



Exercise Physiology for POTS & Dysautonomia in Long COVID

Caelum Schild, ESSAM, AEP

Accredited Exercise Physiologist – Specialising in
POTS, ME/CFS and other “invisible illnesses”

Partner, Lofty Health & Wellness



Background

- First became interested in working with dysautonomia and fatigue conditions after having personal experience with orthostatic intolerance and fatigue myself starting about 15 years ago.
- Able to adapt my personal experience, the evolving evidence base and clinical EP knowledge to gradually start helping more people with these conditions about 10 years ago.
- Started Lofty Health & Wellness in early 2022 so that I can solely help people with “invisible illnesses”.
- My role as an Exercise Physiologist is quite different to how people typically view it:
 - Lifestyle modifications – electrolyte, fluid, compression, body positioning and ADL assistance.
 - Education and strategies – ANS, vagus nerve, HRV, pacing, setback planning and trigger identification.
 - Movement, activity and structured exercise.

Screening and diagnosis

- With post-COVID POTS we have seen time to diagnosis reduce – more timely access to treatment and management:
 - E.g. A 2013 report by Dysautonomia International – average diagnostic delay of 5 years, 11 months.
- Screening is important to ensure absence of other pathology.
- Since early 2022, our clinic (Adelaide) has observed some people still presenting prior to official diagnosis:
 - Primarily fatigue and orthostatic intolerance symptoms.

Where to start

- Identify symptoms that are limiting your function the most to focus on appropriate care, thereby having the greatest impact on:
 - Function.
 - Activities of daily living (ADLs).
 - Quality of life (QoL).
- Identify factors which make your symptoms better or worse:
 - Better – e.g. Salt / electrolytes / water, compression, lying down.
 - Worse – e.g. Heat, shower, stress, upright exercise, standing stationary.

How movement/exercise helps POTS

- In patients with POTS, exercise with an appropriate movement program has been demonstrated to:
 - Increase physical fitness (increased VO2 max).
 - Improve how much blood returns to fill the heart (end-diastolic volume).
 - Improve how much blood the heart pumps out when it beats (stroke volume).
 - Increase the amount of blood circulating in the body (blood volume).
 - Increase the size of the part of the heart which pumps blood to the body (left ventricular mass).
 - Improve the “balance” between the sympathetic, fight-flight response and parasympathetic, rest-digest response (autonomic circulatory control and arterial cardiac baroreflex function).

Movement and exercise PLUS...

- 1st step is to identify what level of movement can be performed with minimal:
 - Intra-session symptom exacerbation (VAS, RPE, SpO2 and HR as guides), **or**
 - Post-exertional malaise (PEM, also referred to as post-exertional symptom exacerbation).
 - Long term aim – facilitate self-management and self-regulation of movement.
- Best achieved by learned experience of movement, plus management strategies and education about:
 - Physiology (how the body works).
 - Autonomic nervous system, vagus nerve function and heart rate variability (HRV).
 - HRV Biofeedback.
 - Pacing and trigger identification.
 - Setback planning.
 - Troubleshooting.



Visual Analogue Scale (VAS)

Before starting exercise – ask yourself:
1. What is my “most limiting symptom” today?
2. Pick a number below to indicate how bad your “most limiting symptom” is currently.
3. If your “most limiting symptom” changes by 3 points – STOP.

0	1	2	3	4	5	6	7	8	9	10
No issues		Mild		Discomforting		Distressing		Horrible		Unbearable

Borg’s Rating of Perceived Exertion (RPE)

0	No exertion at all
1	Very easy
2	Somewhat easy
3	Moderate
4	Somewhat hard
5	Hard
6	
7	Very hard
8	
9	
10	Very, very hard

Levels of movement and exercise

- The amount and type of movement is individual to you.
- The aim is to allow a level of physical exertion, without triggering "inappropriate" orthostatic response or PEM.



1

Countermeasures
and spending more
time upright



2

Supine or lying
down forms of
exercise



3

Recumbent or
seated forms of
exercise



4

Upright forms of
exercise (in
combination w recum)



5

Upright forms of
exercise with some
higher intensity

Levels of movement and exercise

- The amount and type of movement is individual to you.
- The aim is to allow a level of physical exertion, without triggering "inappropriate" orthostatic response or PEM.



1

Countermeasures
and spending more
time upright



Levels of movement and exercise

- The amount and type of movement is individual to you.
- The aim is to allow a level of physical exertion, without triggering "inappropriate" orthostatic response or PEM.



2

Supine or lying
down forms of
exercise



Levels of movement and exercise

- The amount and type of movement is individual to you.
- The aim is to allow a level of physical exertion, without triggering "inappropriate" orthostatic response or PEM.



3

Recumbent or
seated forms of
exercise



Levels of movement and exercise

- The amount and type of movement is individual to you.
- The aim is to allow a level of physical exertion, without triggering "inappropriate" orthostatic response or PEM.



4

Upright forms of
exercise (in
combination w recum)

Levels of movement and exercise

- The amount and type of movement is individual to you.
- The aim is to allow a level of physical exertion, without triggering "inappropriate" orthostatic response or PEM.



5

Upright forms of
exercise with some
higher intensity

Cardio vs weights?

- These two different forms of movement/exercise help with POTS in slightly different ways.

Cardio or aerobic forms of exercise

Mostly aids with the changes in heart function and physical fitness seen in POTS patients who perform regular physical activity.

Weights or resistance forms of exercise

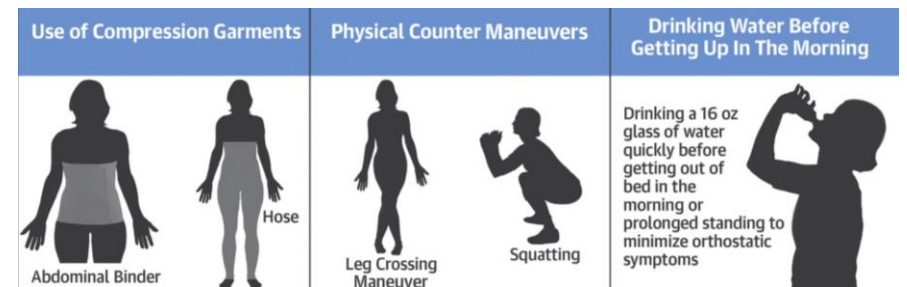
Mostly aid with the changes in skeletal muscle mass.

Stronger leg and abdominal muscles act in a similar way to compression garments, allowing better return of blood to the heart.

The stronger these muscles are, the better your “internal compression garments” work, meaning more efficient return of blood to the heart, a reduction in blood pooling and improved tolerance to upright activities.

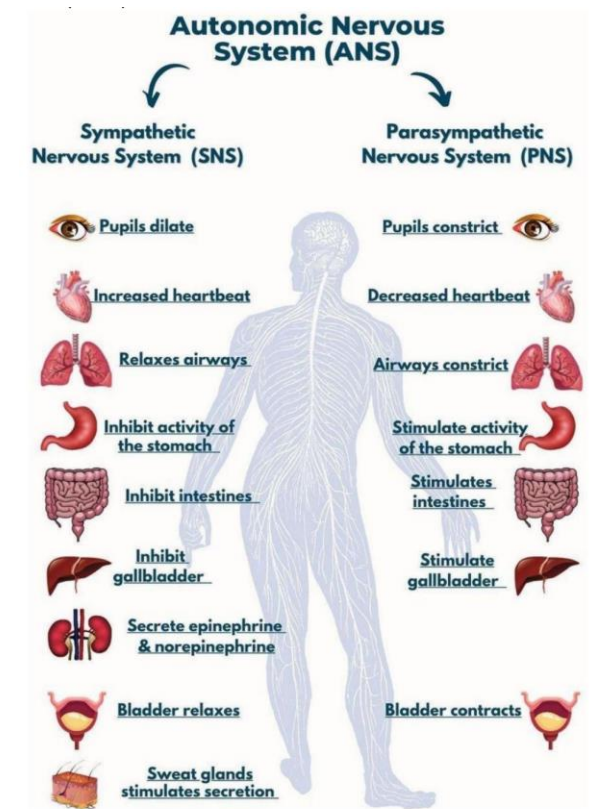
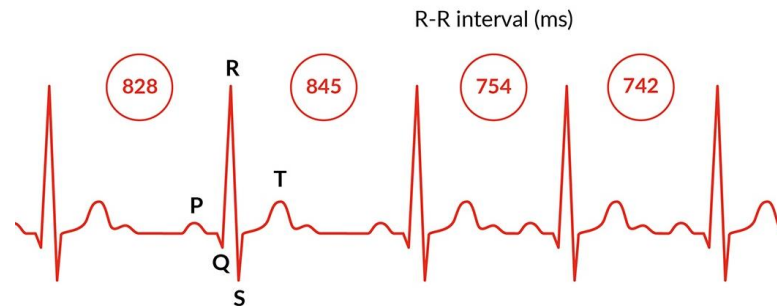
Common additional lifestyle strategies

- Very important if looking to begin movement, physical activity and exercise:
 - Salt – up to 10g (2 teaspoons) of salt per day, a container or zip lock bag can be helpful.
 - Fluids – 2-3L per day
- Compression – full leg plus abdominal is best, 20-30mmHg.
- Showering if possible in evening – avoids a potentially significant vasodilatory response first thing in the morning.

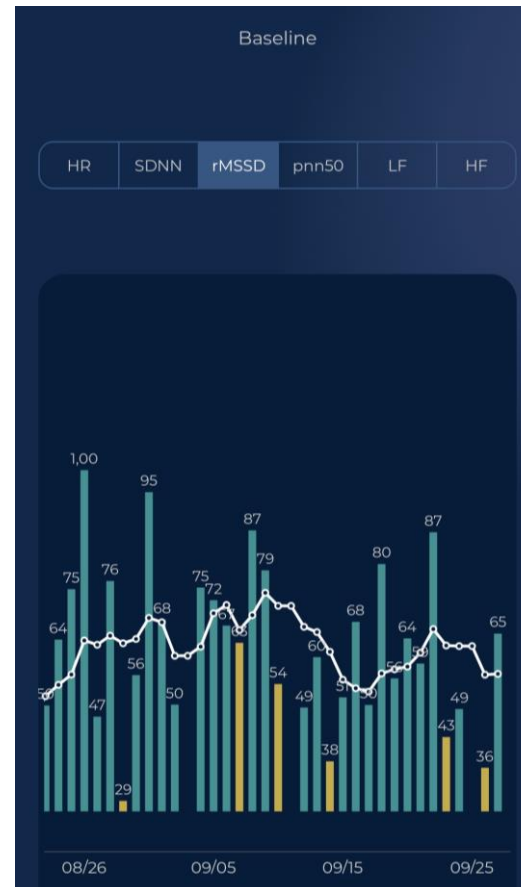


Intro to heart rate variability (HRV)

- HRV is the inter-beat variability between successive heart contractions.
- Variability in heart rate is a result of the adaptive processes of the body's response to stimuli within the body.
- Variability is good in biological systems.
- HRV is an accurate, non-invasive measure of the ANS and “autonomic balance” – the balance between the sympathetic nervous system and parasympathetic nervous system.



Intro to heart rate variability (HRV)



Intro to heart rate variability (HRV)



Heart rate variability biofeedback - something to look into if you are interested...

Additional resources



POTS UNMASKED

Adelaide 2022 

Saturday 29th October

DYSAUTONOMIA INTERNATIONAL



AWARENESS



ADVOCACY



ADVANCEMENT



POTS UK
POSTURAL TACHYCARDIA SYNDROME

Presented by – Caelum Schild, Accredited Exercise Physiologist