Irregularities with the heart in Myalgic Encephalomyelitis (ME) are well-documented in clinical and research observations, particularly when the disease is understood as a neuroimmune and cardiovascular disorder (as per Dr. Byron Hyde and the ICC 2011). These irregularities tend to reflect autonomic, vascular, and metabolic dysfunctionrather than classic structural heart disease.

Cardiac Irregularities in ME

Low Cardiac Output and Reduced Stroke Volume

* Findings: ME patients often have significantly reduced blood volume and cardiac output — the heart pumps less blood with each beat.

* Mechanism: Linked to autonomic nervous system dysfunction, impaired venous return, and hypovolemia.

* Effect: Causes fatigue, dizziness, poor perfusion, and post-exertional malaise.

Key studies:

* Peckerman et al. Am J Med Sci, 2003 — documented low cardiac output in ME/CFS patients.

* van Campen et al., 2019 — showed reduced stroke volume index during tilt testing.

Orthostatic Intolerance & Heart Rate Instability

Includes:

*Postural Orthostatic Tachycardia Syndrome (POTS)

*Neurally Mediated Hypotension (NMH)

*Orthostatic Hypotension

* Effect: On standing, blood pools in the lower body, leading to a rapid increase or drop in heart rate and blood pressure.

* Symptoms: Palpitations, chest pressure, dizziness, and near-syncope.

* Mechanism: Autonomic (vagal/sympathetic) dysfunction, often with reduced plasma volume.

* Study: Freeman & Komaroff, Clin Auton Res, 1997 — detailed orthostatic cardiovascular irregularities in ME/CFS.

Impaired Heart Rate Variability (HRV)

* Findings: Reduced HRV indicates poor parasympathetic (vagal) control and sympathetic dominance.

* Meaning: Reflects chronic autonomic imbalance and overactivation of the stress response.

* Study: Newton et al., Clin Auton Res, 2009 — found blunted HRV in ME, correlating with disease severity.

Abnormal Cardiac Energetics

* Findings: MR spectroscopy and metabolic studies show impaired myocardial energy metabolism, including reduced ATP production.

* Mechanism: Mitochondrial dysfunction and hypoperfusion of the myocardium.

* Effect: Cardiac fatigue and poor recovery after exertion.

* Study: Hollingsworth et al., NMR Biomed, 2012 — abnormalities in cardiac bioenergetics in ME/CFS.

Diastolic Dysfunction (Filling Abnormalities)

* Findings: Some patients have mild left ventricular diastolic dysfunction — the heart relaxes poorly between beats.

* Mechanism: Chronic low blood volume and reduced preload to the heart.

* Study: Hurwitz et al., Am J Med Sci, 2009 — reported left ventricular filling abnormalities in ME/CFS.

Microvascular & Endothelial Dysfunction

* Findings: Reduced capillary flow and nitric oxide regulation, leading to poor oxygen delivery to tissues.

* Mechanism: Immune activation and oxidative stress affecting endothelial cells.

* Study: Systrom et al., 2020 — invasive exercise testing showed systemic oxygen extraction defects consistent with microcirculatory impairment.

Pericarditis / Myocarditis in Some Cases

* Description: A subset of ME patients (especially after enteroviral or EBV infection) show viral myocarditis or pericarditis either acutely or chronically.

* Mechanism: Persistent viral infection or immune-mediated inflammation.

* Study: Dr. Byron Hyde (Nightingale Definition) and early ME case series — described viral cardiac inflammation in “Atypical Polio” outbreaks.

Clinical Implications

Cardiac irregularities contribute to hallmark symptoms:

* Post-exertional malaise

* Intolerance to standing

* Cold extremities

* Shortness of breath with exertion

* Fluctuating heart rate or palpitations

Many findings normalize only when the patient lies flat and rests, indicating a strong hemodynamic component.

Management & Monitoring Tips

* Orthostatic testing: Active stand or tilt table test (10–30 minutes).

* Heart rate monitoring: HR and HRV tracking (using wearables).

* Hydration & salt: Increase plasma volume if not contraindicated.

* Compression garments: Help reduce venous pooling.

* Avoid overexertion: Physical or mental — to prevent cardiac strain.

* Medical oversight: Rule out myocarditis or structural heart disease if chest pain or arrhythmia is present.

An important and very characteristic feature of Myalgic Encephalomyelitis (ME) — significant heart rate changes with even minimal movement or posture change.

Here's a detailed breakdown:

Heart Rate Changes with Minimal Movement in ME

1. Exaggerated Heart Rate Response

* Description: Even small movements — such as sitting up, reaching, brushing teeth, or talking — can cause the heart rate to jump dramatically.

* Range: In some patients, HR can increase by 30–60 beats per minute within seconds of standing or moving slightly.

* Mechanism: This is not due to deconditioning — it reflects autonomic nervous system dysregulation, especially impaired baroreflex and vagal control.

2. Physiological Mechanisms

Autonomic Dysfunction:

* Impaired parasympathetic (vagal) regulation → poor control of HR.

* Overactive sympathetic nervous system compensates, producing tachycardia.

Low Blood Volume (Hypovolemia):

* Reduced total blood and plasma volume make the heart work harder to maintain circulation.

Venous Pooling:

* Blood pools in the legs and abdomen upon standing or mild activity, lowering venous return and triggering HR increase.

Mitochondrial/Cardiac Energy Deficit:

* Reduced cardiac ATP and oxygen extraction cause compensatory HR rise to sustain oxygen delivery.

4. How It Feels to the Patient

* Rapid or pounding heartbeat with small exertions: e.g., rolling over, brushing hair, sitting up.

* Lightheadedness, chest pressure, breathlessness, or sudden exhaustion.

* Post-exertional symptom flare (PEM) following minimal activity.

* Sometimes accompanied by cold hands/feet, pale or flushed face, and trembling.

5. Monitoring & Objective Testing

* Active Stand Test: Measure HR and BP lying down, then at 1, 3, then 5, and 10 minutes standing.

* Tilt Table Test: The gold standard for diagnosing orthostatic disorders.

* Wearable HR Monitors: Devices like Polar, Garmin, or Fitbit can show HR surges with minimal movement, confirming autonomic instability.

Medications sometimes prescribed for heart rate and cardiovascular irregularities in Myalgic Encephalomyelitis (ME) — particularly those related to orthostatic intolerance (OI), tachycardia, and autonomic instability. Important: Treatment must be individualized and prescribed only under a physician familiar with ME and autonomic disorders, as responses vary greatly and side effects can be amplified in ME due to metabolic and autonomic sensitivity.

When Heart Rate Changes Are Secondary to Crashes

During a crash, the autonomic system becomes unstable:

* HR may fluctuate between bradycardia (slow) and tachycardia (fast).

* Drug therapy is often avoided during a crash unless essential — focus is on strict rest, hydration, and lying flat.

* Symptom monitoring (e.g., HR monitor or tilt test) helps determine if medication is warranted later.

Management Strategies

* Pacing: Avoid triggers; rest before symptoms escalate.

* Increase fluids and salt (if not contraindicated) to expand blood volume.

* Compression stockings or abdominal binders to prevent blood pooling.

* Recumbent activity only (stretching, reading, or gentle movement while lying flat).

* Beta-blockers, ivabradine, or low-dose fludrocortisone may be prescribed by a physician if tachycardia is severe.

* Temperature regulation: Avoid heat, which worsens vasodilation and HR changes.

https://pmc.ncbi.nlm.nih.gov/articles/PMC10027292/

https://www.sciencedirect.com/.../pii/S0735109721055893

https://www.jwatch.org/.../association-between-me-cfs-and...

#NightingaleContinuum