

Managing Postural Orthostatic Tachycardia Syndrome (POTS): Essential Knowledge for Pediatric Dentists

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ABSTRACT

Postural Orthostatic Tachycardia Syndrome (POTS) is a chronic autonomic disorder characterized by excessive heart rate increase upon standing, most often in adolescent females. Common symptoms include lightheadedness, fatigue, palpitations, and syncope¹. Although well described in medical literature, practical guidance for dental teams, particularly in pediatric settings, remains limited.

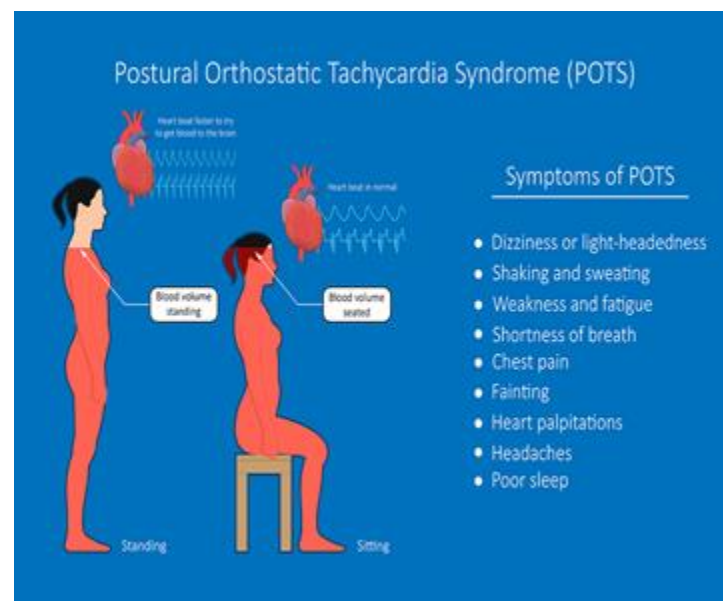
The objective of this literature review was to evaluate current evidence and translate findings into chairside, team-based strategies for safe, patient centered pediatric dental care.

Across case reports and observational studies, POTS diagnosis is supported by orthostatic tachycardia, occasional elevated norepinephrine, and reduced heart rate variability. Management varies including hydration, salt repletion, compression, graded exercise, pharmacotherapy such as ivabradine in selected cases. Evidence suggests POTS after COVID-19 vaccination is reported but less likely than after SARS-Co-V-2 infection.

As pediatric dentists and general practitioners encounter the affected demographic, education of dentists regarding clinical features of this diagnosis, risk of syncope along with clinical management are vital to positive clinical outcomes.

SYNDROME OVERVIEW

Postural Orthostatic Tachycardia Syndrome (POTS) is defined by a sustained rise in heart rate of ≥ 30 beats per minute (≥ 40 bpm in adolescents) within 10 minutes of standing, accompanied by symptoms that worsen upright and improve when supine². It most commonly affects adolescent and young adult females and presents with lightheadedness, palpitations, fatigue, weakness, and occasionally syncope, often leading to notable functional impairment¹. The pathophysiology is multifactorial and not fully understood³. In some patients, POTS may develop following physiological stressors such as surgery, trauma, or viral illnesses, and more recent evidence suggests a link between POTS and post-acute sequelae of COVID-19, potentially involving endothelial dysfunction and a prothrombotic or inflammatory state⁴. Although not typically life-threatening, POTS can significantly impact quality of life, and management is largely supportive, focusing on lifestyle modifications, pharmacologic interventions, and special considerations during medical and dental care due to potential hemodynamic instability and heightened autonomic responses^{1,3}.



CLINICAL FEATURE	REPORTED FREQUENCY (PERCENTAGE OF SUBJECTS)
Lightheadedness/Dizziness	77-100
Fatigue/Weakness	67-94
Palpitations	39-89
Exercise Intolerance	81-83
Tremulousness	50-80
Photosensitivity	78
Shortness of Breath	42-77
Disequilibrium	75
Nausea	50-72
Pallor	71
Clamminess	56-70
Anxiety	56-69
Visual Disturbances	53-61
Chest Discomfort	61
Syncope/Near Syncope	55-56
Flushing	44
Headaches	44

<https://www.yorkrehabclinic.ca/blog/postural-orthostatic-tachycardia-syndrome-pots/>

Clinical Presentation

- Symptoms are variable and unpredictable
- Dizziness, palpitations, fatigue, syncope
- Key triggers:
- Dehydration
 - Stress and anxiety
 - Prolonged upright positioning

LITERATURE REVIEW

Pharmacologic & Systemic Considerations

- POTS treatment targets:
- Hypovolemia
 - Autonomic dysfunction
 - Vascular dysregulation

- Common medications:
- Beta-blockers, ivabradine, midodrine, fludrocortisone

- Emerging literature (post-COVID POTS):
- Anticoagulation therapy reported in select cases
 - Raises concerns for bleeding risk during invasive dental procedures

- Dental implications:
- Altered heart rate and blood pressure responses
 - Medication-related xerostomia → increased caries risk

Dental & Surgical Considerations

- Orthostatic Intolerance
- Avoid rapid chair position changes
 - Gradual transitions from supine to upright reduce tachycardia and syncope risk

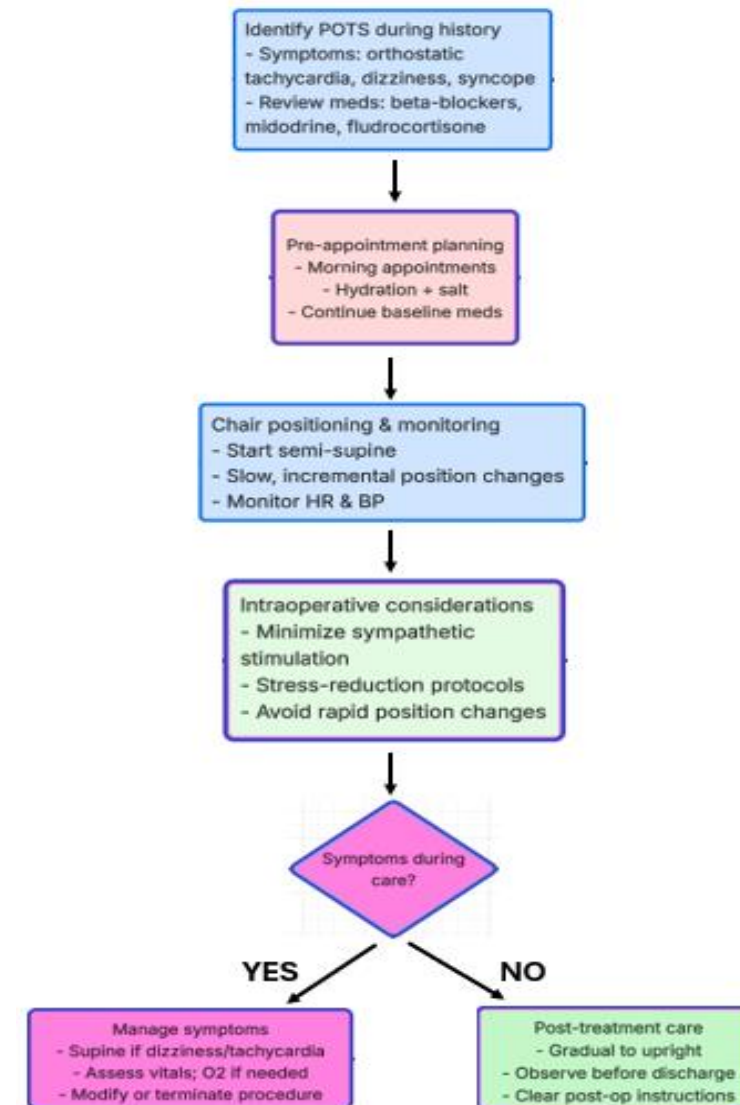
- Stress & Anxiety
- Dental anxiety and invasive procedures may exacerbate autonomic instability
 - Use stress-reduction protocols and consider shorter appointments

- Medical History Review
- Common medications: beta-blockers, fludrocortisone, midodrine
 - Medication effects may alter heart rate and blood pressure

- Interdisciplinary Care
- Physician consultation for patients requiring sedation or GA

ALGORITHM FOR DENTAL MANAGEMENT:

- Encourage hydration prior to appointments
 - Schedule short, morning visits
 - Use behavioral guidance to minimize anxiety
 - Maintain vigilance for sudden symptom onset
- Emergency preparedness and staff training are essential



DISCUSSION

The literature consistently emphasizes the importance of a comprehensive medical history when managing dental patients with Postural Orthostatic Tachycardia Syndrome (POTS). Key history elements include symptom severity, triggers, and prior syncopal events. Medication review is essential, as commonly prescribed agents—such as beta-blockers, fludrocortisone, midodrine, and ivabradine—can affect heart rate, blood pressure regulation, and salivary function, with implications for procedural safety and long-term oral health.

Frequently reported comorbidities, including Ehlers-Danlos syndrome, chronic fatigue syndrome, migraine, and post-viral dysautonomia, further inform dental risk assessment particularly regarding tissue fragility, fatigue tolerance, and pain perception.

Comorbidities Associated with POTS^{2,4}

POTS frequently coexists with multisystem comorbidities that influence dental management. Commonly reported conditions include:

- Ehlers-Danlos syndrome (EDS): joint hypermobility, tissue fragility, TMJ instability
- Chronic fatigue syndrome: reduced tolerance for prolonged appointments
- Migraine disorders: heightened sensitivity to stress, dehydration, and sensory stimuli
- Post-viral / post-COVID dysautonomia: increased symptom burden and medical complexity

Additional reported associations:

- Gastrointestinal dysmotility, anxiety disorders, mast cell activation, autoimmune conditions

Recognition of comorbidities supports:

- Individualized risk assessment
- Modified positioning and appointment length
- Interdisciplinary coordination to optimize patient safety

Management of patients with POTS requires interdisciplinary collaboration among dental providers, physicians, and when appropriate anesthesia teams, to ensure medical stability, mitigate autonomic risk, and safely individualize treatment planning across care settings. It is critical for dental providers to accurately assess at-risk patients to determine individualized management plans and ensure staff are aware of possible symptomatology.

CONCLUSIONS

Management of pediatric patients with Postural Orthostatic Tachycardia Syndrome (POTS) requires an individualized and precaution-focused approach in the dental setting. As dentists increasingly encounter this patient population, a strong understanding of the condition's clinical features, risk of syncope, and appropriate management strategies is essential to achieving safe and positive clinical outcomes.

Key strategies include slow chair positioning, stress-reduction techniques, and careful monitoring to prevent symptom exacerbation. Awareness of pharmacologic therapies and their potential oral and systemic effects is critical, particularly when planning invasive procedures.

Given the limited pediatric dental-specific evidence, current recommendations are largely extrapolated from adult data and interdisciplinary guidelines, reinforcing the importance of collaboration with medical providers. Continued research is needed to develop standardized, evidence-based protocols for this medically complex population.

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