



HSE
Occupational Health & Safety
and Environmental Protection unit

Stress & Cardiovascular diseases

Katia Schenkel & Sébastien Tubau, Psychologists

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Medical Service

Présentation



Katia Schenkel
Sébastien Tubau

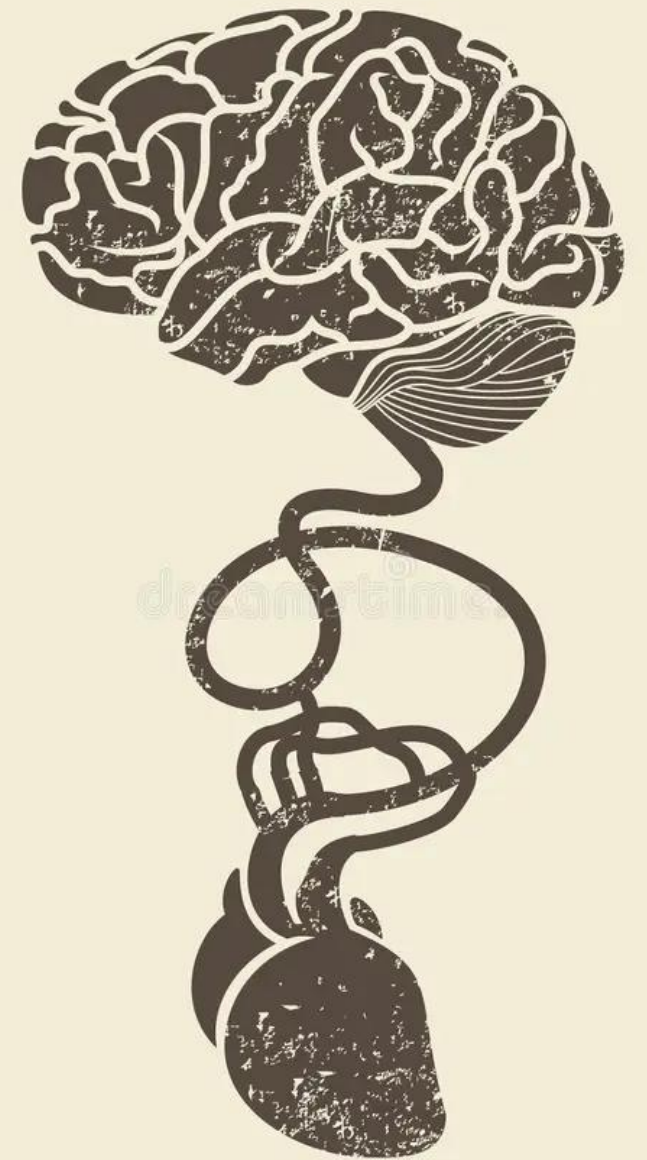
Psychologists (FR / EN)

Medical Service

Psychologist.medical.service@cern.ch

Program

1. Stress as a Risk Factor
2. What is stress ?
3. Stress physiology
4. Prevention tools

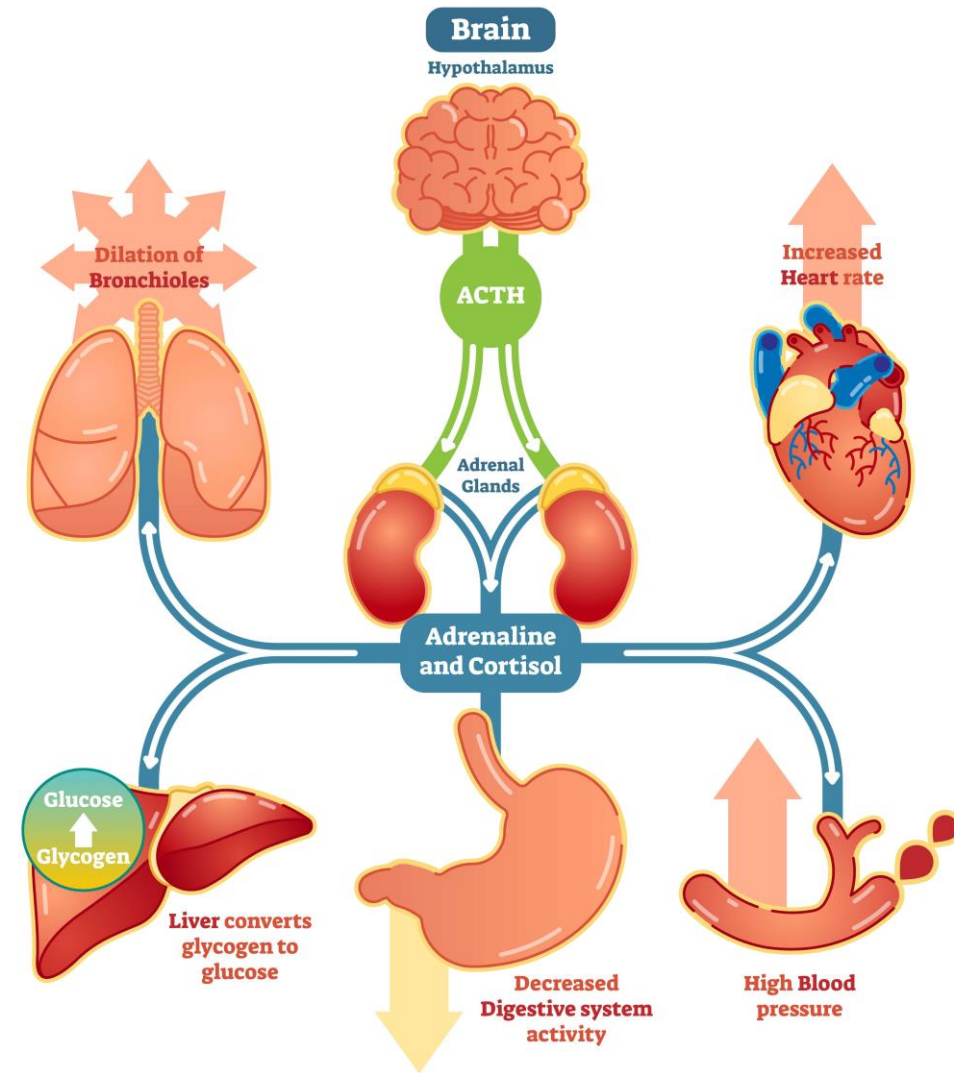


Stress as a risk factor for cardiovascular diseases

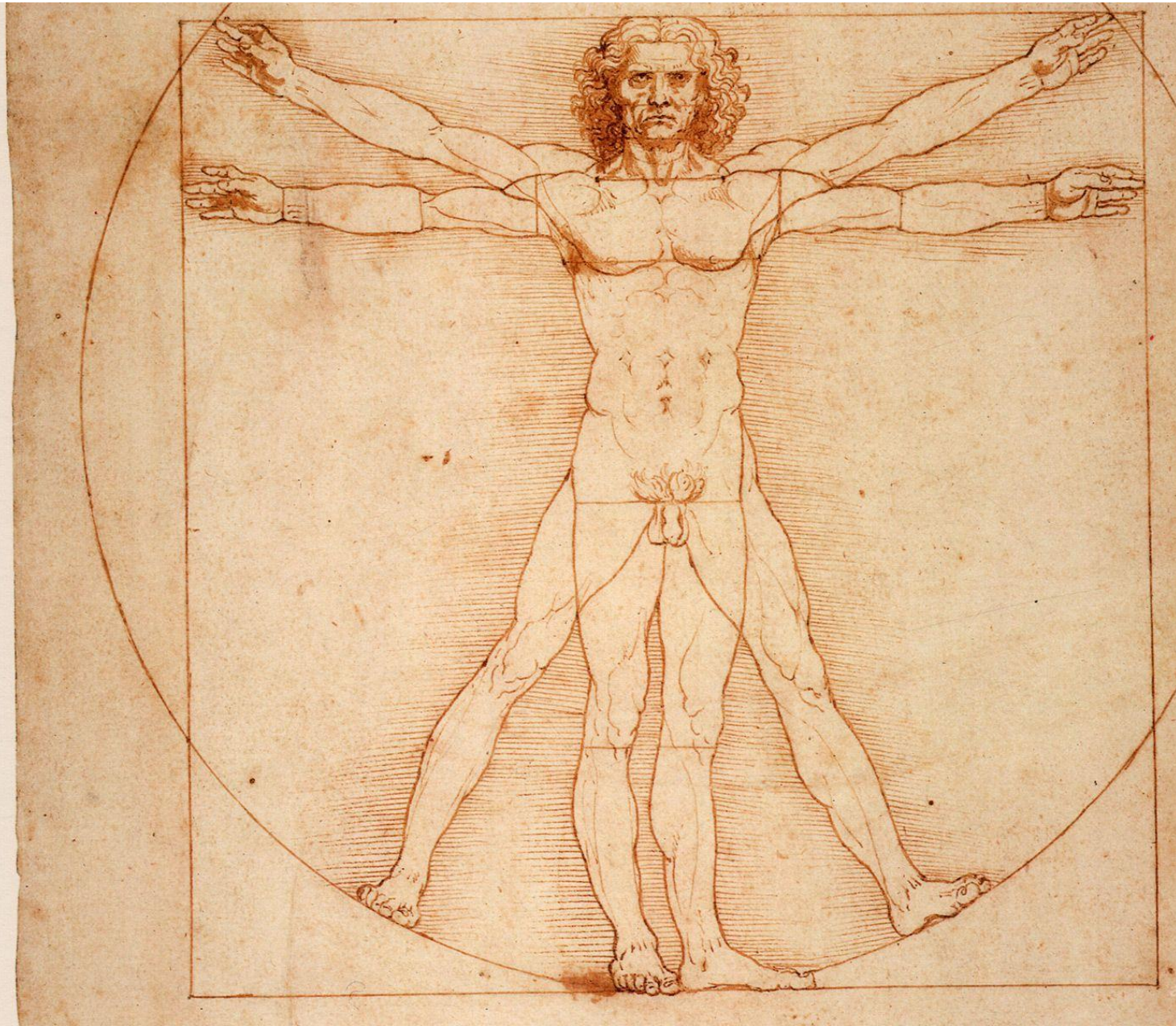
- Stress, whether chronic or acute, can have detrimental effects on the cardiovascular system.
- The body's response to stress, known as the "fight-or-flight" response, involves the release of stress hormones like cortisol and adrenaline.
- These hormones can lead to increased heart rate and blood pressure, among other physiological changes, which, if prolonged, can contribute to the development and progression of cardiovascular diseases.

Stress as a risk factor for cardiovascular diseases

STRESS RESPONSE SYSTEM



Physiology of stress



Scientific evidence

Numerous studies have investigated the relationship between stress and cardiovascular diseases, providing robust evidence of this connection.



Scientific evidence – Key Findings

1. Long-term Stress Increases Risk:

Studies consistently show that individuals experiencing chronic stress over extended periods face a significantly higher risk of developing heart diseases compared to those with lower stress levels.

2. Mechanisms of Action:

Research has uncovered the specific mechanisms through which stress contributes to cardiovascular risk, including inflammation, endothelial dysfunction, and the promotion of unhealthy behaviors such as overeating and smoking.

Scientific evidence – Key Findings

3. Vulnerable Populations:

Certain populations, such as individuals with preexisting heart conditions, may be more vulnerable to the adverse effects of stress, making stress management even more critical for them.

4. Stress Reduction Benefits:

Studies also reveal that stress reduction techniques, such as meditation and exercise, can have a positive impact on cardiovascular health, further supporting the link between stress and heart disease.

Scientific evidence – Impact on physiology

1. High blood pressure:

Prolonged stress can cause a persistent rise in blood pressure, a major risk factor for cardiovascular disease. Excess stress can stimulate the sympathetic nervous system, which increases heart rate and contractility, as well as the resistance of blood vessels, thus contributing to hypertension.

2. Inflammation:

Chronic stress can trigger an inflammatory response in the body. Inflammation is a key factor in the formation of atherosclerotic plaques in the arteries, which can lead to strokes and heart attacks.



Scientific evidence – Impact on physiology

3. Behavioural patterns:

Stress can also lead to unhealthy behaviours such as overeating, excessive alcohol consumption and smoking, all of which are major risk factors for cardiovascular disease.

4. Heart Rate Variability (HRV):

Stress can disrupt heart rate variability, an indicator of cardiovascular health. Reduced heart rate variability is associated with an increased risk of heart disease.

5. Blood clotting:

Stress can also encourage excessive blood clotting, which can increase the risk of potentially fatal blood clots.

Scientific evidence – Underlying mechanisms

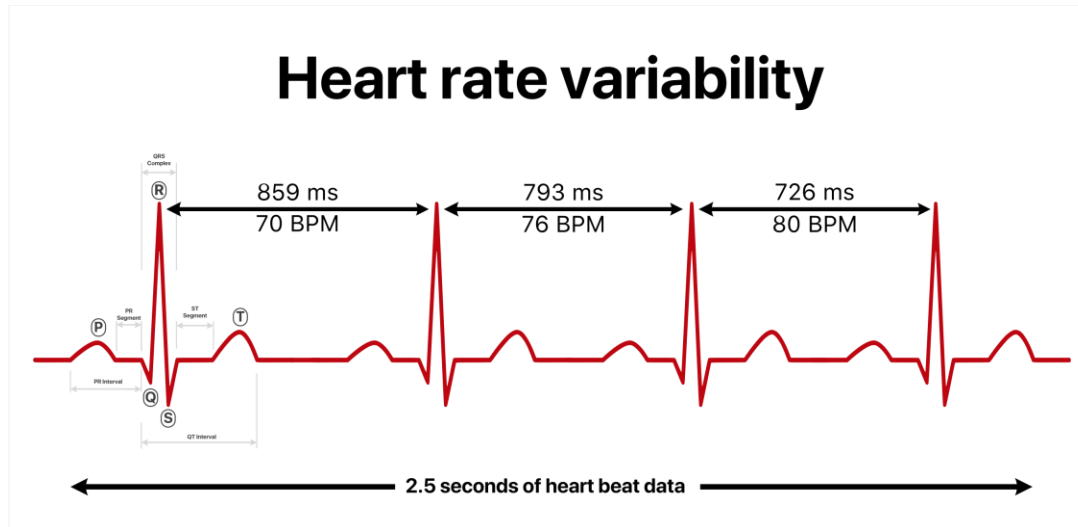
Cortisol, often referred to as the stress hormone, plays a key role. In excess, it can raise blood pressure, increase blood sugar levels and promote the accumulation of abdominal fat, all of which are risk factors for heart disease.

The response to chronic stress can also promote the accumulation of **fat in the arteries**, reduce the production of **nitric oxide** (which helps dilate blood vessels), and alter the function of **endothelial cells**, which line the inside of blood vessels.

Prevention Tools



Improving Heart Rate Variability (HRV)



- Heart rate variability (HRV) is the physiological phenomenon of variation in the time interval between heartbeats. It is measured by the variation in the beat-to-beat interval.

Improving Heart Rate Variability (HRV)

- A high HRV is generally considered to be a sign of good heart health, while a low HRV is associated with an increased risk of cardiovascular disease (cardiac arrhythmias, heart failure and atherosclerosis).
- HRV is influenced by the autonomic nervous system, which regulates the body's automatic functions, including heart rate.
- A balanced HRV indicates a better ability of the cardiovascular system to adapt to change and stress.

Improving Heart Rate Variability (HRV)

Several studies have shown that chronic or persistent stress can lead to a reduction in FVC, which increases the risk of cardiovascular disease.

Stress management using relaxation, meditation or biofeedback techniques can improve heart rate and potentially reduce the risk of heart problems.

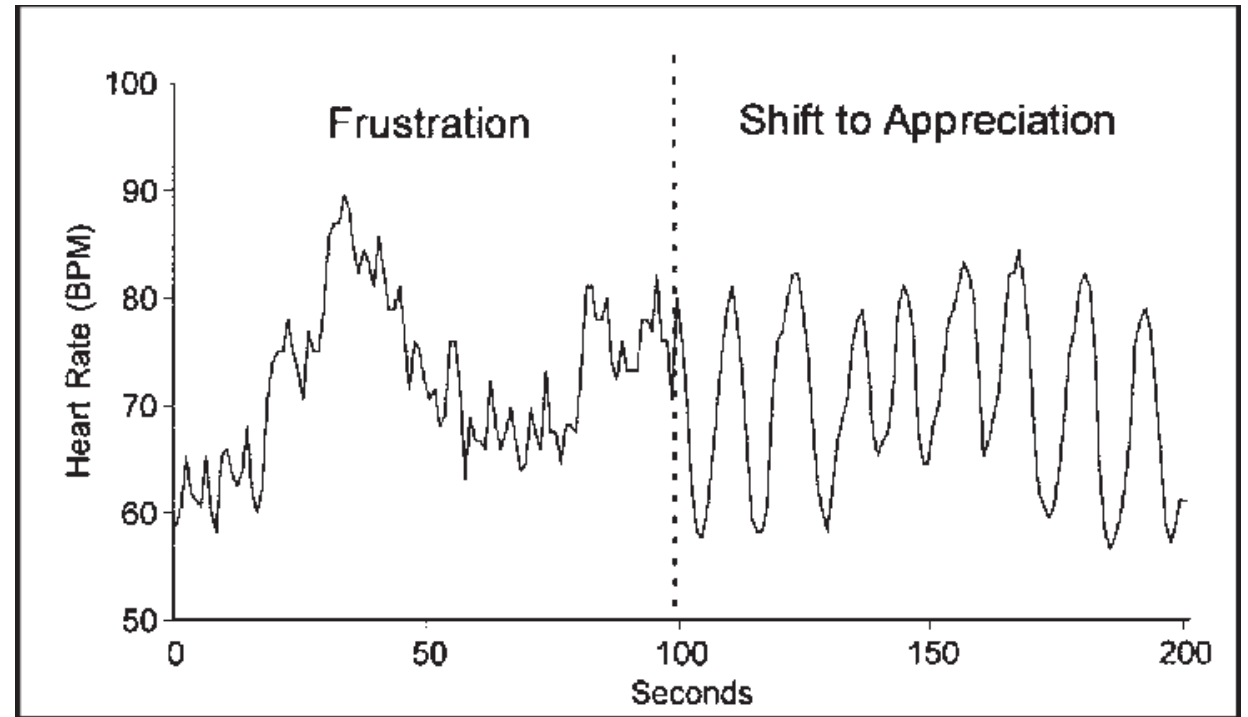
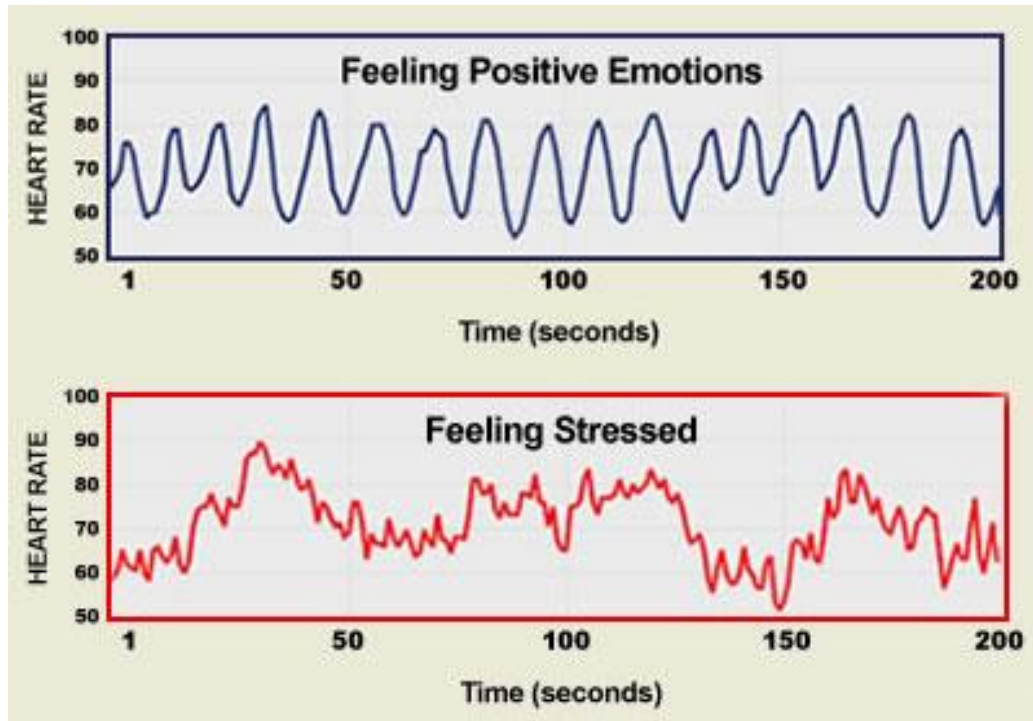
Psychological aspects of HRV

Emotions such as fear, anger and anxiety generally trigger a stress response, which involves an increase in sympathetic nervous system (SNS) activity.

This response leads to an increase in heart rate and a reduction in HRV, as the heart rate becomes more regular.

This reduction in heart rate is a sign that the cardiac system is adapting to the immediate demands, but if it persists over the long term, it can be detrimental to heart health.

Psychological aspects of HRV



A simple and effective technic : Cardiac Coherence

Step 1

Slow down your breath (4-6 seconds inhaling and 4-6 seconds exhaling)

Step 2

Focus your attention in the area of the heart

Step 3

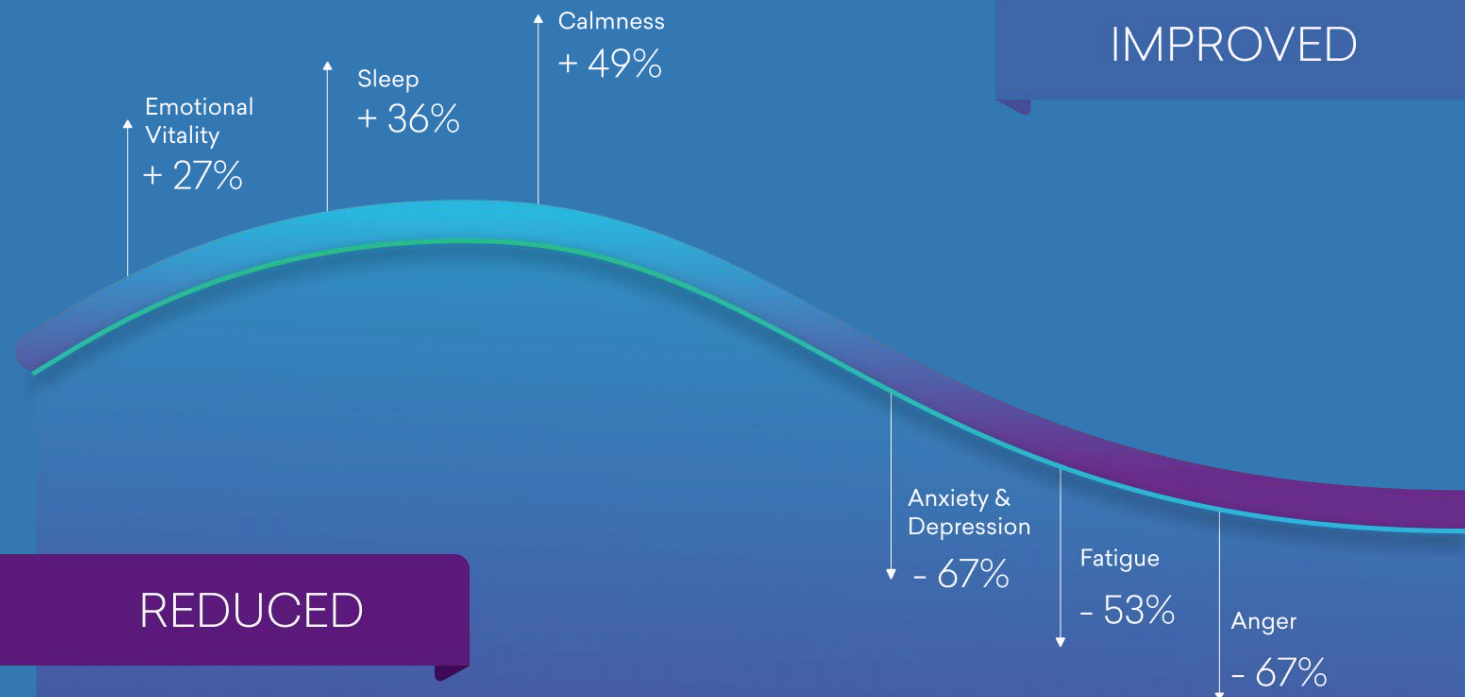
Activate a positive feeling

A simple and effective technic : Cardiac Coherence

Studies suggest that cardiac coherence can play a positive role in the prevention of cardiovascular disease by improving:

- HRV
- Reducing blood pressure
- Reducing inflammation
- Promoting better stress management.

A simple and effective technic : Cardiac Coherence



Studies conducted with over 14,000 people have shown improvements in mental & emotional well-being in just 6-9 weeks



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