One Health
Student Conference
USAMV București

Hidden Cardiac Risks in Everyday Dietary Habits

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2025

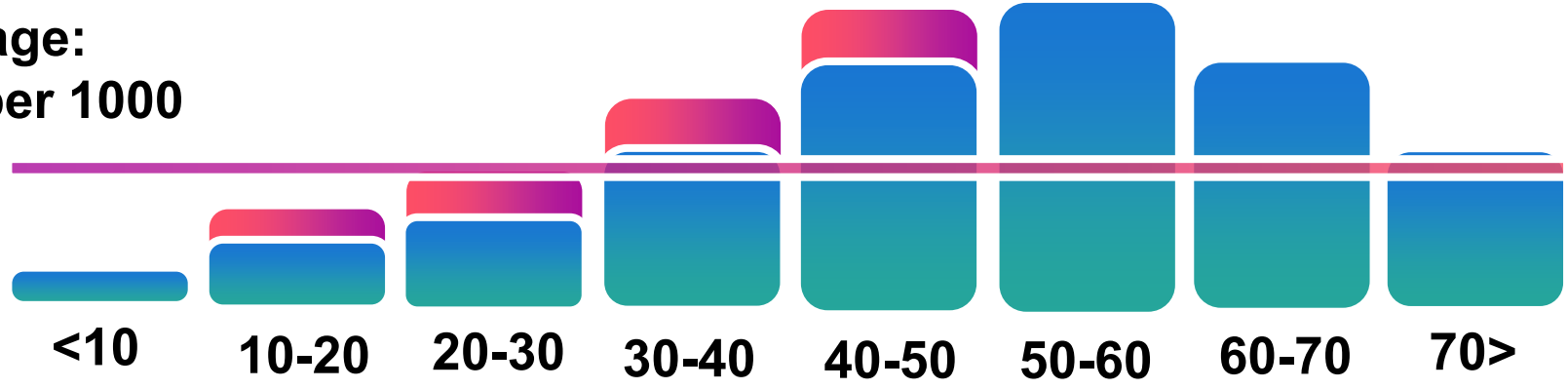
Lifestyle 20 years ago…

Lifestyle now

A parallel emerging trend…

Distribution of reported cardiac events – age group

Average:
8 cases per 1000



Incidence for cardiovascular event under 40 years has a 2% increased year over year.

Cardac stroke population, 20% of them are under 40 years.

From 1990-2019, the absolute incidence of CVDs in adolescents and young adults increased globally by 45.5%.

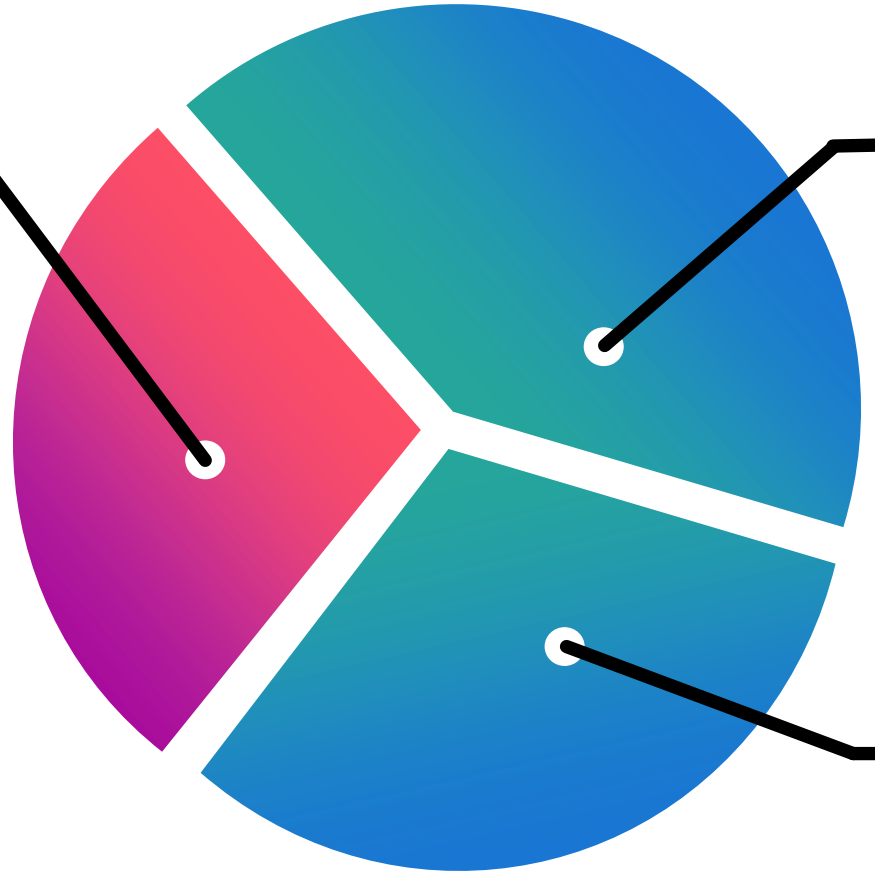
Heart Attacks Increasingly Common in Young Adults - American College of Cardiology, 2019

Alarming Rise in Heart Failure Deaths, Especially Among Younger Adults - Duke University School of Medicine, 2024

Cardiac risk contributors

Genetics
20–30%

We cannot control…

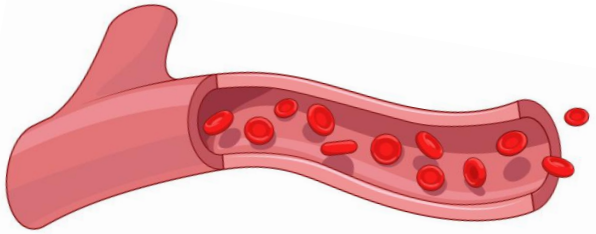


Life style
40–50%

We can control up to 80% !

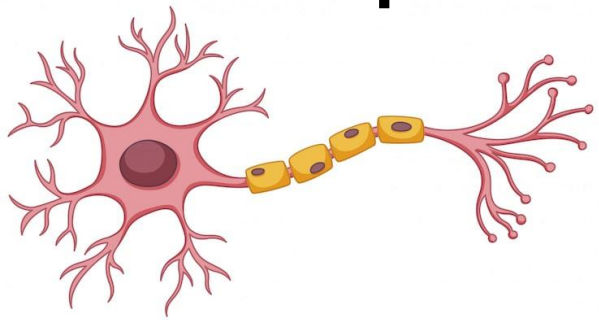
Dietary and nutrition
25–35%

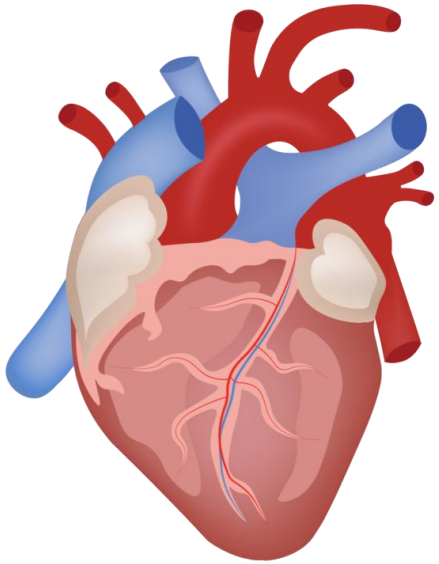
Link between nutrients and heart



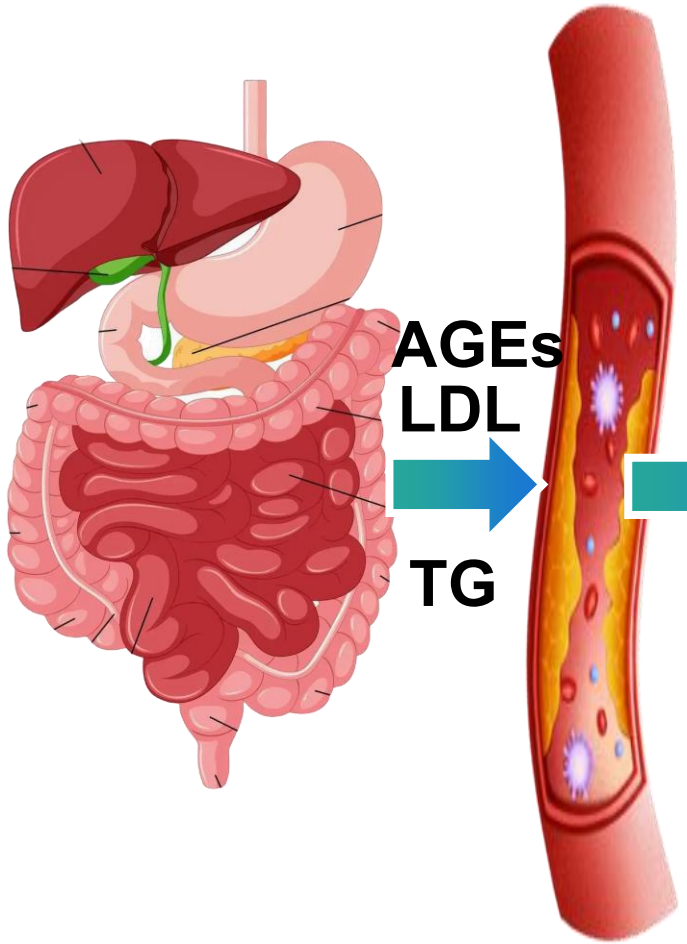
Mechanical path

Electical path



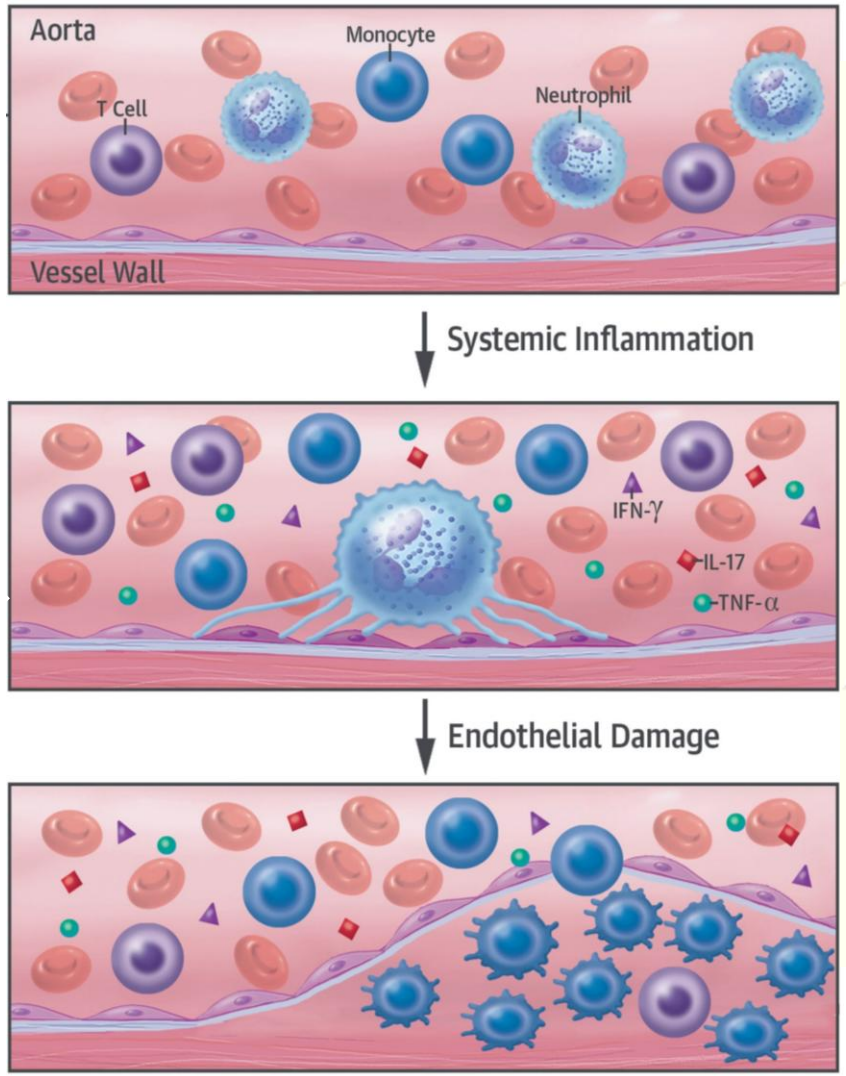


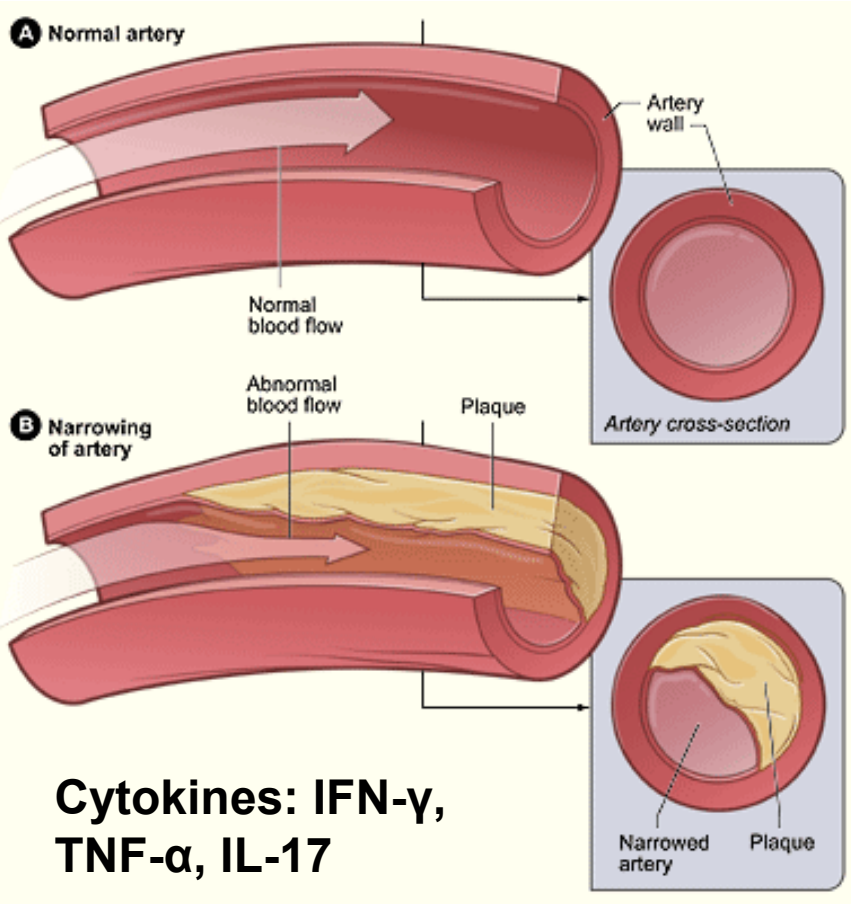
Mechanical path



AGEs
LDL

TG





Cytokines: IFN-γ, TNF-α, IL-17

LDL – Low Density Lipoprotein; TG – Triglycerides; AGEs – Advanced Glycation End-products

Risks for blood vessels

Sugar

Insulin, triglycerides:

Endothelium inflammation, arterial lipid deposition

30-40%

Salt

Na^+ by osmosis:

Increased blood volume – creates additional mechanical stress

12-22%

Trans fats

Increased LDL concentration:

Endothelium inflammation, arterial lipid deposition

28-34%

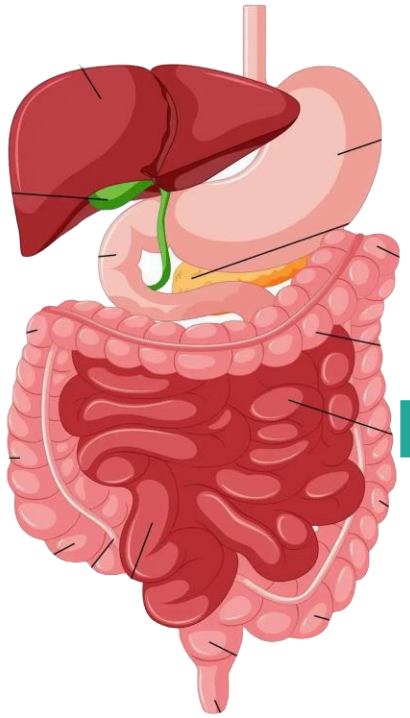
Meats

Increased LDL concentration:

Endothelium inflammation, arterial lipid deposition

18%

Electrical path

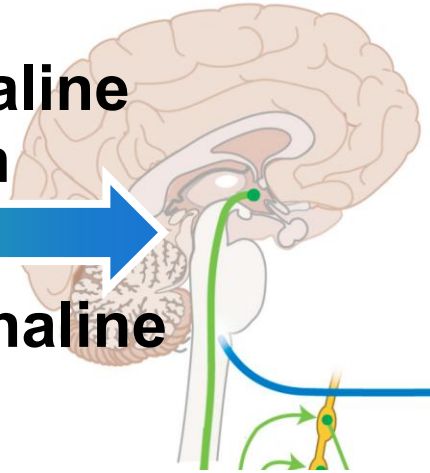


Adrenaline
Insulin

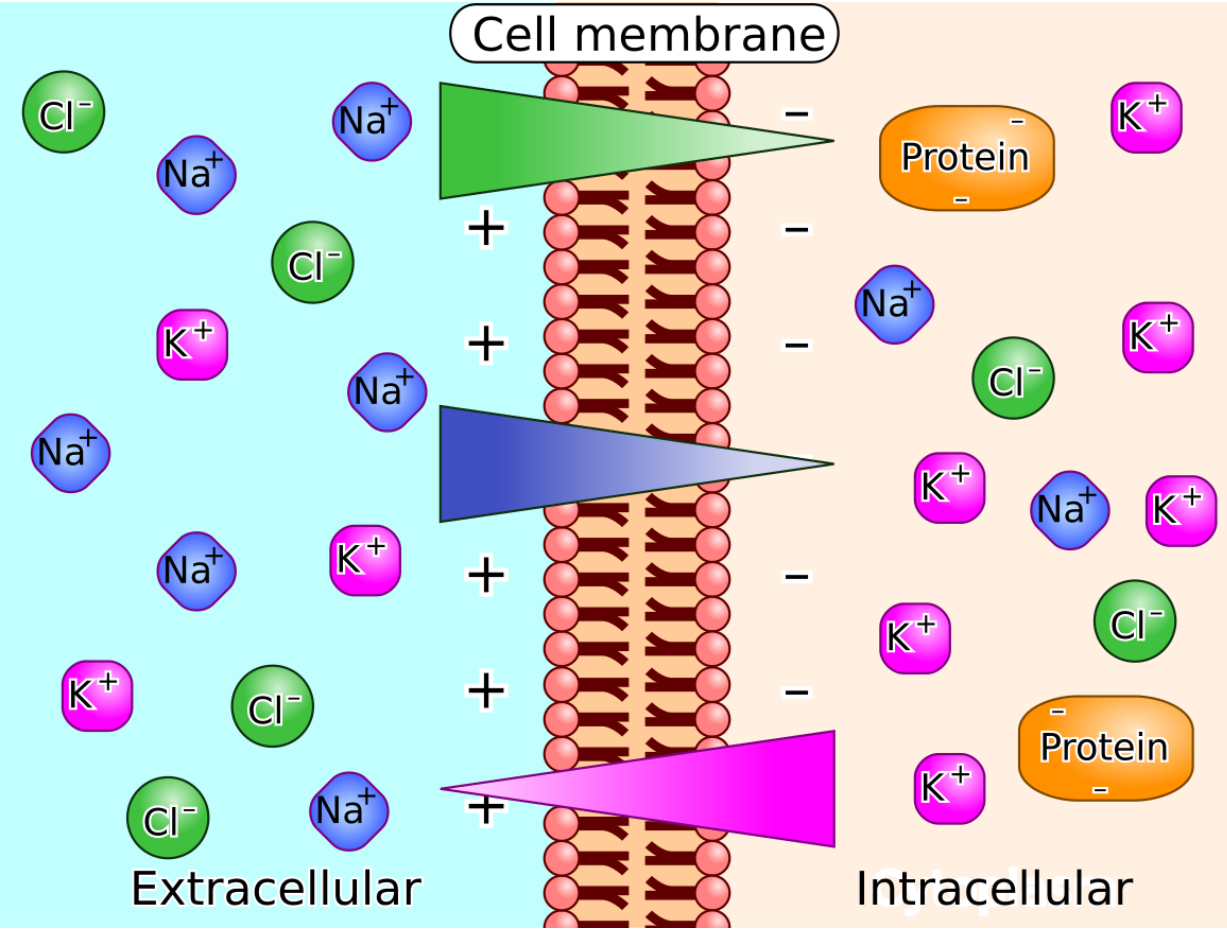
Nordrenaline

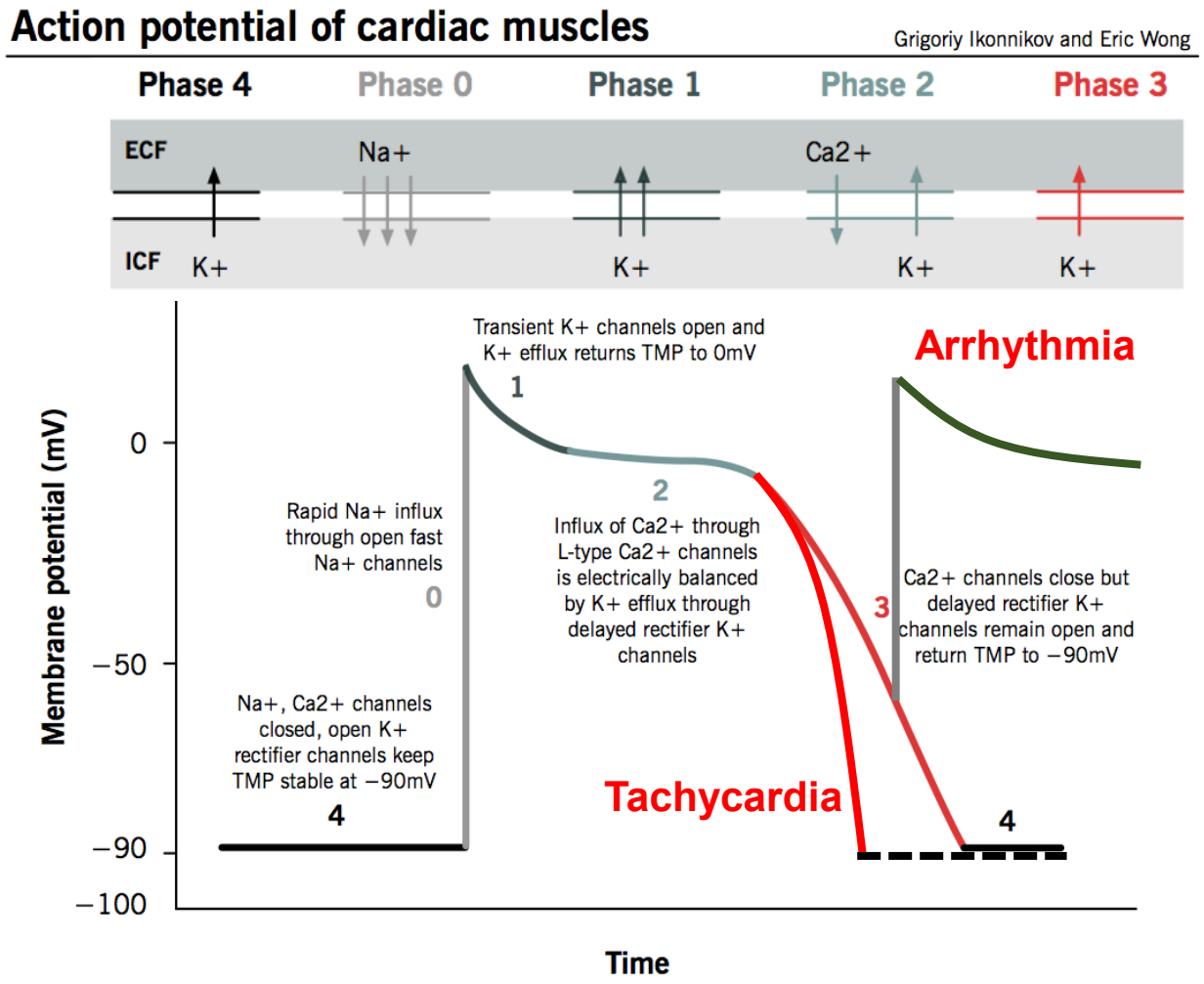
Insulin

Mg,K,Na



Electrical path





Phase 0 – Rapid Depolarization

Phase 1 – Initial Repolarization

Phase 2 – Plateu Phase

Phase 3 – Rapid Repolarization

Phase 4 – Resting Phase

Risks for electrical activity

Alcohol

Norepinephrine:

Ca^{2+} and Na^{+} channels ateration – electrical instability

30-50%

Carbs

Hyperinsulinism:

Ionic channels inflammation - tahycardy

20-30%

Energy drinks

Caffeine and sugar:

Sympathetic system overstimulated

20-40%

Coffee

Caffeine:

Spike influx in Ca^{2+} – electrical instability.

15-25%

Risks Mitigation

Fruits and Vegetables

Antioxidants and essential minerals:

Lowering vascular inflammation, improving methabolic stability

20-40%

Nuts

Healthy unsaturated fats and micronutrients:

Improving lipid profile, lowering systemic inflammation

15-30%

Cereals

High fiber content, slow-released carbs:

Glycemic stability, improving methabolic inflammation.

10-20%

Fish

Omega-3:

Stabilize cardiac cell membrane, lowering vascular inflammation

18%

What about lifestyle?

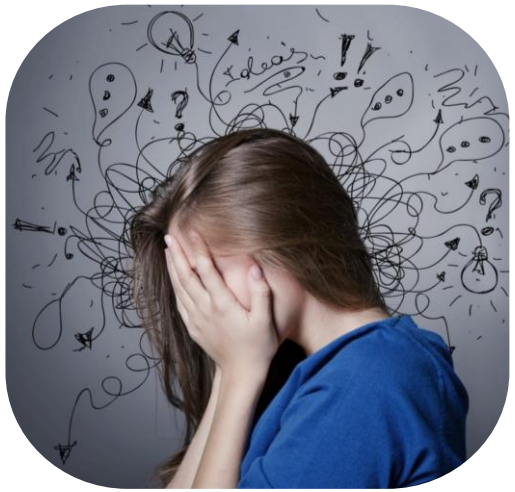
Stress

Cortisol and Adrenaline:

Increased electrical activity, blood vessels constriction

30-50%

Anxiety



Cortisol and Adrenaline:

Increased electrical activity, blood vessels constriction, endothelium inflammation

20-40%

Sleep depravation

Lack of Melatonin, Adenosine, Leptin:

Increased electrical activity, endothelium inflammation

25-40%

Smoking

Adrenaline and Noradrenaline:

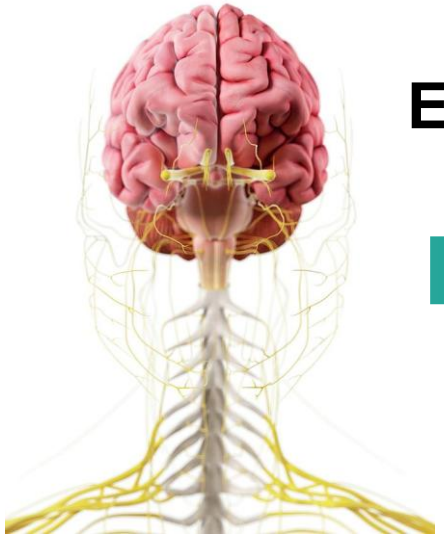
Increased electrical activity, vasoconstriction

70-200%

From nutrients to heart – conclusion

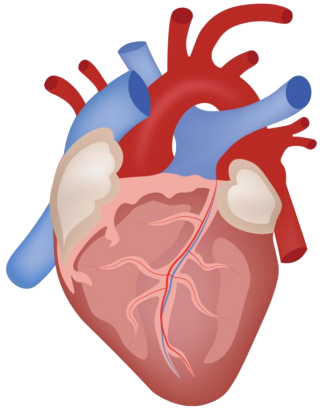
Influencing electrical activity

Influencing endothelium layer and blood volume



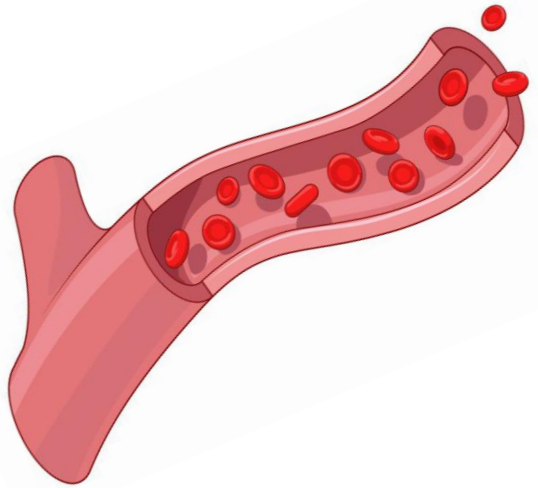
Electrical fire rate

Cell membrane potenatial



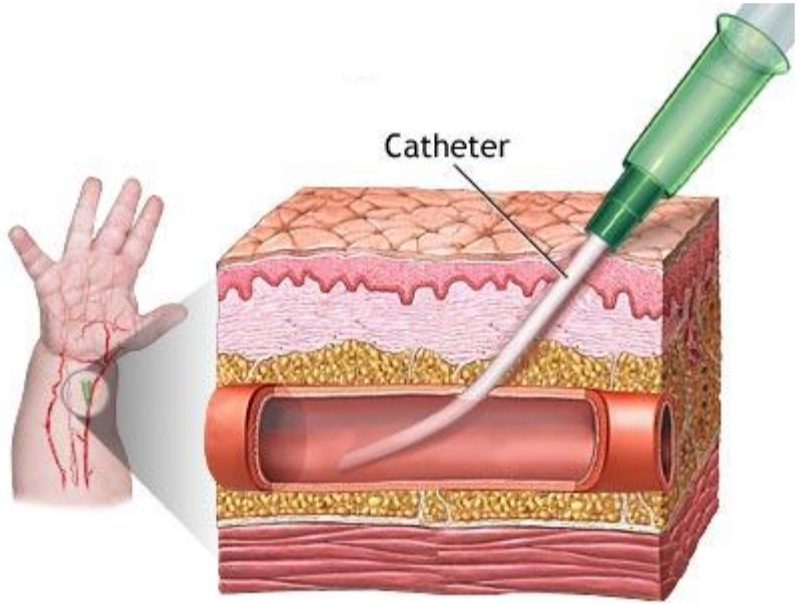
Mechanical load

Blood flow resistance



Monitoring heart activity

Invasive Devices



Intensive care setting

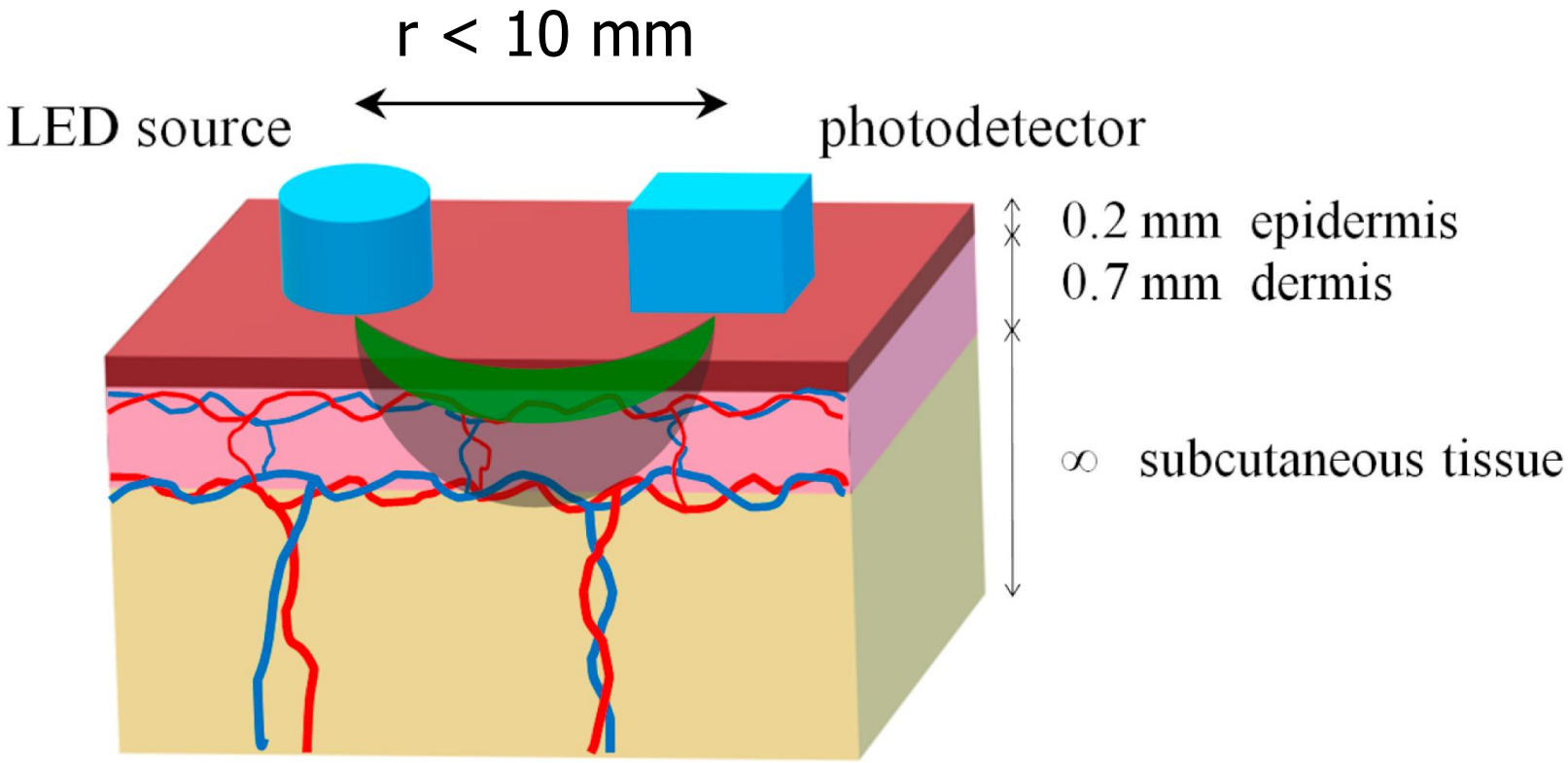
Noninvasive Devices

Medical

Consumer

Pulse oximetry (PPG)

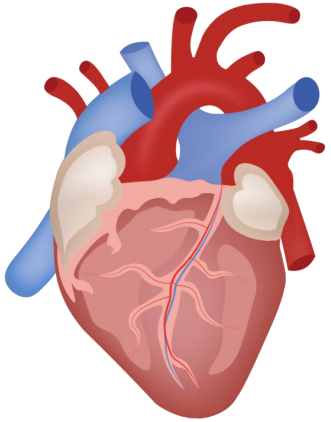
Most popular heart monitoring technology, especially for wearables.



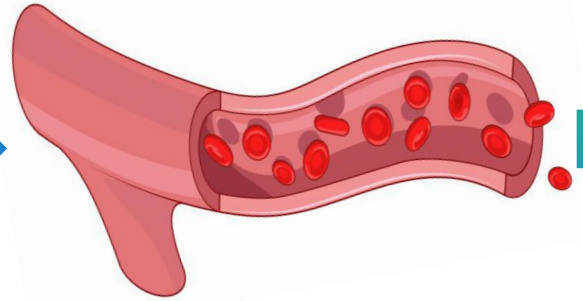
Light hits the capillaries activity and a part of it is reflected back.

PPG – Monitoring Capability

Periodic pump action

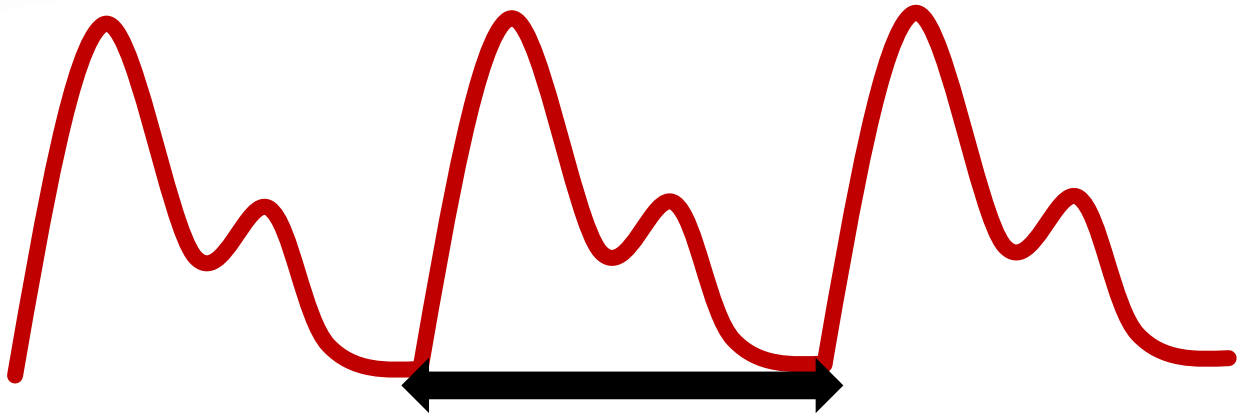


Periodic blood velocity (flow)



Periodic red blood cells deformation (only in capillaries)

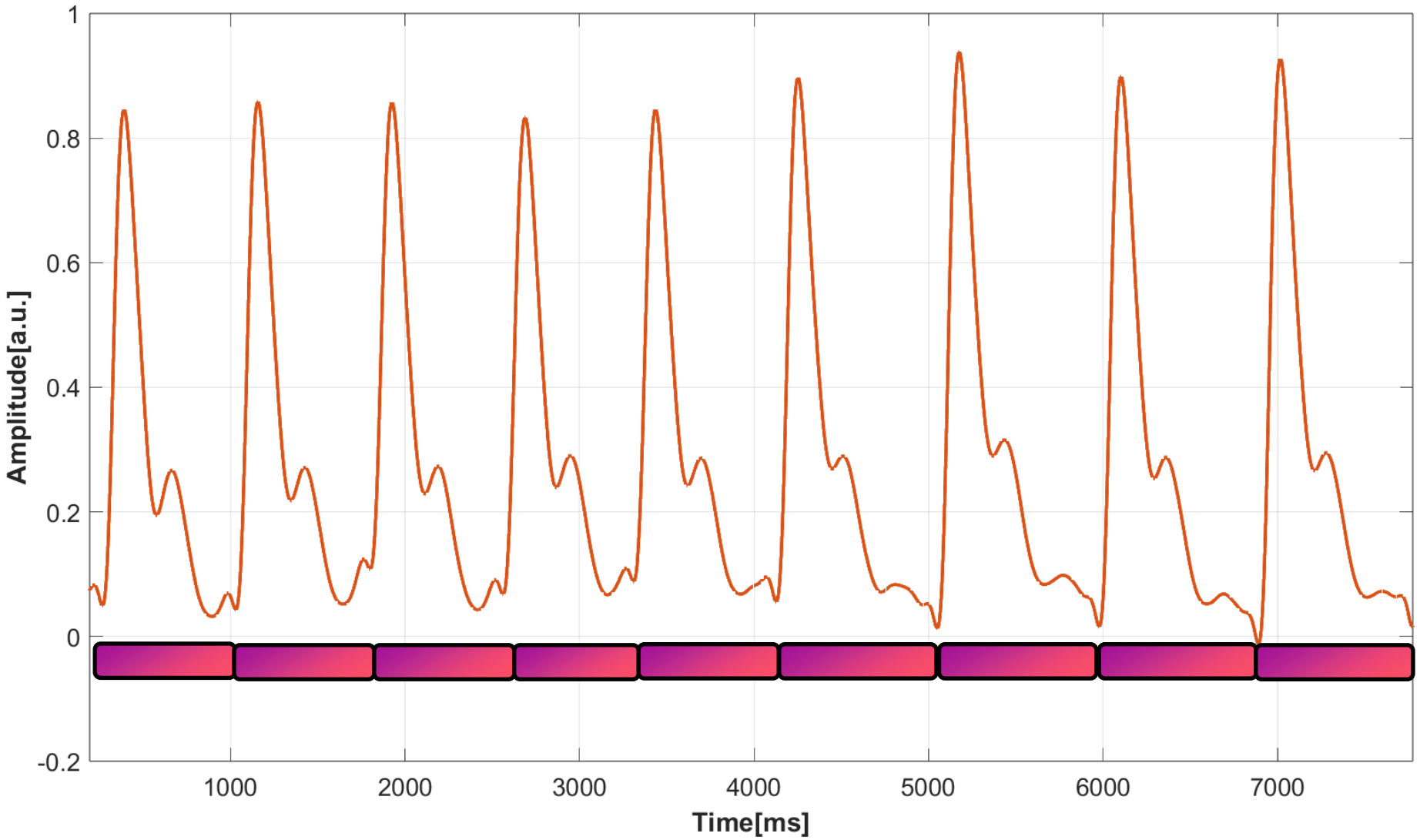
Heart rate (HR)



Wave shape

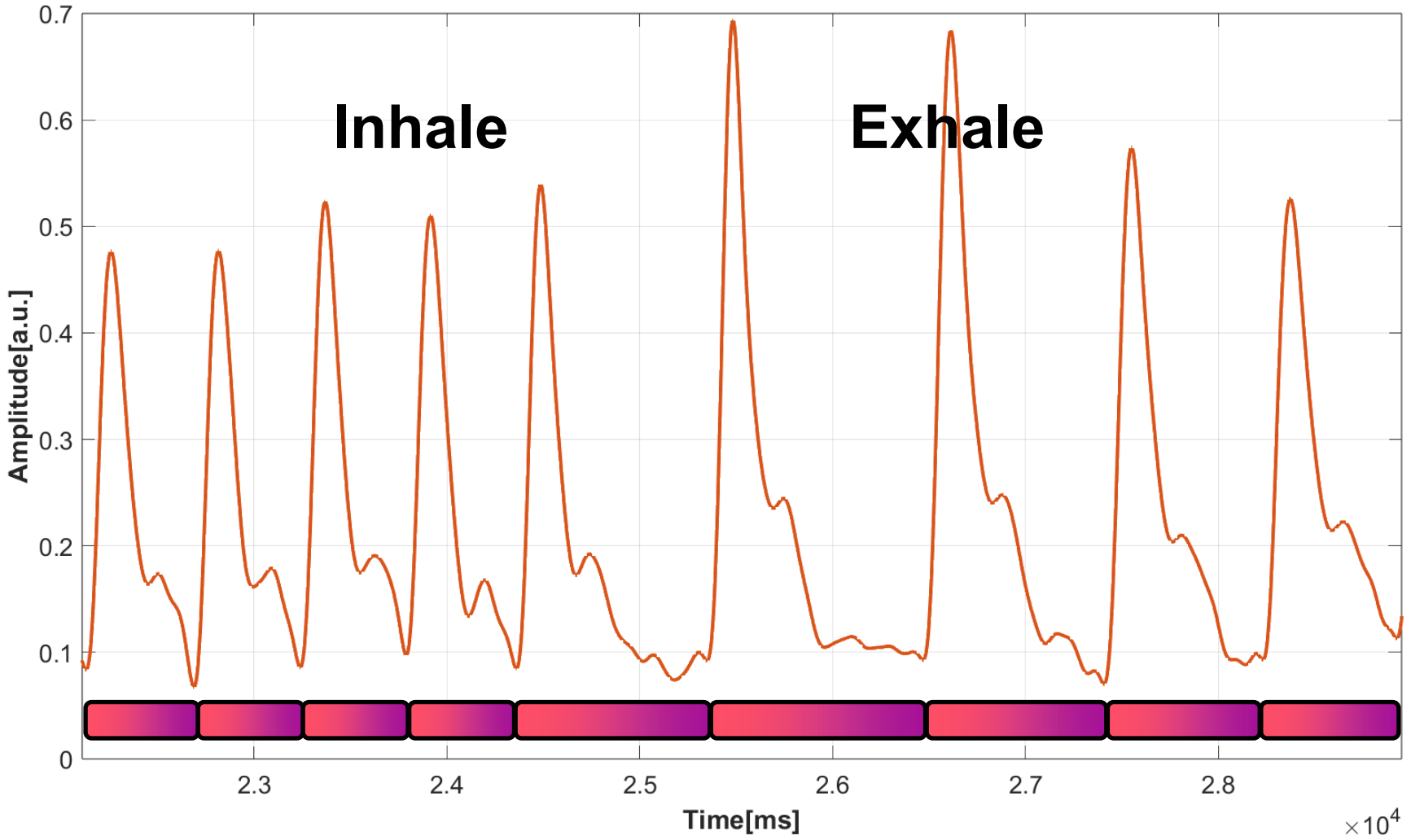
Cardiac cycle

Heartbeat profile in healthy



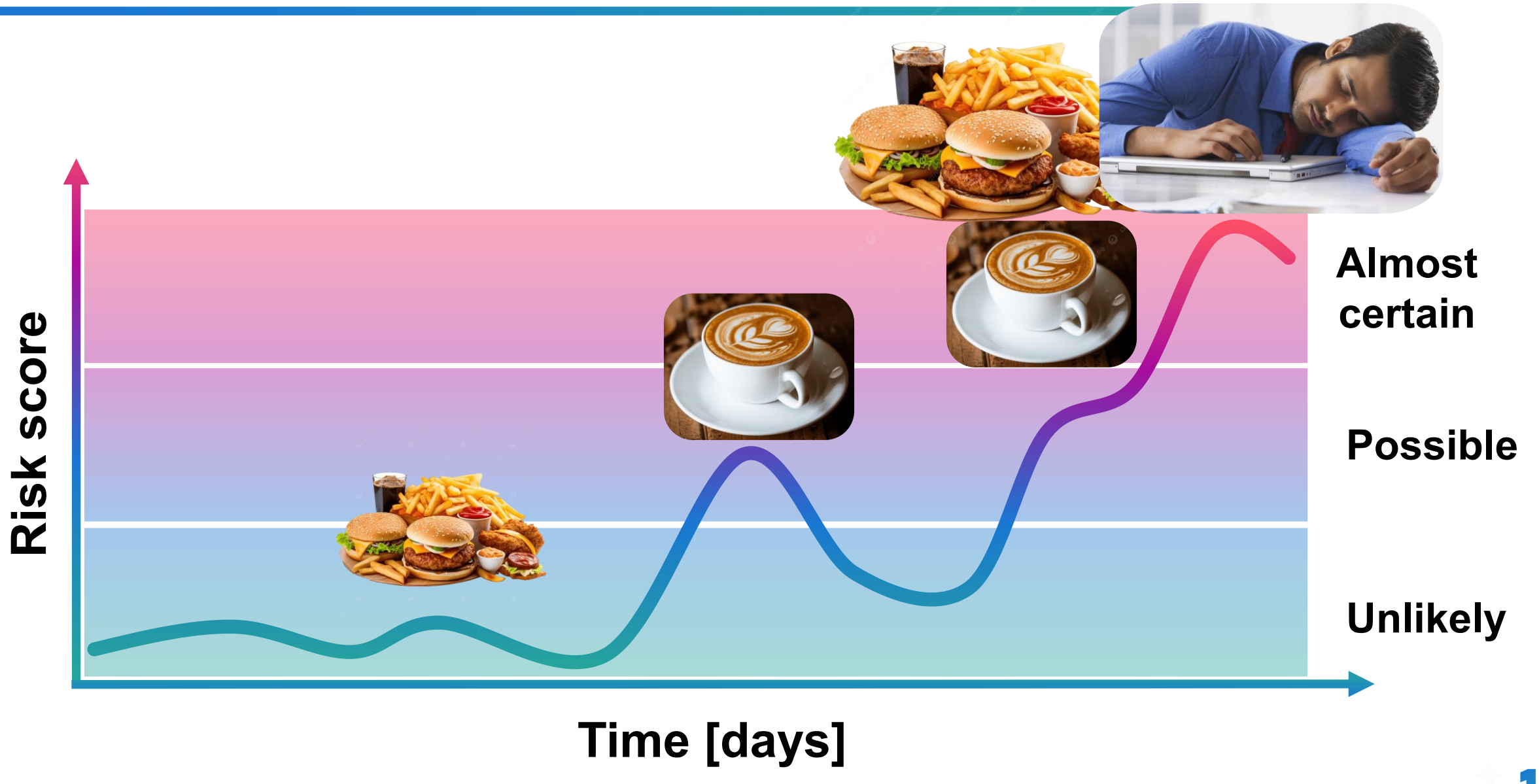
Equally cardiac cycles

Heartbeat profile in healthy



Acceleration-deceleration pattern
Respiratory Synus Arrhythmia

Cumulative cardiac risks

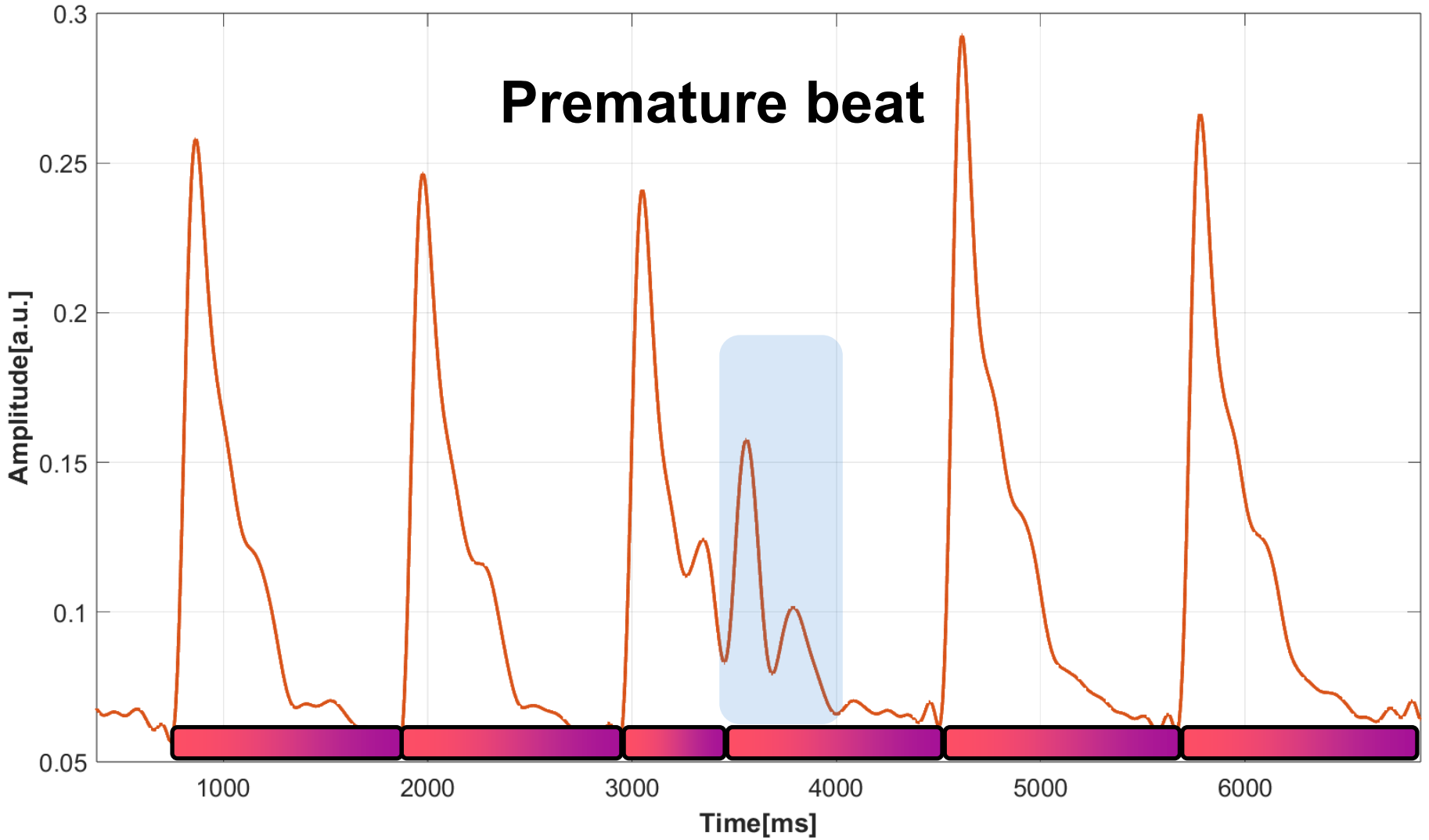


Arrhythmic beat

5% Occurrence:

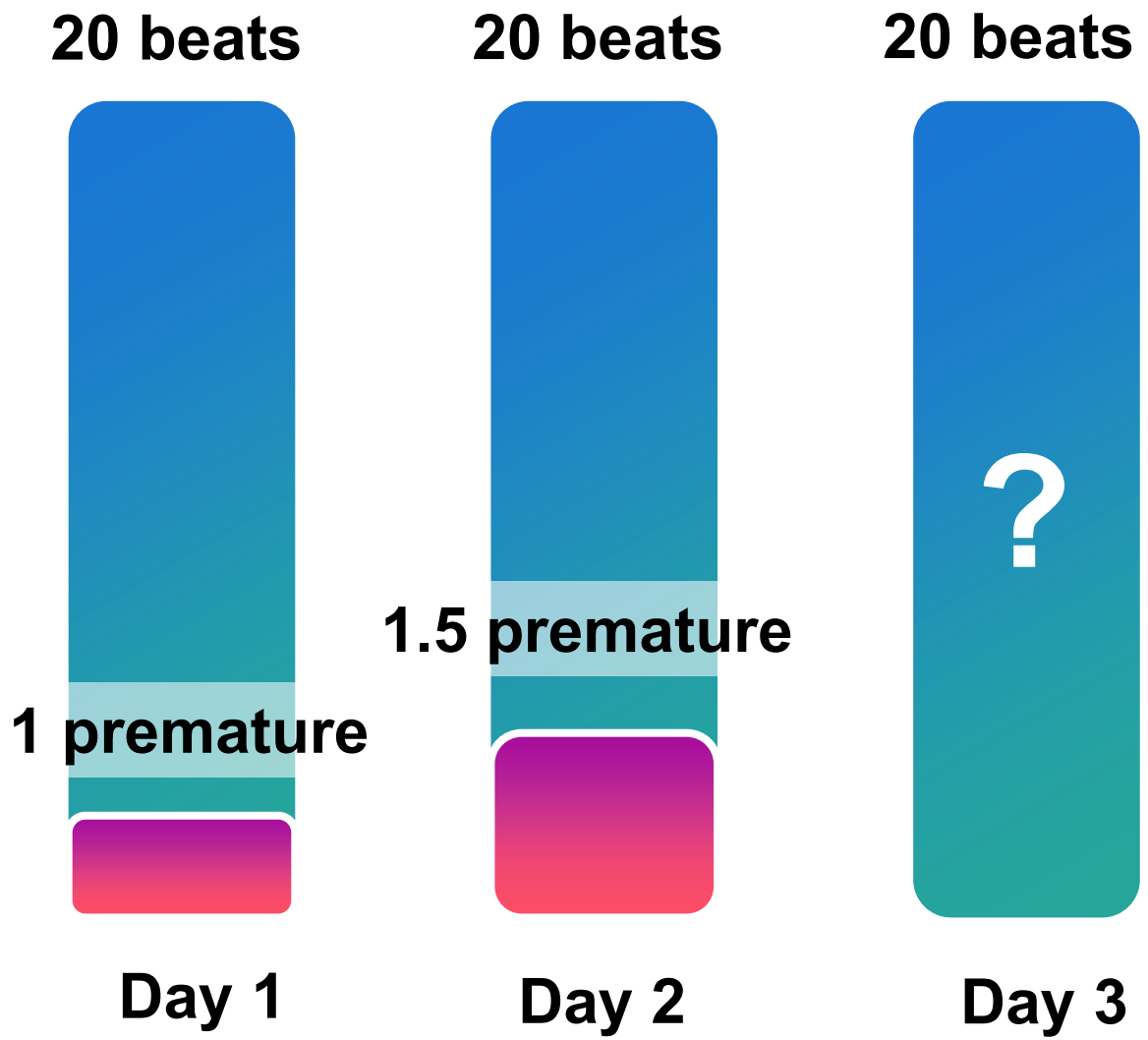
19 stable (not shown all recording)

1 premature



HR[BPM]: 60 120 100 60

Arrhythmic pattern evolution



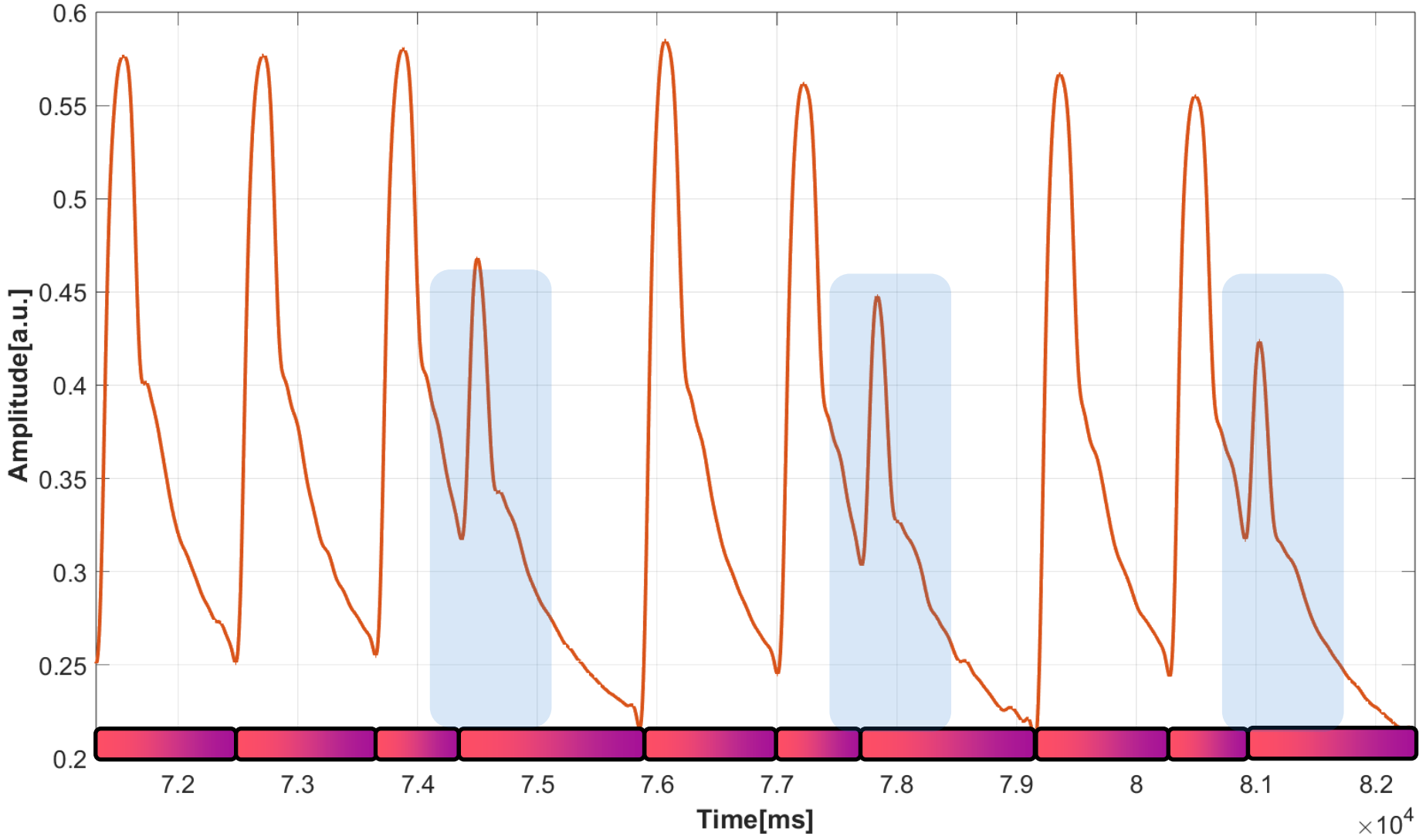
Possible evolution?

Possible evolution 1

Up to 20% Occurrence:

4 stable

3 premature

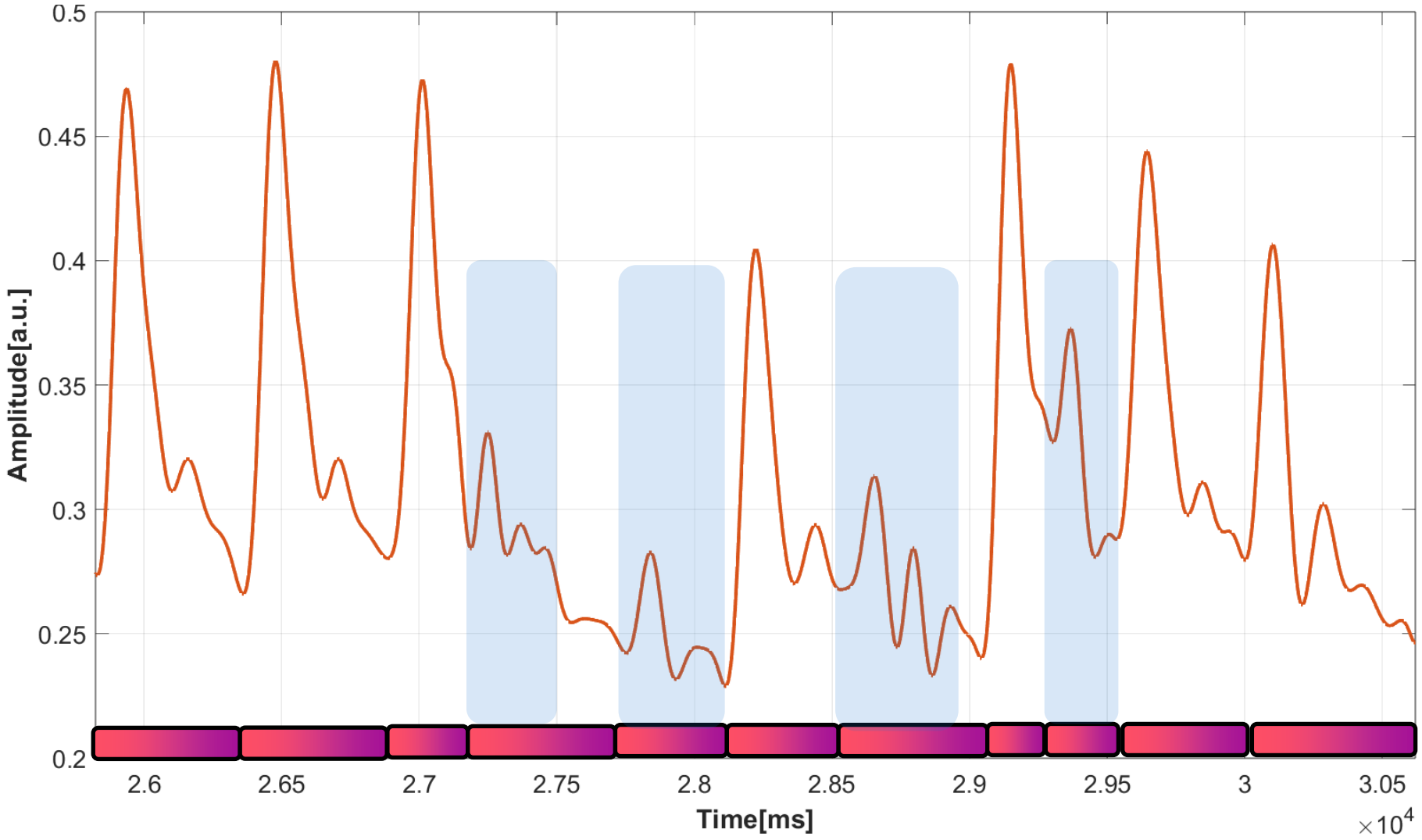


Possible evolution 2

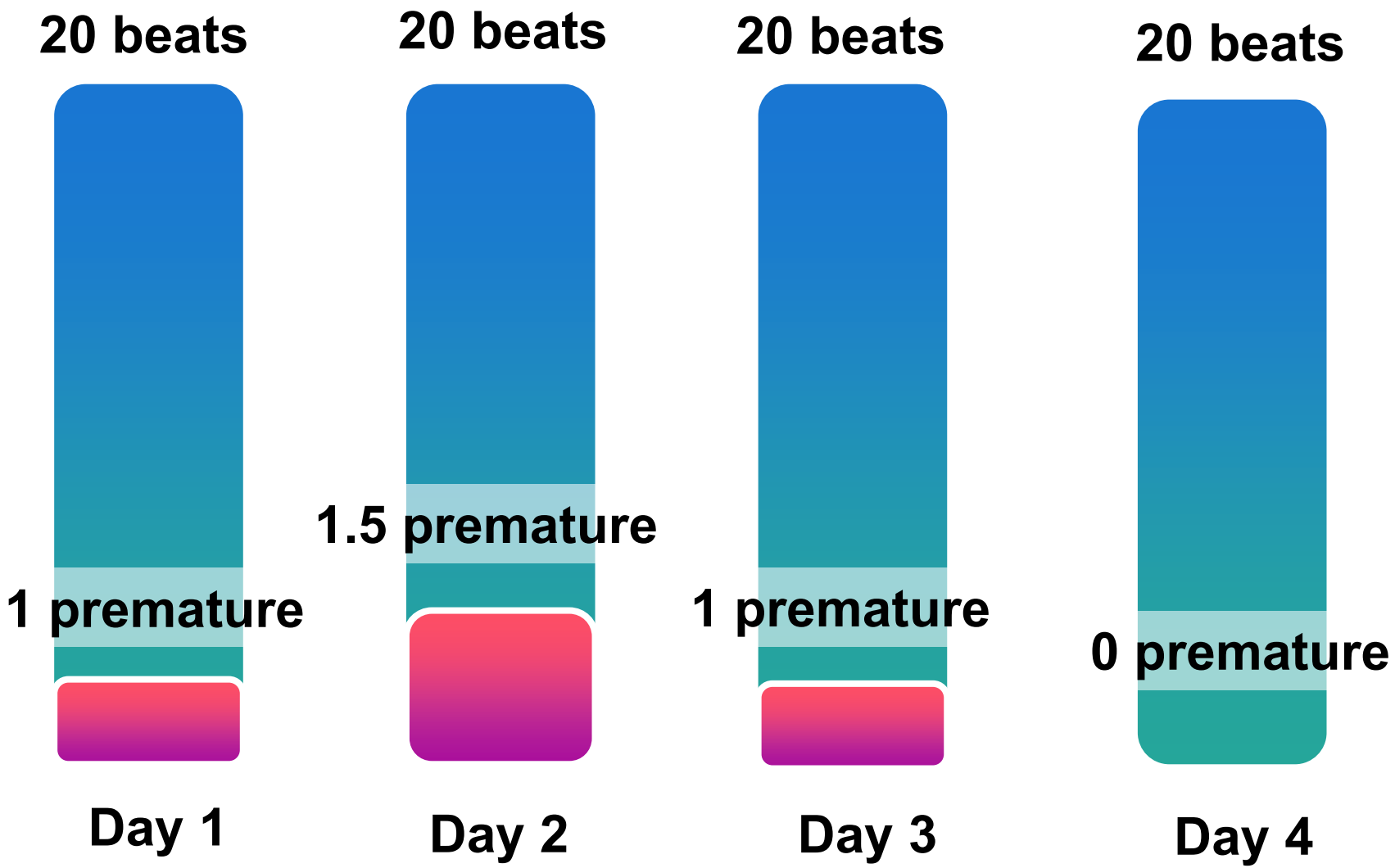
Up to 70% Occurrence:

6 stable

5 premature



Real evolution – Beningn Arrhythmia



Benign Arrhythymia – Characteristics

Up to 80% of adults experience it at some point during their lifetime.

The average duration 1-3 days

If it does not disappear after 5 days, a cardiology consultation is required.

Most affected individual don’t notice it.

Best treatmeant

Conclusions

Dietary choices influence heart performance on both the mechanical and electrical levels.

Excessive intake acts as a *cumulative* risk factor over time.

Benign arrhythmias are warning signals that physiological imbalance is emerging.

Beware of survivorship bias — we tend to notice the exceptional cases who survive, not the majority who do not.

Cardiovascular risks are real; in many cases only a final trigger is missing before disease manifests.

Up to 80% of cardiac risk can be influenced through lifestyle and nutrition.

Thank you!