

# Pranayama

Teachers Training

Level 1 2023

HRV - Heart Rate Variability



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श्री गुरुभ्यो नमः हरिः ॐ

Om Om Om

Sri Gurubhyo Namah Harih Om

Salutations to the Gurus!

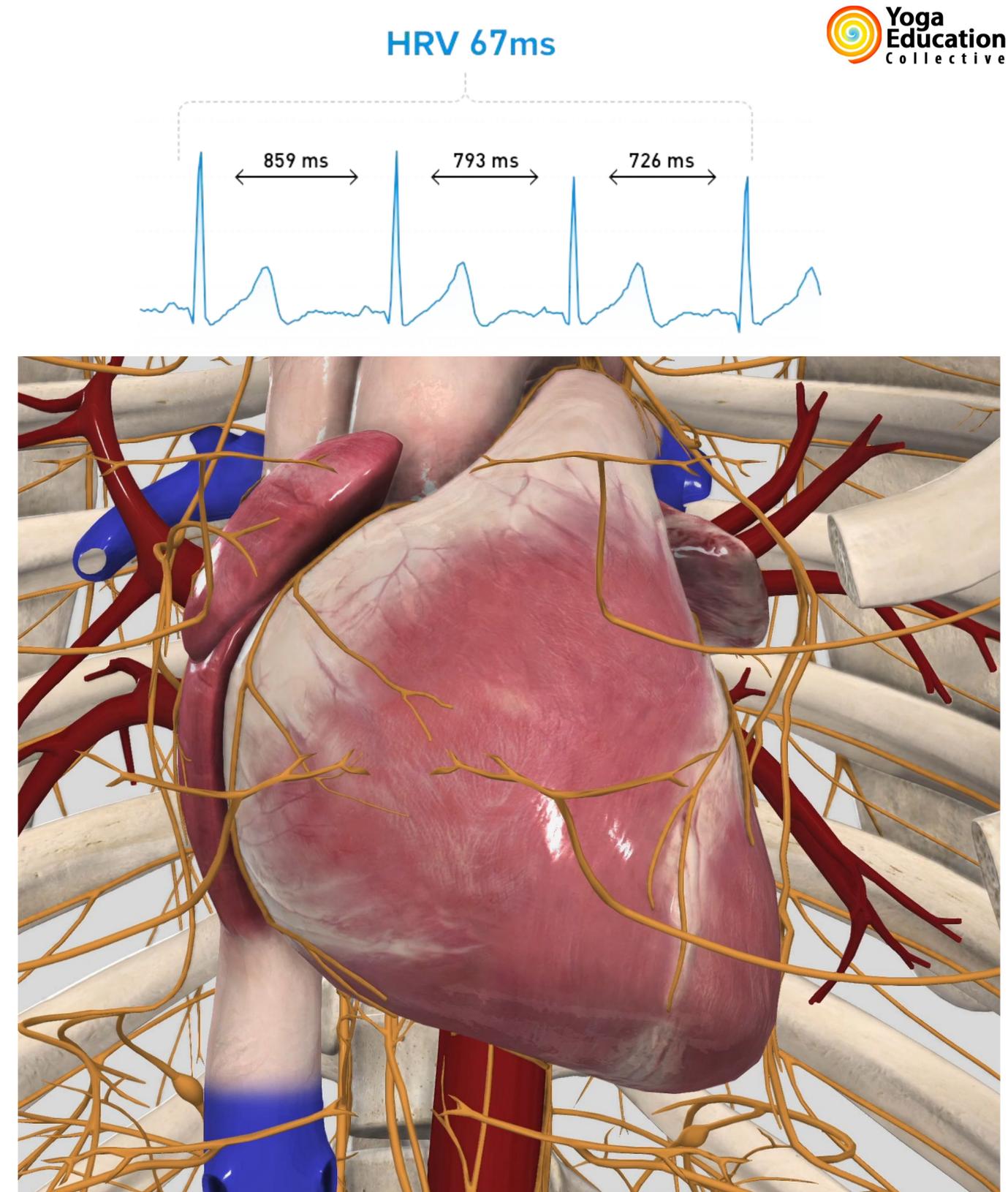
ॐ सह नाववतु ।  
सह नौ भुनक्तु ।  
सह वीर्यं करवावहै ।  
तेजस्वि नावधीतमस्तु मा विद्विषावहै ।  
ॐ शान्तिः शान्तिः शान्तिः ॥

oṃ saha nāvavatu saha nau bhunaktu  
saha vīryaṃ karavāvahai  
tejasvi nāvadhītam astu mā vidviṣāvahai  
oṃ śāntiḥ śāntiḥ śāntiḥ

May that Brahman protect us together. May it nourish us together. May we both gain great vitality. May our learning be brilliant. May we never argue. Om peace, peace, peace.

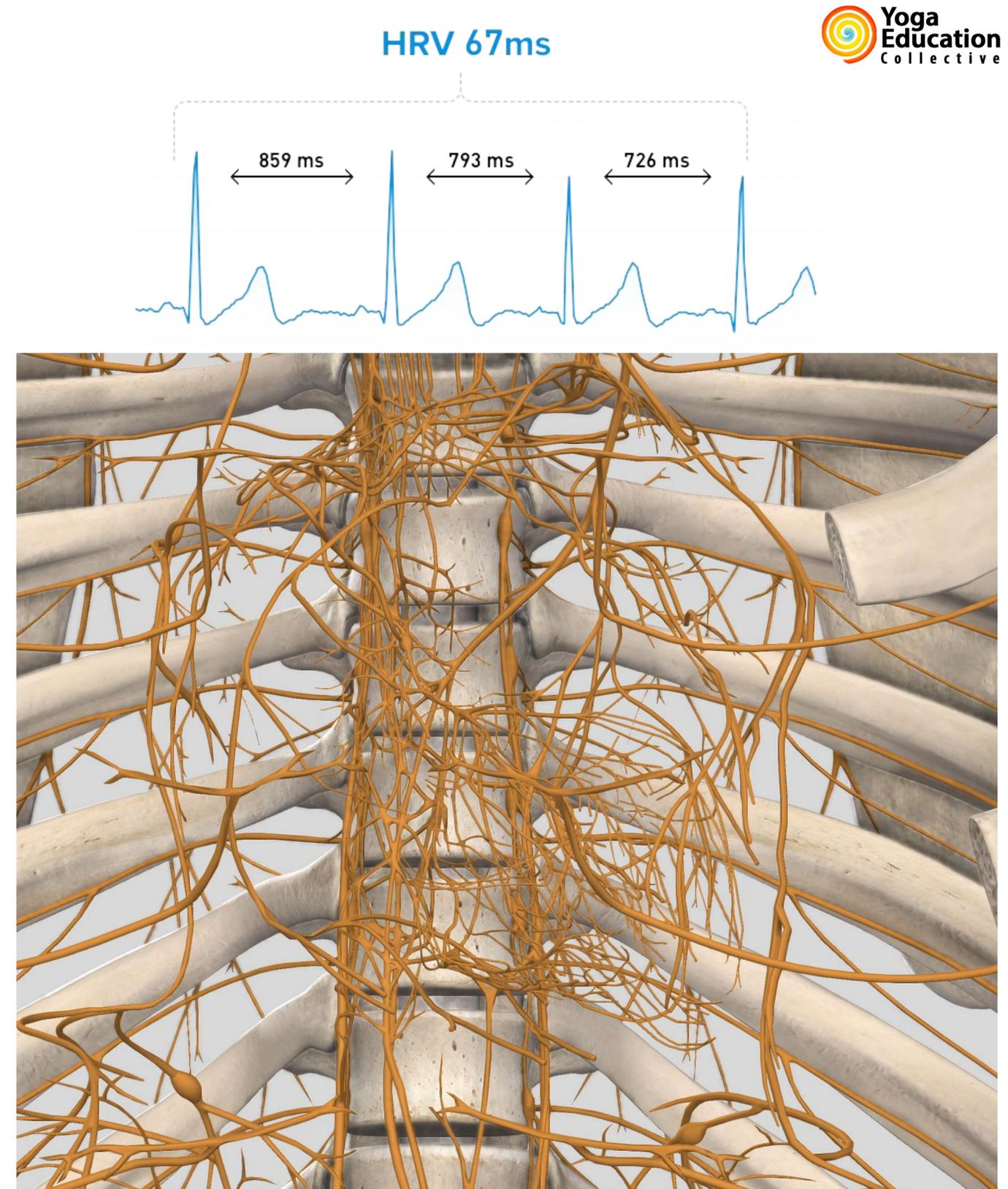
# Heart Rate Variability – HRV

1. HRV is the physiological variation in the time interval between heartbeats
2. It is measured by the variation in the beat-to-beat interval



# Heart Rate Variability – HRV

1. HRV is an accurate measure of the ANS (Autonomic Nervous System)
2. As such it is a biomarker of one's overall health and well being



# Heart Rate Variability - HRV

From: *One Simple Thing: A New Look at the Science of Yoga and How It Can Transform Your Life* by Eddie Stern

- Heart rate variability is the beat-to-beat difference in our heart rate.
- It serves as a reliable measure of the proper functioning of the autonomic nervous system.
- When we inhale, our heartbeat speeds up, and when we exhale, the heartbeat slows down.
- This shows that the vagal brake is slowing the heart on the exhalation, and releasing on the inhalation, allowing more blood to move through the heart and increasing the level of oxygenation of the blood via the increased speed of the heart rate.
- This change in the heart rate is called variability, and one of the many jobs of the autonomic nervous system is to regulate this.
- Variability is a good thing when it comes to our heartbeat, and in fact to all of our autonomic functions

# Heart Rate Variability - HRV

From: *One Simple Thing: A New Look at the Science of Yoga and How It Can Transform Your Life* by Eddie Stern

- Because the heart rate speeds up and slows down with the inhalations and exhalations, this activity can be monitored by an electrocardiogram test, which measures the electrical activity of the heart
- Heart rate variability is thus a snapshot of the health and balance of the autonomic nervous system
- If the heart does not slow down on the exhale, the vagal brake is not functioning properly, and the sympathetic nervous system is in overdrive
- This can be triggered by experiencing a traumatic event, or, as in the case of many people, result from exposure to consistent, low levels of stress on a daily basis.
- Our culture right now is one of sympathetic overdrive
- Low heart rate variability and low vagal tone are associated with heart disease, high blood pressure, diabetes, and many inflammatory diseases.

# Why Check Heart Rate Variability? [www.webmd.com](http://www.webmd.com) & [elitehrv.com](http://elitehrv.com)

## 1. It can identify ANS imbalances; you soon learn to trust your intuition

When stressed the difference between heartbeats is low

When calm the difference between the heartbeats is high

## 2. HRV can detect stress levels

People with low HRV can easily experience acute stress

People with high HRV rarely experience stress

## 3. Increases awareness of your lifestyle habits

## 4. Detects your reaction to the environment, and emotions

## 5. Increases your self-awareness, physically, mentally and emotionally

## 6. Prevents burnout from stress and helps avoid overdoing

## 7. Identifies risk of illness early to accelerate recovery

## 8. Quantifies progress over time to see if you are improving or declining

## 9. Helps you stay accountable to your goals

# Stress & Homeostasis

## 1. Stress

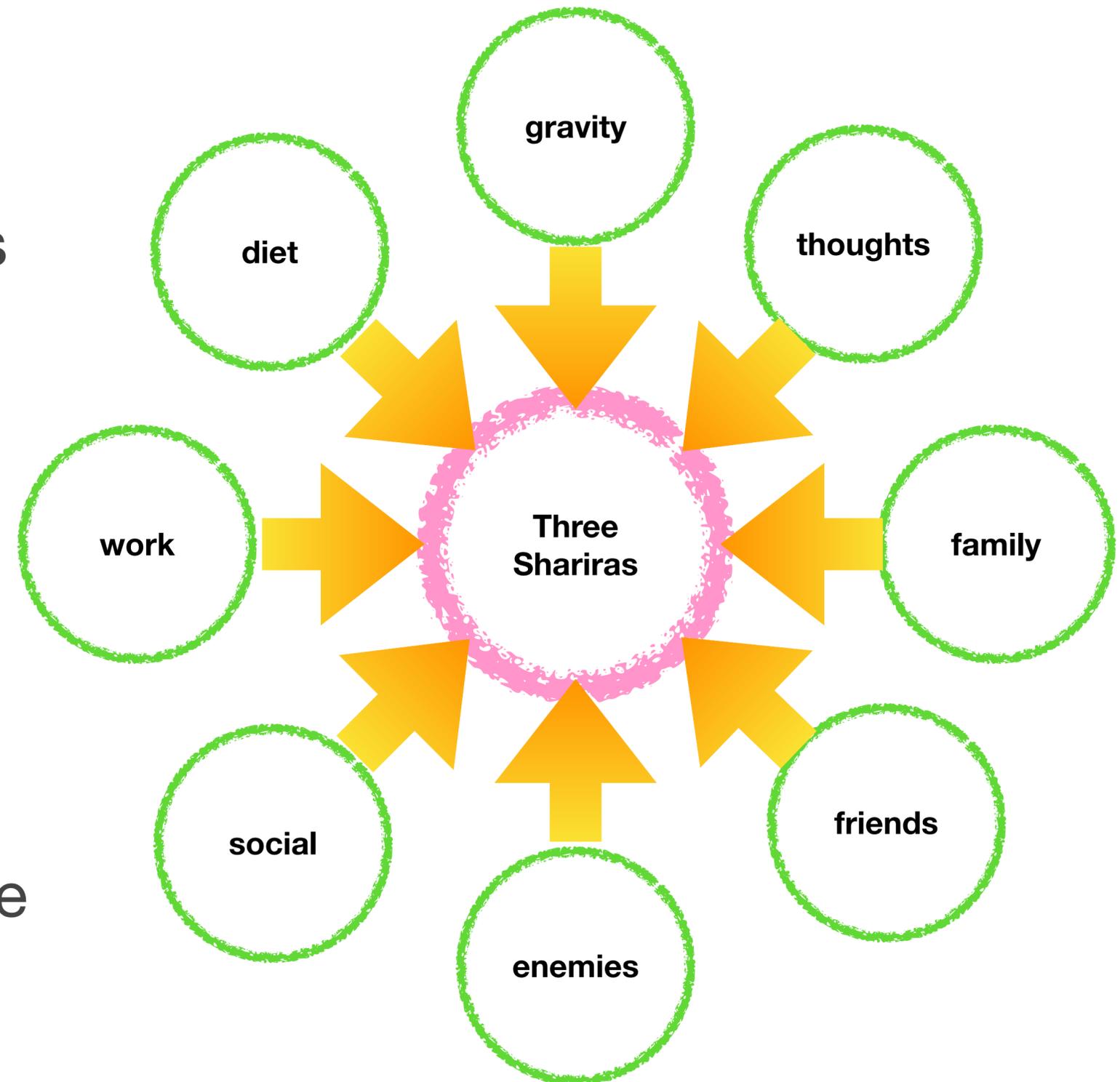
Reaction to any stimulus that causes imbalance in the 3 shariras

### Eustress

Beneficial stress

### Distress

Negative stress



## 2. Homeostasis

Constant effort to maintain balance in all shariras

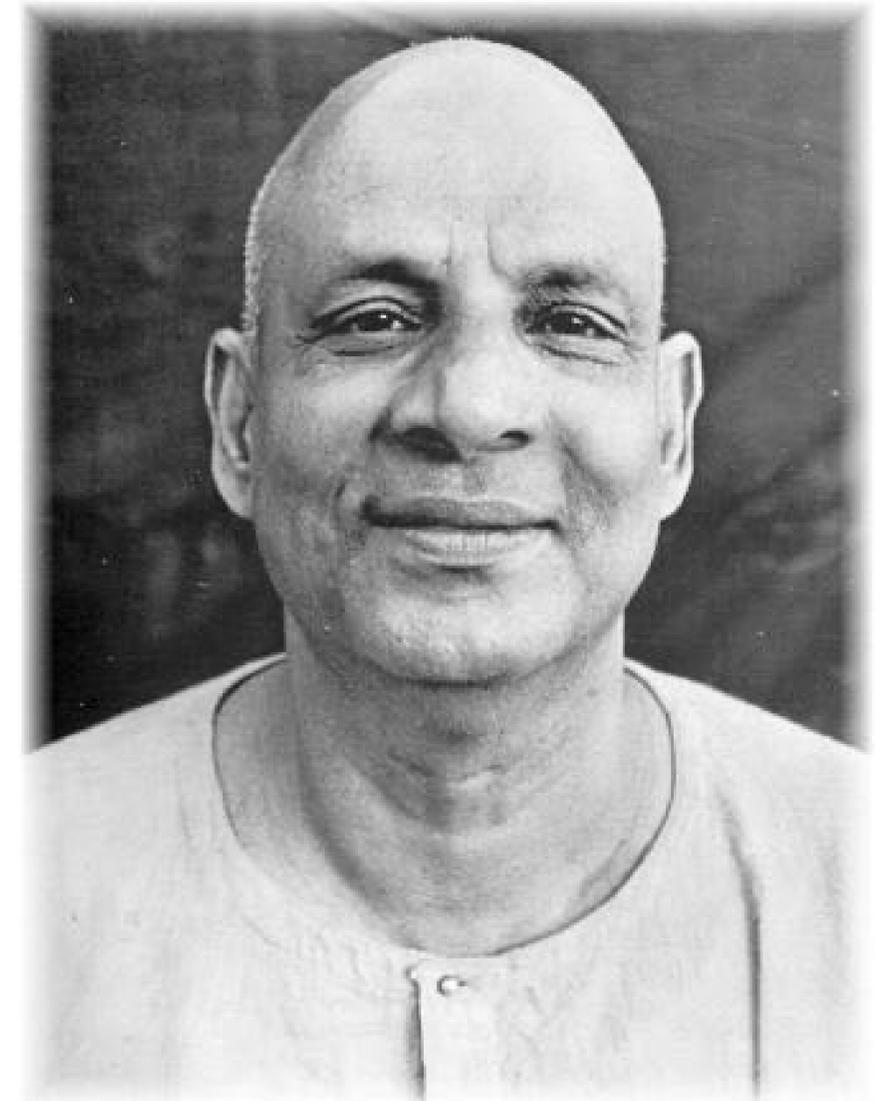
# Allostasis

## 1. **Adaption and change** in response to stressors

*“Adapt, adjust, accommodate,  
bear insult, bear injury,  
highest yoga”*

Swami Sivananda

## 2. **More adaptability** makes it easier to regain homeostasis



# Stress is cumulative

## 1. Unfamiliar stress

Requires greater resources to adapt

## 2. Familiar stress

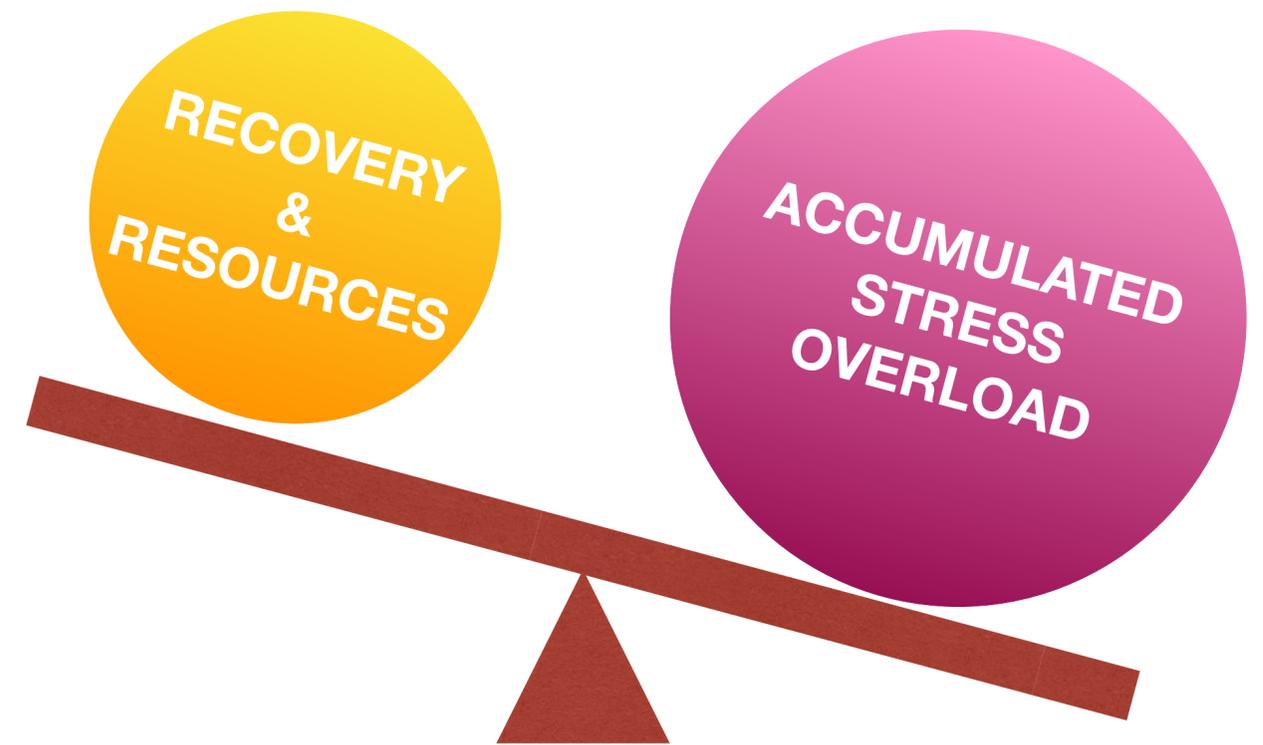
Requires less because of adaption

## 3. Effective handling of one stress

Frees resources to deal with more

## 4. Accumulated stress

Leads to imbalance and susceptibility to **Overload**



# General Adaption Syndrome

Identified by Hans Selye

1. Stress response  
defends then fatigues
2. **Stage 1**  
Survival “fight or flight”
3. **Stage 2**  
Adaption – resiliency
4. **Stage 3a**  
Return to homeostasis  
Build resistance
5. **Stage 3b**  
Exhaustion – leads to  
long term damage

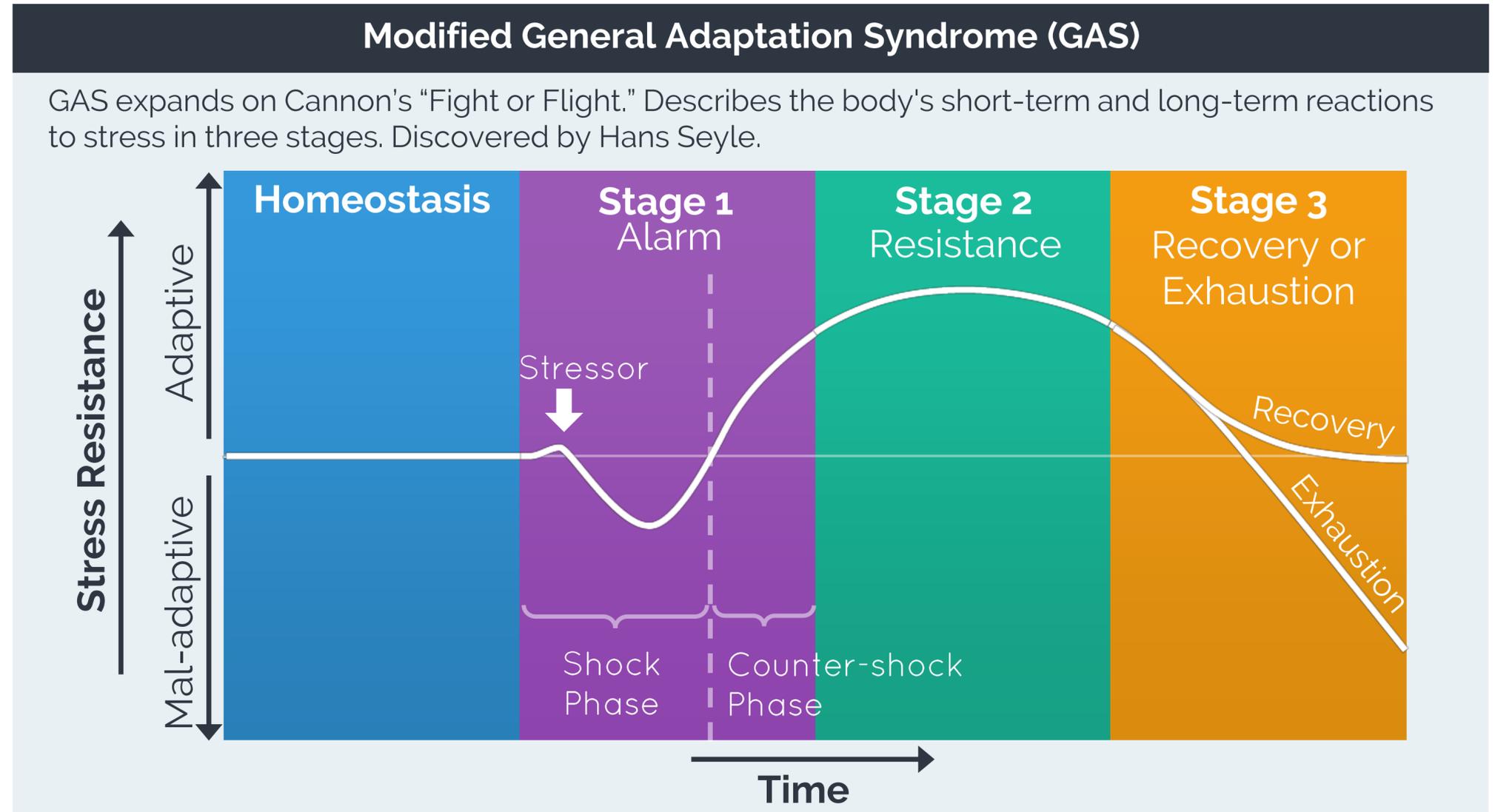
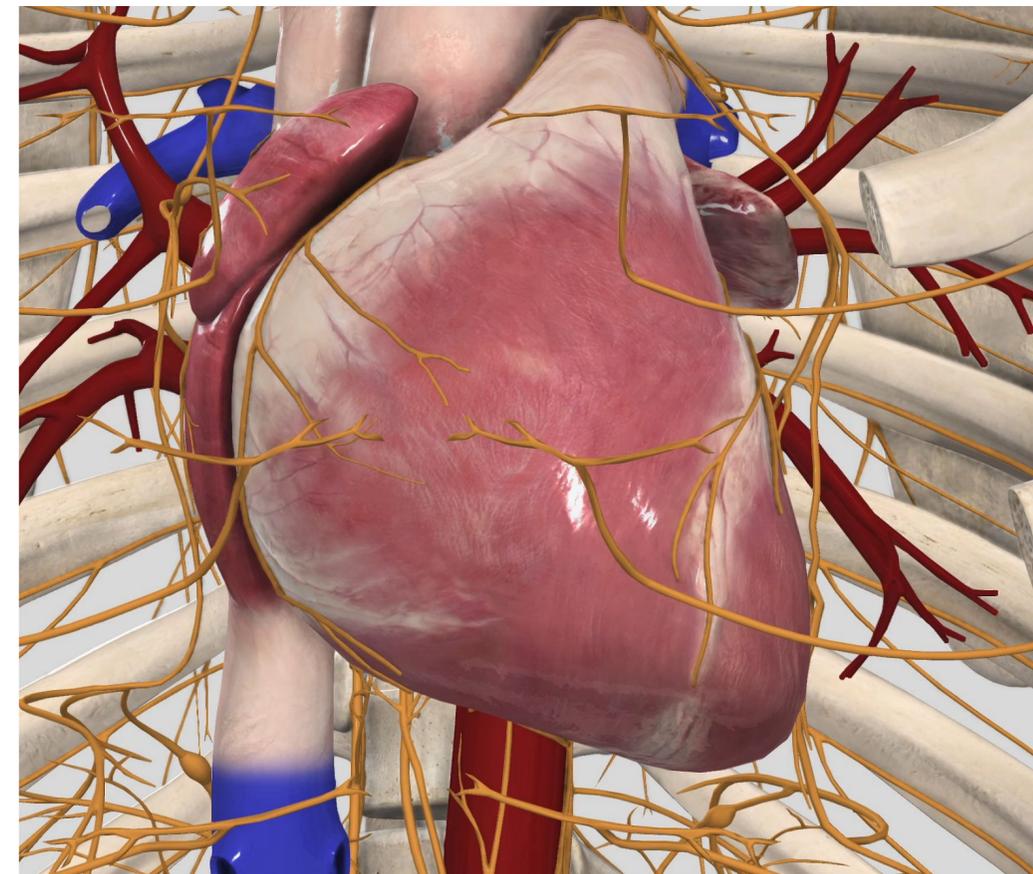
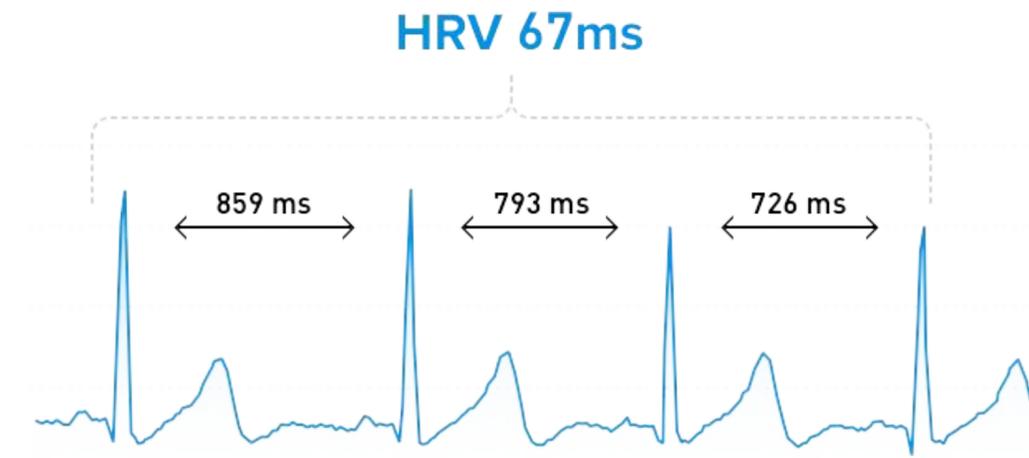


Chart from [elitehrv.com](http://elitehrv.com)

# Why is there variability in heart rate?

1. **Variability** is the result of the adaptive responses in the shariras to stressors
2. **Variability is good**
3. **Regulatory mechanisms: Short term**
  1. Respiratory System
  2. Cardiovascular System
  3. Autonomic Nervous System
4. **Regulatory mechanisms: Long term**
  1. Circadian rhythm
  2. Hormonal patterns
  3. Cumulative stressors
  4. Body temperature



# How and when to measure Heart Rate Variability (HRV)?

## 1. How to use an HRV monitor

1. Free apps using smartphone flash – getting more accurate
2. Finger, chest strap, ring and ear monitors. Apps free, device costly.

## 2. When to measure HRV (Be consistent)

1. Establish your baseline
2. Within 30 minutes from waking – eliminates variables
3. Or during a rest time according to your schedule
4. Measure daily or a minimum of 3 days per week
5. Each app & device has different instructions
6. There are many demographics around HRV measurements

# References

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  7. **SYMPATHETIC NERVOUS SYSTEM**  
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ॐ सर्वे भवन्तु सुखिनः  
सर्वे सन्तु निरामयाः ।  
सर्वे भद्राणि पश्यन्तु  
मा कश्चिद्दुःखभाग्भवेत् ।  
ॐ शान्तिः शान्तिः शान्तिः ॥

oṃ sarve bhavantu sukhinaḥ  
sarve santu nirāmayāḥ  
sarve bhadrāṇi paśyantū  
mā kaścid duḥkha bhāgbhavet  
oṃ śāntiḥ śāntiḥ śāntiḥ

May all be happy, may all be free from disease, may all see goodness,  
may none suffer from sorrow.

ॐ असतो मा सद्गमय ।  
तमसो मा ज्योतिर्गमय ।  
मृत्योर्मा अमृतं गमय ।  
ॐ शान्तिः शान्तिः शान्तिः ॥ हरिः ॐ तत्सत् ॥

asato mā sadgamaya  
tamasomā jyotir gamaya  
mrityormāamritam gamaya  
Om śhānti śhānti śhāntiḥ harih om tat sat

Lead me from changing existence to unchanging being,  
lead me from the darkness of tamas to the light of knowledge,  
lead me from death to immortality. Harih om that is truth.