Dysautonomia Support Network
dysautonomiasupport.org/

Standing Up to POTS
standinguptopots.org/



Scan QR code or visit **KennedyKrieger.org/Redirect** for more information.