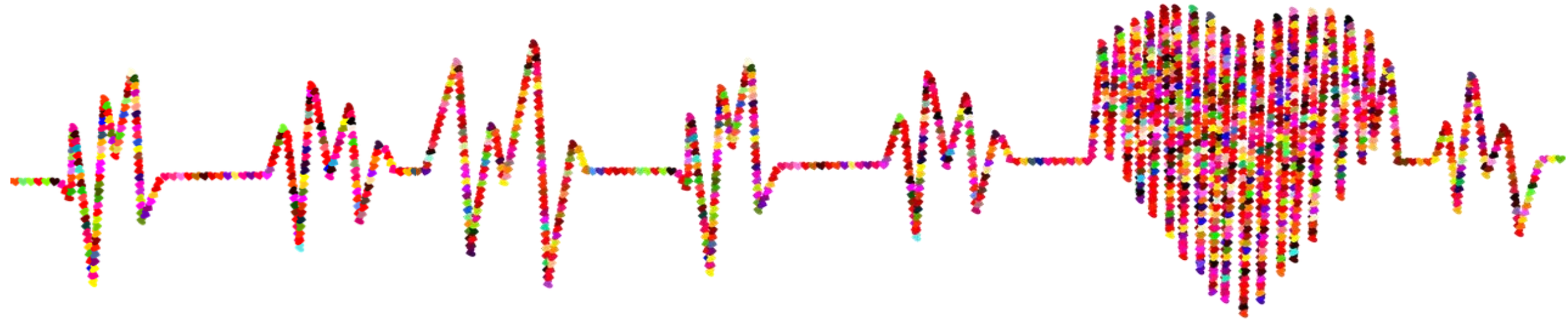




TERRANOVA
SYNERGISTIC NUTRITION

HEART MATTERS



By: Orley Moyal HD
Training & Education Manager
BIONATURE - TERRANOVA


LIVEVIBRANTLY
CHOOSE CAREFULLY



UK Cardiovascular Disease: 5 Key Facts



1



170,000+
deaths each year
460 each day

Around 1 in 4 UK deaths.

2



8 million+
living with CVD

Over 4 million men and
over 4 million women.

3



1.9 million
in England with CHD

General practice
diagnosis, 2025.

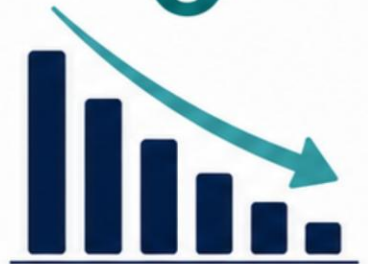
4



1.2 million
in England with
stroke or TIA

General practice
diagnosis, 2025.

5



CHD admissions
down **46%**
since 2005

But major inequalities
remain.



Sources: British Heart Foundation (2025); Office for Health Improvement and Disparities (2025).

CARDIOVASCULAR DISEASE (CVDx)



An **'umbrella'** / general term referring to diseases affecting the **heart** and **vasculature/ blood vessels**.

INCLUDES:



Ischaemic Heart Disease / Coronary Artery Disease Angina, Heart Attack



Cerebrovascular Disease - Stroke



Diseases of the Aorta and Arteries – incl. Hypertension & Peripheral Vascular Disease



Congenital Heart Disease



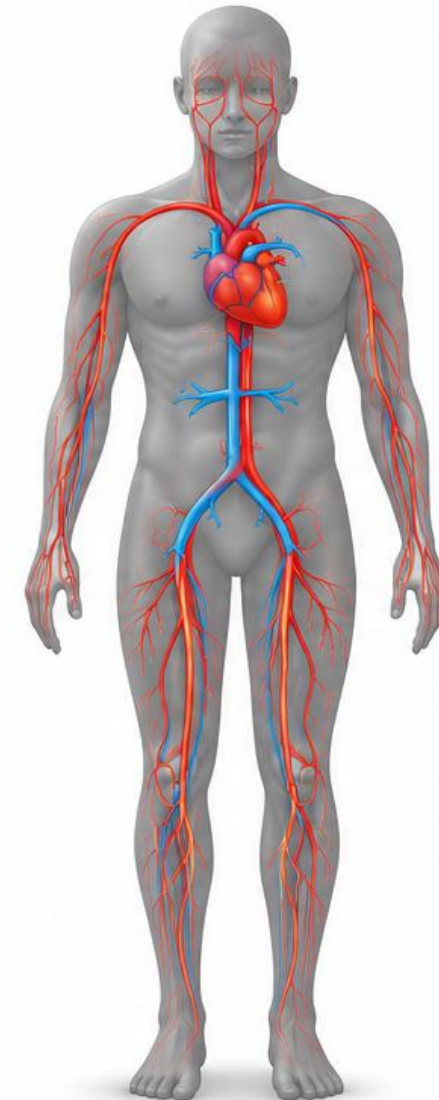
Rheumatic Heart Disease

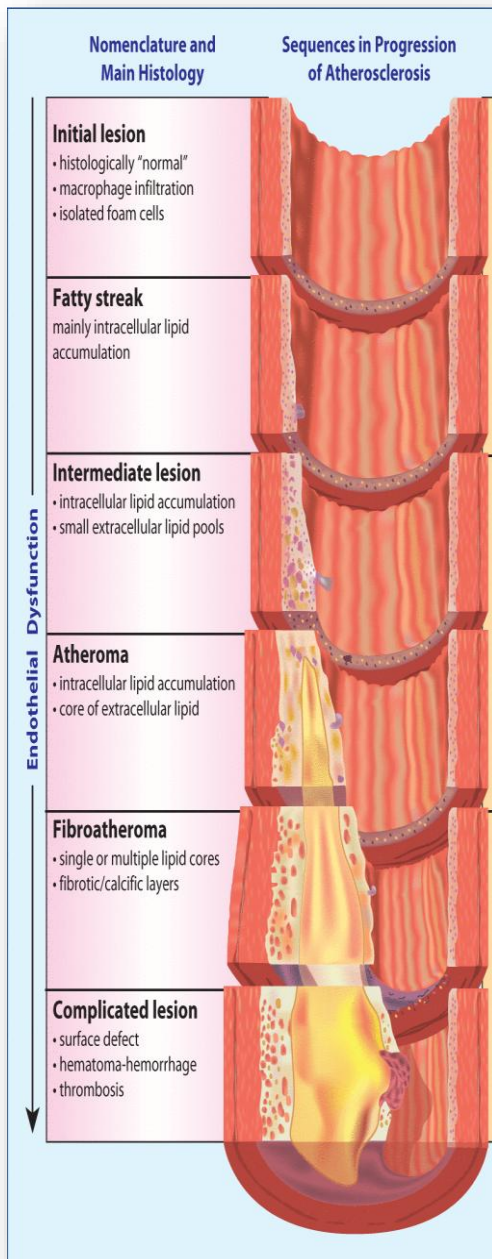


Cardiomyopathies



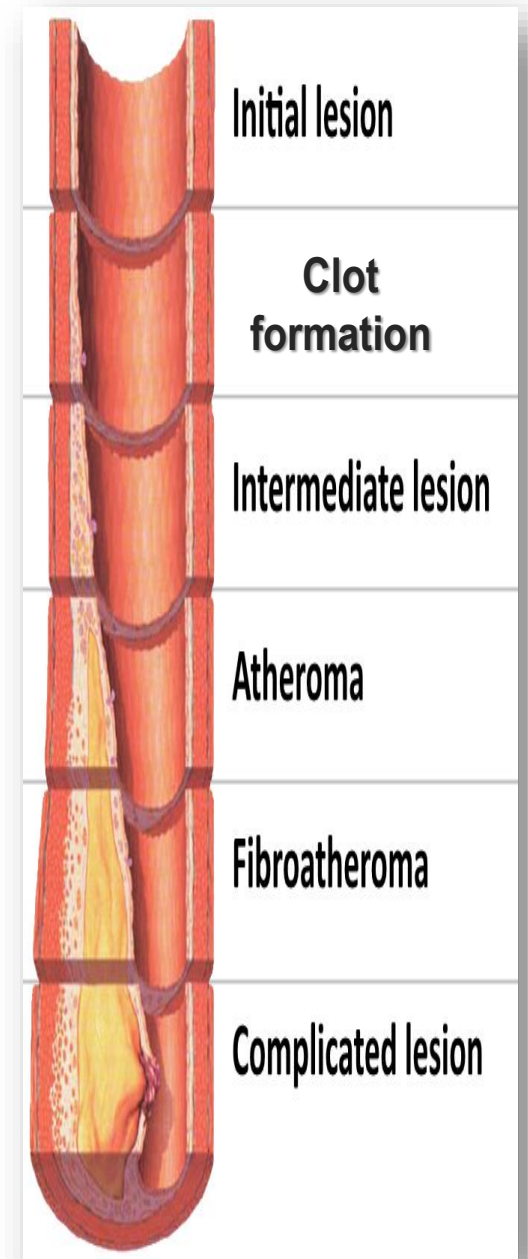
Cardiac **Arrhythmias**





ATHEROSCLEROSIS = ROOT OF CVDx

'LDL- CHOLESTEROL' Theory of ATHEROSCLEROSIS	CLOTTING/ THROMBOGENIC Theory of ATHEROSCLEROSIS
1.ENDOTHELIAL (<i>Inner lining</i>) INFLAMMATION DAMAGE / DYSFUNCTION	
2. Oxidized LDL & Foam Cells leak through the porous/ 'leaky' vascular wall and form 'Fatty Streaks'	2. CLOT/ THROMBUS is formed over the lesion to cover & repair damage.
3. A PLAQUE (<i>inner 'cap'</i>) develops and grows as new blood clots are deposited on top of the existing plaque. Over the years the CLOT DEGENERATES & PLAQUE TRANSFORMS into many different forms e.g. <i>Fibrous</i> plaque (Fibroatheroma) with a liquid , necrotic core or <i>Calcified</i> Plaque.	
4. A " <i>final</i> " OBSTRUCTIVE BLOOD CLOT forms on the already enlarged plaque, occluding the vessel completely and causing a heart attack / stroke.	



SOURCE: https://restorativemedicine.org/wp-content/uploads/2016/07/jrm.2013.2.0105_fig3.gif

TABLE SOURCE: Kendrick, M (2021). *The Clot Thickens - The enduring mystery of heart disease*. United Kingdom: Columbus Publishing Ltd. 103-104.

SOURCE: <https://www.ucd.ie/mededtec/overPath/atherosclerosis/images/progression.png>

WHAT'S REALLY PRESENT IN ATHEROSCLEROTIC PLAQUES?

- **RED BLOOD CELLS**, their **REMNANTS** & **MICRO-THROMBI** (*NOT Fatty Streaks*)³
- **CHOLESTEROL CRYSTALS** - *free/ pure* cholesterol molecules, found in high concentrations in **Red Blood Cell membranes** that are incorporated into the atherosclerotic plaque as part of the initial Blood Clot formation.¹⁻²
- **LIPOPROTEIN (a)** - Plaques have been shown to contain **Apo(a)**, which could only come from **Lp(a)**, as **LDL** does not contain this extra, 'sticky' protein.
- Since **LDL** is too large to cross the endothelial membrane and **Lp(a)** would have been incorporated into the initial & subsequent clots at the site of damage, it stands to reason that it is **Lp(a)** and not **LDL** in the Plaques.⁴⁻⁶
- **SMOOTH MUSCLE CELLS**
- **LYMPHOCYTES, MACROPHAGES & FOAM CELLS**
- **FIBRINOGEN, PROTEOGLYCANS, COLLAGEN & ELASTIN**
- **CALCIUM**

Advanced Atherosclerotic Plaque

Cross-Section of Medium-Sized Artery

ARTERIAL WALL LAYERS

Tunica Intima
Endothelium
Subendothelial Layer

Internal Elastic Lamina

Tunica Media
Smooth Muscle Cells
Elastin

External Elastic Lamina

Tunica Adventitia
Collagen
Vasa Vasorum

KEY FEATURES

- Lipid-rich necrotic core with cholesterol crystals and lipoprotein(a)
- Inflammatory cells (lymphocytes, macrophages, foam cells)
- Red blood cells and micro-thrombi on eroded plaque surface
- Fibrous cap with collagen and elastin
- Calcification in deeper plaque

1. Red blood cells, remnants & micro-thrombi (erythrocytes, fragmented debris and small thrombotic clumps)

2. Cholesterol crystals (needle-like crystal clefts)

3. Lipoprotein(a) (golden particles)

4. Smooth muscle cells (spindle-shaped cells in the fibrous cap/shoulder)

5. Lymphocytes, macrophages & foam cells (inflammatory cell cluster with foam cells)

6. Fibrinogen, proteoglycans, collagen & elastin (extracellular matrix)

7. Calcium (chalky white calcified nodules)

An advanced **Atherosclerotic Plaque** is not merely a passive lipid deposit; it is a biologically active, thrombo-inflammatory lesion containing blood-derived material, inflammatory cells, matrix proteins, cholesterol crystals, and calcification.

THE “ENCrustation Hypothesis”

Karl von Rokitansky, 1852

170 years ago, renowned Austrian Pathologist and founder of Science-based Diagnostics - Karl von Rokitansky, proposed that..... ‘**CVDx results from the excessive & repeated deposition of blood constituents (red blood cells, platelets & fibrin) on the inner lining/ membrane of the blood vessel walls, ultimately causing thickening (atheroma) & calcification /hardening (atherosclerosis) of the arterial walls.**’



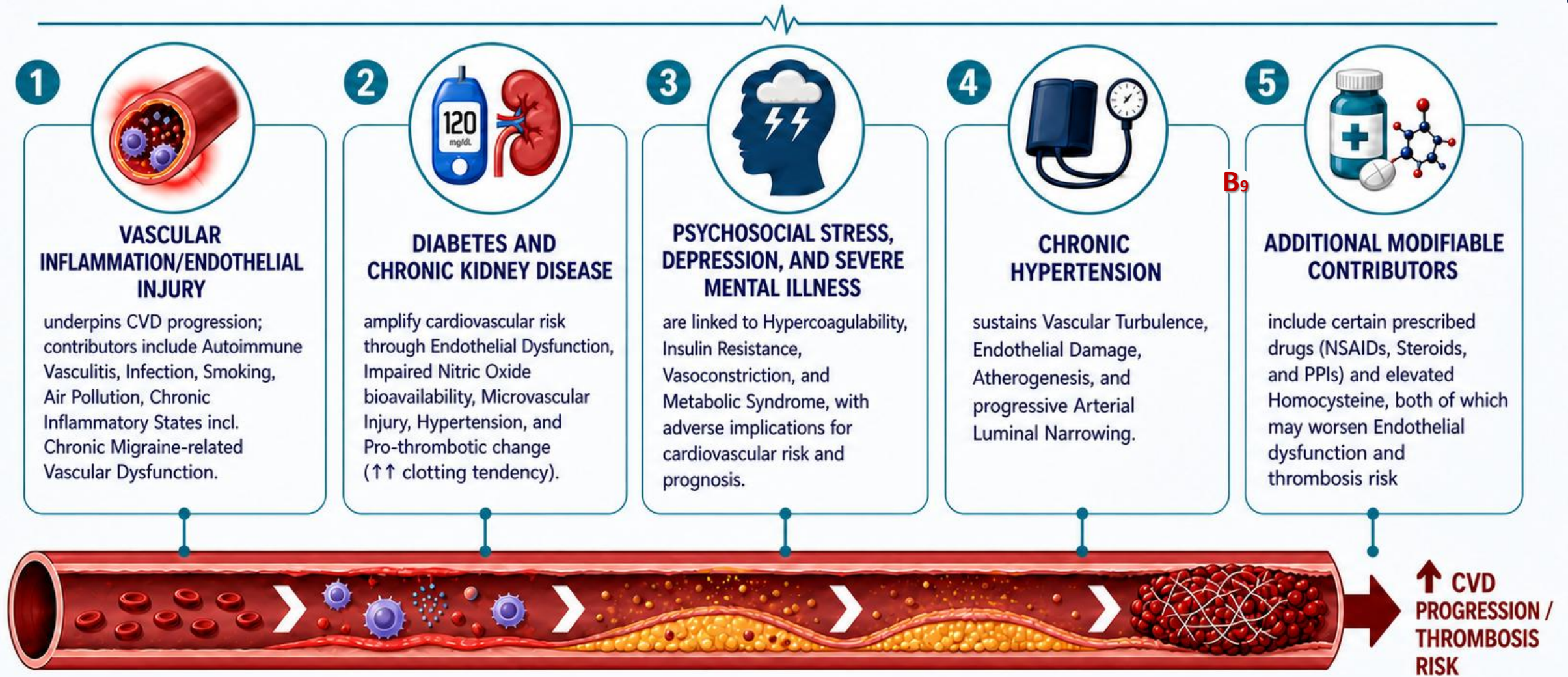
In other words.....**Atherosclerotic plaques** are essentially **BLOOD CLOTS**, “*in various stages of alteration and degeneration*”.

CONDITIONS NECESSARY FOR PLAQUES TO DEVELOP, GROW & DESTABILISE:

1. **INFLAMMATION** → **DYSFUNCTIONAL / WEAKENED +/- DAMAGED ENDOTHELIAL lining.**
2. **CLOT FORMED** is **LARGER +/- MORE RESISTANT TO BREAKDOWN.**
3. **REPAIR SYSTEMS** are **IMPAIRED / DIMINISHED**

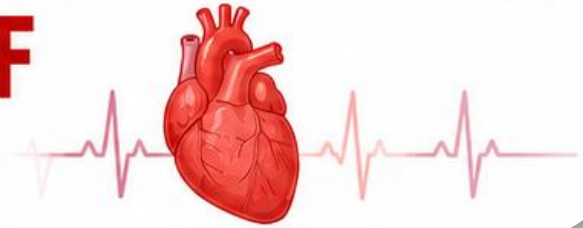
It is therefore fair to conclude that **any FACTOR that increases these CONDITIONS**, will most likely increase the risk of Cardiovascular Disease

KEY MECHANISMS DRIVING CARDIOVASCULAR RISK

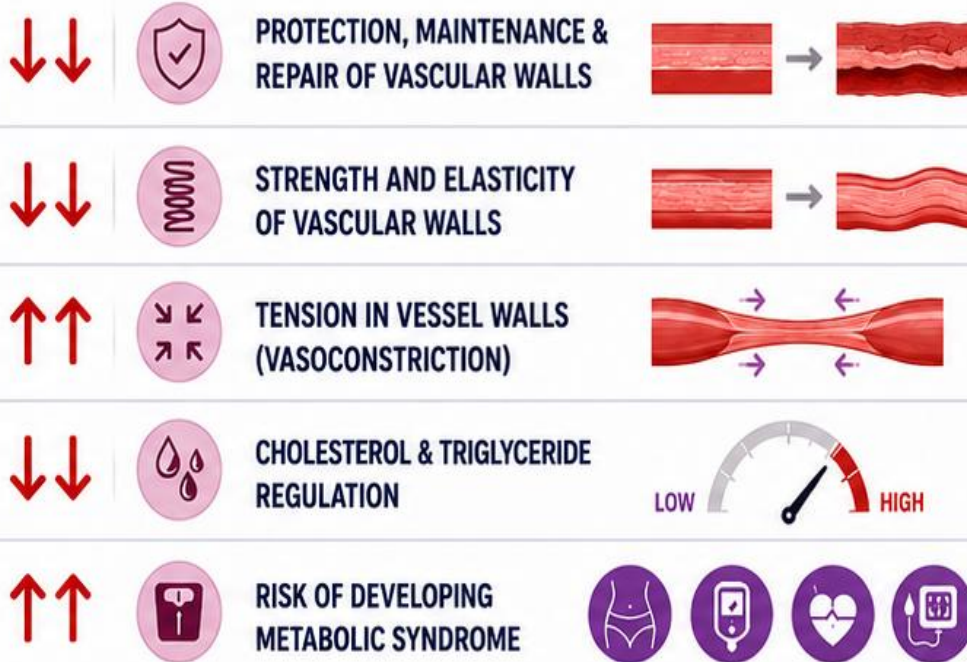


Key drivers include: Endothelial Injury, Inflammation, Metabolic Disease, Blood Pressure, and selected emerging / less conventional contributors to cardiovascular risk.

HOW MIDLIFE INCREASES RISK OF CARDIOVASCULAR DISEASE



DECLINING OESTROGEN & PROGESTERONE levels lead to:



DECLINING TESTOSTERONE levels further contributes to:



- LOSS OF MUSCLE MASS & STRENGTH**
Leads to higher body fat, insulin resistance and metabolic dysfunction.
- INCREASED VISCERAL FAT**
Visceral fat is metabolically active and promotes inflammation and insulin resistance.
- ADVERSE LIPID PROFILE**
Lower HDL (good cholesterol) and higher LDL (bad cholesterol) & triglycerides.
- ENDOTHELIAL DYSFUNCTION**
Reduced nitric oxide availability impairs vasodilation and blood flow.
- CHRONIC LOW-GRADE INFLAMMATION**
Promotes atherosclerosis and plaque instability.
- INCREASED RISK OF HYPERTENSION & CARDIOVASCULAR EVENTS**
Stronger association with heart attack, stroke and overall cardiovascular mortality.

TESTOSTERONE SUPPORTS:

- LEAN MUSCLE MAINTENANCE
- HEALTHY BODY COMPOSITION
- INSULIN SENSITIVITY & GLUCOSE CONTROL
- FAVORABLE LIPID BALANCE
- VASCULAR FUNCTION & BLOOD FLOW
- ENERGY, MOOD & OVERALL WELLBEING



THE CUMULATIVE EFFECT OF THESE CHANGES CONTRIBUTES TO
INCREASED RISK OF CARDIOVASCULAR DISEASE IN MIDLIFE AND BEYOND.



HEART ATTACK



STROKE



HEART FAILURE



PREMATURE
DEATH

PROTECTING & MAINTAINING the GLYCOCALYX & ENDOTHELIUM

— 1st line of defense! 🛡️ —



Glucosamine, Chondroitin and Collagen have all been shown to support and maintain the integrity and tonicity of vascular walls, just as they support and maintain joint tissues, thereby helping reduce cardiovascular risk while also supporting joints and other connective tissues.

GLUCOSAMINE & CHONDROITIN



Provide glycoproteins — the basic building blocks of the glycocalyx.



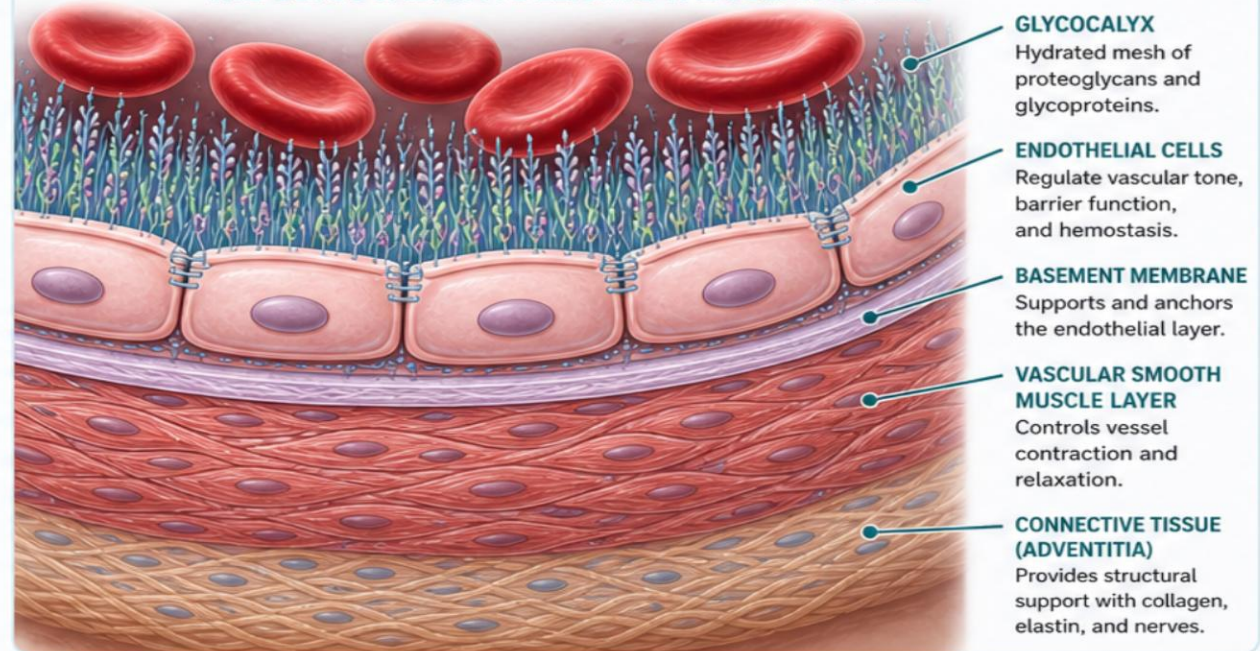
A 2020 national US cohort study confirmed that regular intake of glucosamine/chondroitin is associated with lower all-cause and cardiovascular mortality.

COLLAGEN



Supports and helps maintain the integrity and tonicity of vascular walls.

THE GLYCOCALYX: A DELICATE VASCULAR SHIELD



Supporting the glycocalyx and endothelium helps preserve vascular integrity, promote cardiovascular health, and support joints and connective tissues.



Reference: King, D.E., Xiang, J. and Du, C. (2020) 'Glucosamine/Chondroitin and Mortality in a US NHANES Cohort', *Journal of the American Board of Family Medicine*. Available at: [PubMed](#).

Antioxidant Support in CVD Risk Reduction & Management



Oxidative stress contributes to LDL Oxidation, Endothelial Dysfunction, Inflammation, and Atherosclerosis; antioxidant-rich foods and targeted nutrients may thus support **cardiovascular prevention** and **adjunctive management**.

1

ALPHA-LIPOIC ACID



Supports antioxidant recycling, raises glutathione, helps inhibit cholesterol oxidation, and may improve insulin sensitivity and mitochondrial energy metabolism.

2

COENZYME Q10

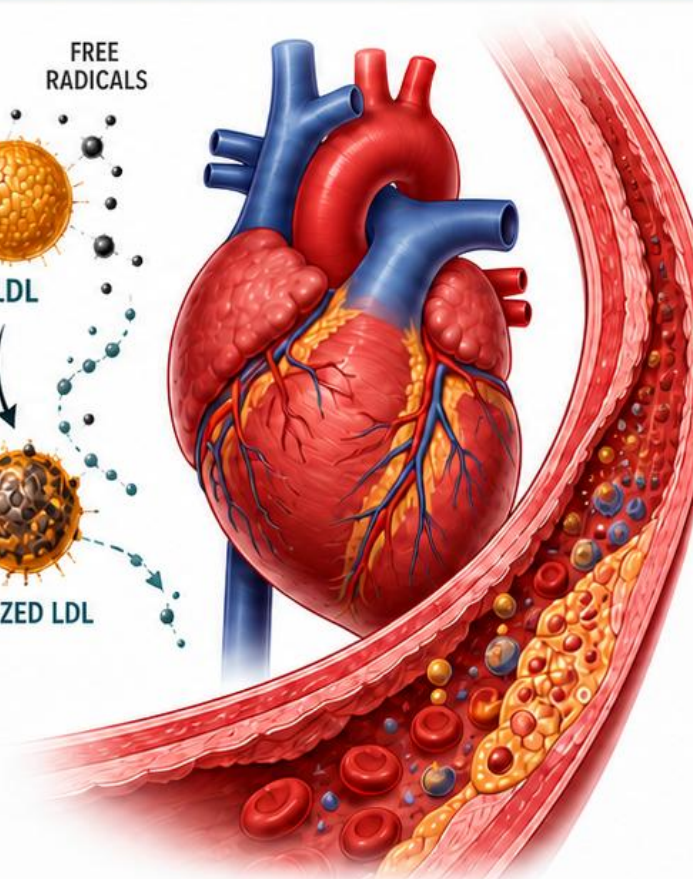


Relevant in cardiovascular support, particularly in statin users; note interactions with warfarin and additive blood-pressure lowering effects with antihypertensives.

FREE
RADICALS

LDL

OXIDIZED LDL



3

ASTAXANTHIN



Potent membrane-protective antioxidant supporting HDL cholesterol.

4

RESVERATROL, QUERCETIN & PROANTHOCYANIDINS



May help reduce atherosclerosis risk, support circulation, lower LDL damage, and stabilize blood pressure while improving microcirculation.

5

GREEN TEA/MATCHA CATECHINS



May support endothelial function and help improve blood sugar, cholesterol, and triglyceride profiles; matcha may contain up to 3x more EGCG than standard brewed green tea.

THE BRITISH PARADOX?

1



Catechins in green and black tea have **strong antioxidant activity**; tea polyphenols are readily bioavailable.

2



Why no British paradox? Milk may bind tea polyphenols and reduce measurable antioxidant activity.

3



Some studies report a **reduction in tea antioxidant capacity with milk**, with decreases varying by milk type and amount used.



2
cups black tea
(with milk)

=



1
glass red wine

=



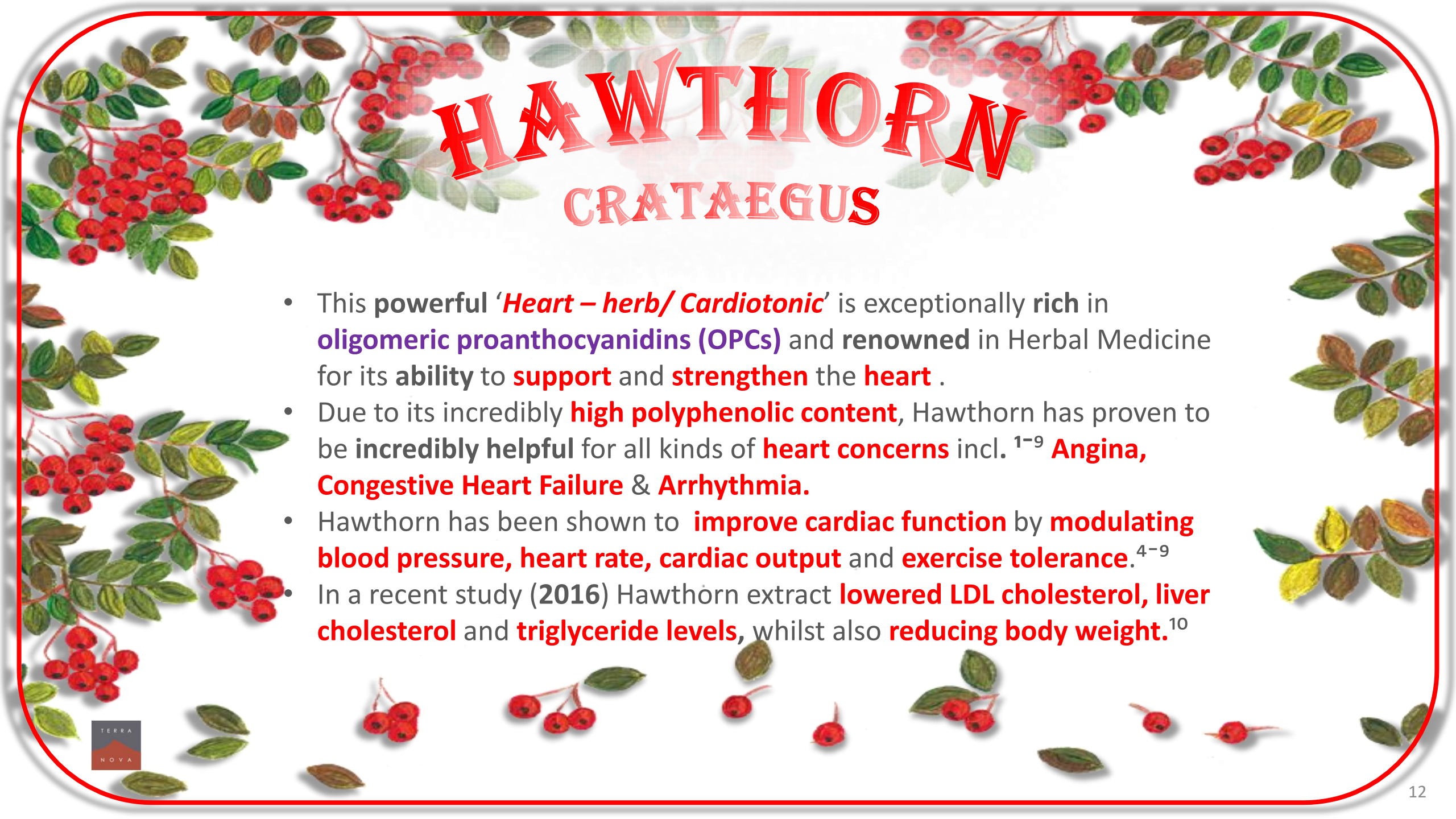
7
glasses orange juice

=



20
glasses apple juice

Examples adapted from Rouanet et al., Food Chemistry (2010) and milk-tea antioxidant studies.



HAWTHORN

CRATAEGUS

- This powerful '**Heart – herb/ Cardiotonic**' is exceptionally rich in **oligomeric proanthocyanidins (OPCs)** and renowned in Herbal Medicine for its ability to **support** and **strengthen** the **heart** .
- Due to its incredibly **high polyphenolic content**, Hawthorn has proven to be incredibly helpful for all kinds of **heart concerns** incl. ¹⁻⁹ **Angina, Congestive Heart Failure & Arrhythmia.**
- Hawthorn has been shown to **improve cardiac function** by **modulating blood pressure, heart rate, cardiac output** and **exercise tolerance.**⁴⁻⁹
- In a recent study (2016) Hawthorn extract **lowered LDL cholesterol, liver cholesterol** and **triglyceride levels**, whilst also **reducing body weight.**¹⁰

CURBING CLOTTING & VASCULAR CALCIFICATION

Clotting is necessary for repair, but excess clotting can worsen endothelial dysfunction and atherosclerotic risk.

1 PRACTICAL FACTORS



HYDRATION

Maintain optimal fluid balance.



MOBILITY

Avoid prolonged sitting or inactivity.



TEMPERATURE

Avoid extreme hot or cold shifts.

Address dehydration, immobility, and sudden temperature change; supportive options highlighted include omega-3 fish oils, garlic, and ginger.



2 PROTEOLYTIC ENZYMES



Supports fibrin breakdown, blood flow, and inflammatory balance; food sources: pineapple, papaya, ginger, fermented foods; **caution with anticoagulants.**



**HEALTHY VESSEL.
LESS CLOT BURDEN.
BETTER OUTCOMES.**



3 VITAMIN K2 (MK-7)



Activates osteocalcin and matrix Gla protein, supporting calcium placement in bone and limiting vascular calcification; **caution with anticoagulants.**



- ✓ Anticoagulant proteins S, C & Z: vital proteins that modulate thrombotic processes, thereby helping protect against thrombus formation and coagulation.
- ✓ Vitamin K2 may also exert anti-inflammatory effects by downregulating inflammatory pathways and cytokine release.

Helps direct calcium to bone, away from arteries.

Small, consistent actions support vascular health.



Supportive measures should complement, not replace, evidence-based cardiovascular care.



For Healthcare Professionals Only.

ADDRESSING METABOLIC DRIVERS OF CVD RISK

Target glucose regulation. Protect the vasculature. Reduce cardiovascular risk.

1

CINNAMON



Polyphenol-rich Ceylon cinnamon may support **antioxidant activity**, **insulin sensitivity**, **postprandial glucose control** and, in metabolic syndrome, improvements in **fasting glucose** and **systolic blood pressure**.

CHROMIUM

Trace mineral that supports insulin action, may enhance GLUT4-related glucose handling, and may help in insulin resistance, metabolic syndrome and adverse lipid profiles.



2

3

MAGNESIUM



Low magnesium status is linked with obesity, insulin resistance, metabolic syndrome and atrial fibrillation risk; magnesium also supports **carbohydrate metabolism**, **sleep**, **nerve signaling** and **cellular stability**.

Approximately 100 molecules of magnesium are needed to process 1 molecule of sugar.



METABOLISM



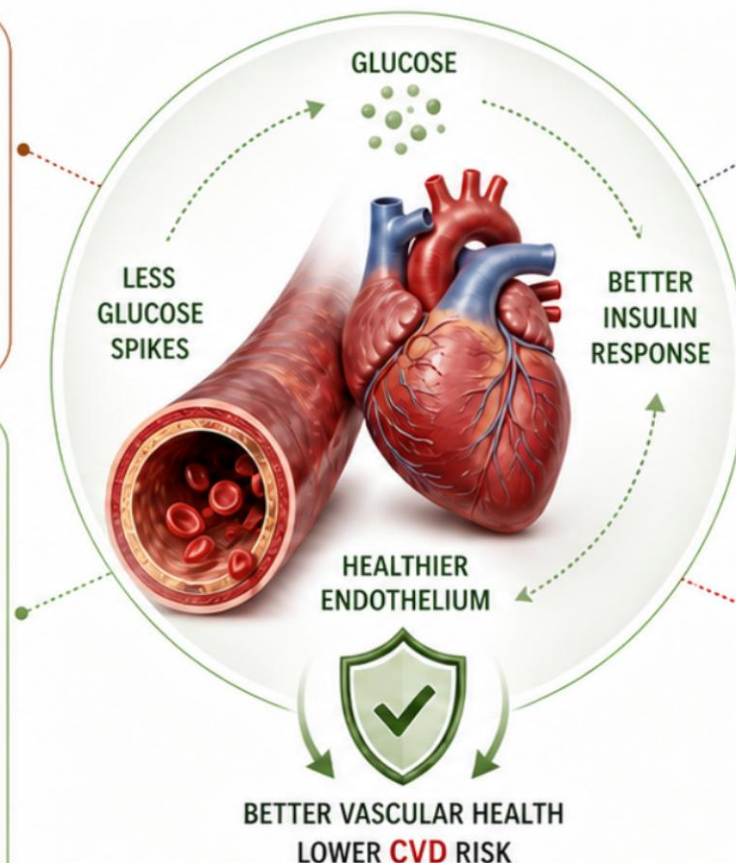
SLEEP



NERVE SIGNALING



CELLULAR STABILITY



LIFESTYLE / STRESS / GLUCOSE LOAD

Address **stress**, **sleep**, **exercise**, **refined carbohydrate excess** and **alcohol load** as core drivers of dysglycaemia and cardiometabolic strain.



4



Hypomagnesaemia has multiple causes, including **PPIs**, low dietary intake, processed food, stress, alcohol and caffeine.



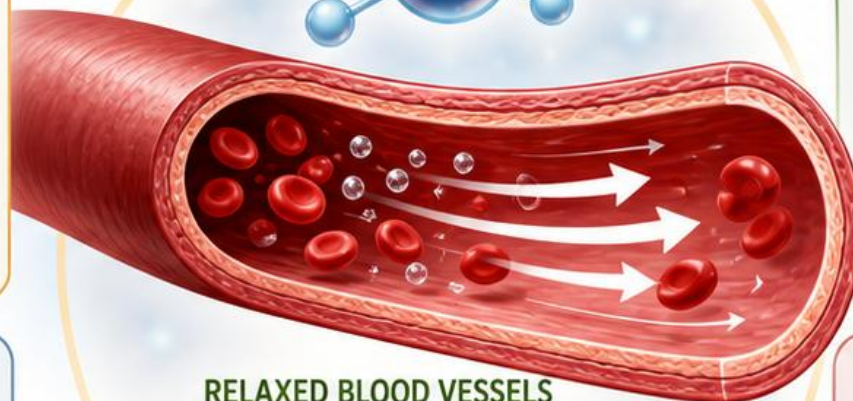
MANAGING HYPERTENSION RISK FACTORS

Prioritise nitric oxide support, magnesium status, sunlight, and lifestyle-based blood pressure control.



1. SUNSHINE

- ☀ Supports vitamin D and nitric oxide pathways;
- ☀ regular sunlight exposure is associated with **vascular and metabolic benefits**.



RELAXED BLOOD VESSELS
BETTER FLOW • BETTER HEALTH



2. NO-RICH FOODS & NITRIC OXIDE SUPPORT

- 🌿 Highlight foods like **beetroot, leafy greens, and garlic** for their nitrate, arginine or nitric-oxide-supporting effects.



3. MAGNESIUM & BLOOD PRESSURE



- ✓ Magnesium supports vascular relaxation, healthy nerve and muscle function, and stress balance.

About 100 molecules of magnesium are needed to process 1 molecule of sugar.

4. LIFESTYLE / KIDNEY / RAAS

- 🧘 **Reduce stress** – prioritise sleep, relaxation and mental wellbeing.
- 🏃 **Exercise** regularly – aim for 150 minutes/week of activity.
- 🌿 **Eat for BP** – more potassium-rich foods (vegetables, fruits, legumes), moderate sodium, avoid ultra-processed foods and excess alcohol.
- 👤 **Protect kidney health** – hydrate, limit excess salt & alcohol, manage blood sugar and body weight.



Severe hypertension requires medical assessment; **supportive strategies** complement, not replace, standard care.



LIPOPROTEIN(a) / Lp(a)

After major modifiable cardiovascular risk factors have been addressed, attention can turn to dyslipidaemia and elevated Lp(a), which is associated with a 2–3-fold higher cardiovascular mortality risk.

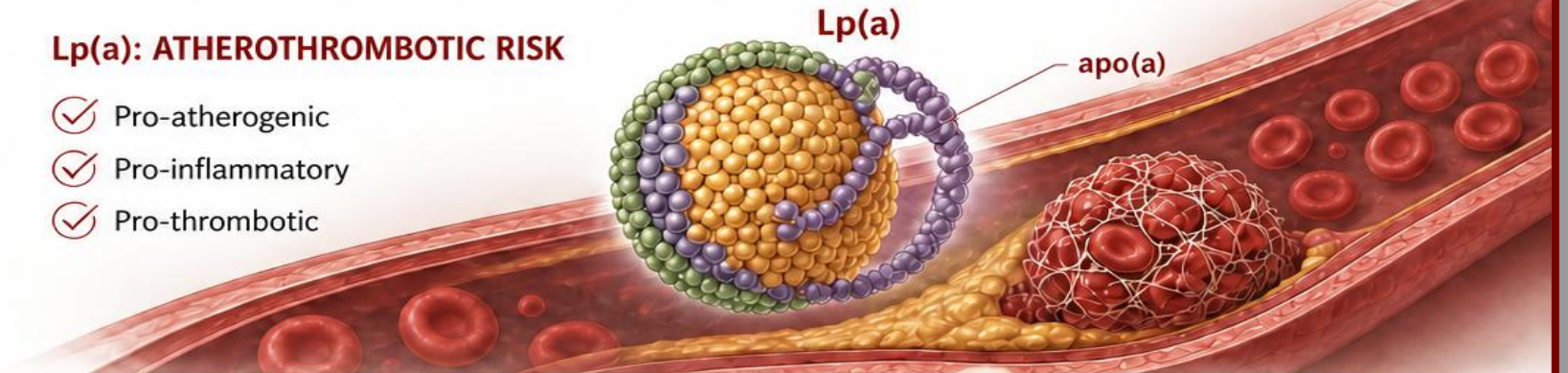
WHY IT MATTERS



Elevated Lp(a) is an independent cardiovascular risk factor with pro-atherogenic, pro-inflammatory and pro-thrombotic properties.

Lp(a): ATHEROTHROMBOTIC RISK

- ✓ Pro-atherogenic
- ✓ Pro-inflammatory
- ✓ Pro-thrombotic



1

PRACTICAL MEASURES

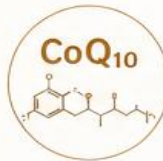
Adopt a low-carbohydrate diet; avoid smoking and unnecessary NSAID use.



2

TARGETED NUTRIENT SUPPORT

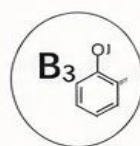
CoQ₁₀, vitamin C, and methylating nutrients where homocysteine is elevated.



3

LIPID-MODULATING SUPPORT

Niacin (B₃), red yeast rice, bergamot and plant sterols may provide benefit.



4

ASPIRIN CONSIDERATION

Low-dose aspirin may be helpful in selected patients with relatively high Lp(a), depending on bleeding risk and clinical context.



Lp(a) is largely genetically determined and not optimally lowered by lifestyle changes or statins.

Early identification and comprehensive management can meaningfully reduce residual cardiovascular risk.





RED YEAST RICE (ANKASCIN® 568-R)



Natural Fermented Red Yeast Rice Complex with Multi-System Health Benefits



WHAT IS IT?

- Produced by fermenting rice with *Monascus purpureus* (Red Yeast)
- Traditionally used for:



Supporting circulation



Promoting digestion



General cardiovascular wellness

CONTAINS BIOACTIVE COMPOUNDS:



Monacolins (including Monacolin K)



Monascin & Ankaflavin



Phytosterols, Isoflavones



Unsaturated Fatty Acids



B Vitamins & GABA

CLINICALLY OBSERVED BENEFITS OF ANKASCIN® 568-R

CHOLESTEROL



↓ **11.9%**

Total Cholesterol
Reduction

LDL CHOLESTEROL



↓ **20.4%**

LDL Cholesterol
Reduction

BLOOD PRESSURE



↓ **8.7%**

Systolic & Diastolic
Blood Pressure
Reduction

FASTING BLOOD GLUCOSE



↓ **9.3%**

Fasting Blood
Glucose Reduction



Improvements observed in randomized clinical studies within **4–12 weeks**.

KEY ACTIVE COMPOUNDS

MONASCIN + ANKAFLAVIN

Bioactive pigments unique to **ANKASCIN® 568-R** associated with:



Cholesterol
Modulation



Blood Glucose
Regulation



Blood Pressure
Support



Neuroprotective
Benefits



SAFETY PROFILE



No significant changes
in AST/ALT liver markers



No toxic effects reported
when used alongside:

- Lovastatin
- Pioglitazone
- Amlodipine



More than **10 years** of research
and **120+** scientific publications



COGNITIVE HEALTH BENEFIT

- ANKASCIN® 568-R significantly
reduced Amyloid Precursor
Protein (APP) expression in
immunohistochemistry studies.



May support memory
and cognitive health.



TAKEAWAY

ANKASCIN® 568-R is a clinically studied Red Yeast Rice ingredient that supports **cardiovascular, metabolic, and cognitive health** through multiple bioactive compounds while demonstrating a **favorable safety profile**.



These statements have not been evaluated by the Food and Drug Administration.
This product is not intended to diagnose, treat, cure, or prevent any disease.

SOURCE: <https://fermedics.com/botanicals/ankascin/>

ANKASCIN® 568-R



BERGAMOT & PLANT STEROLS (STEROLINS)

— Natural Compounds Clinically Shown to Lower Cholesterol & Support Cardiovascular Health —



BERGAMOT (*Citrus bergamia*)



Fragrant citrus fruit. Essential oils & extract from peel and juice used in Traditional Medicines to support the Immune & Cardiovascular systems.¹⁻⁸



KEY PHYTONUTRIENTS & BENEFITS



FLAVONOIDS → Bruteridin, Melitidin
Inhibit HMG-CoA reductase.⁵



GLYCOSIDES → Neoeiocitrin,
Naringin & Rutin



Help lower Total Cholesterol,
LDL Cholesterol & Triglycerides
and Blood Glucose.⁶⁻⁸



**Supports management of atherosclerosis
and protects LDL from oxidation.**⁶⁻⁸



PLANT STEROLS & STEROL ESTERS (STEROLINS)

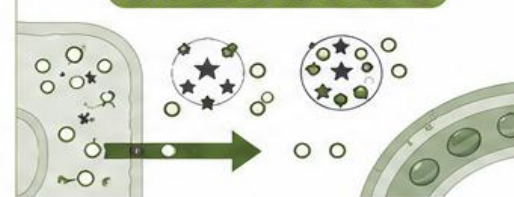


Natural plant fats found in veg oils, nuts, grains, seeds, leaves & wood pulp.
Molecular structure similar to cholesterol.



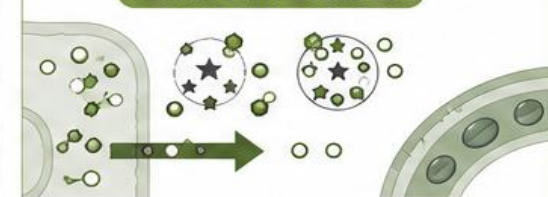
HOW THEY WORK (INTESTINAL ACTION)

WITHOUT PLANT STEROLS



More cholesterol is absorbed.

WITH PLANT STEROLS



< 5% cholesterol is absorbed;
more is excreted in bile.

○ Cholesterol

★ Bile Salts

● Plant Sterols

⊙ Mixed Micelles



CLINICAL EVIDENCE & EFFECTIVENESS



Multiple clinical trials show
benefits within
30 days to 12 weeks.

BERGAMOT EXTRACTS



↓ Total Cholesterol by ~6–10%



↓ LDL Cholesterol by ~8–15%

PLANT STEROLS / STEROLINS



↓ Total Cholesterol by ~6–10%



↓ LDL Cholesterol by ~8–15%
(HDL & Triglycerides not affected)



EFFECT IS DOSE-DEPENDENT

- ≥ 0.8 g sterol/day for significant benefit
- 2 g/day is the optimum daily dosage



SAFE & WELL TOLERATED: Well tolerated in studies from **30 days to 12 weeks.** No major safety concerns reported.



TAKEAWAY

Bergamot's flavonoids & glycosides plus Plant Sterols (Sterolins) work through complementary mechanisms to **reduce total cholesterol & LDL**, support heart health, and are well tolerated.

OMEGA FATS

Omega 3, Omega 6, Omega 7 & 9 are an *essential* part of the membranes surrounding every cell in the body and the **100 billion NERVE** cells that make up the Brain.

Optimal **communication** between cells & **nerve signalling** is dependant on having **healthy cell membranes**



- ❌ **Trans-Fatty Acids (TFAs) & Hydrogenated Vegetable Oils**, found in *Fried Food*, *Margarines* & *Refined Confectionaries*, affect the use of **Omega fats** by:
 - ❌ **BLOCKING** the **uptake** of **Omega fats**.
 - ❌ Creating **molecules** that **DAMAGE Omega fats**.
 - ❌ **Pollution, Smoke & Radiation**, also **damage Omega fats**.
- May all be **avoided/ reduced** through
 - ↑ **Omega** Supplementation &
 - ↑ **Antioxidant** use



ADDRESS THE STRESS



Address **NUTRIENT & DIETARY DEFICIENCIES**, thus providing the **Fuel & Tools** needed to support **FUNCTION & STRUCTURE** (eg. Vit B & C, Magnesium & Zinc)



Then consider using **ADAPTOGENIC BOTANICALS** (*Herbs & Plants*) to help re-establish **BALANCE / HOMEOSTASIS**



Finally, **Maintain** this **BALANCE** by applying bespoke, **LIFESTYLE MODIFICATIONS** like **YOGA¹, MEDITATION & RELAXATION¹⁻²**



TOOLS & FUEL

Nutrients & Diet
support Function & Structure



RESTORE BALANCE

Adaptogenic Herbs & Plants
help re-establish Homeostasis

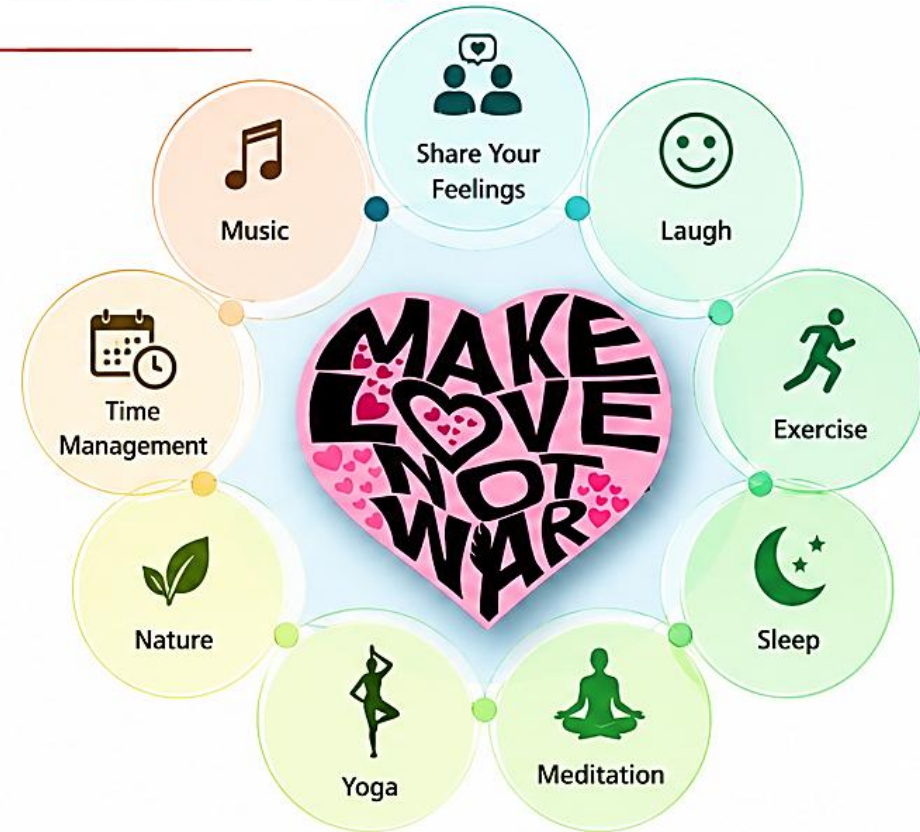


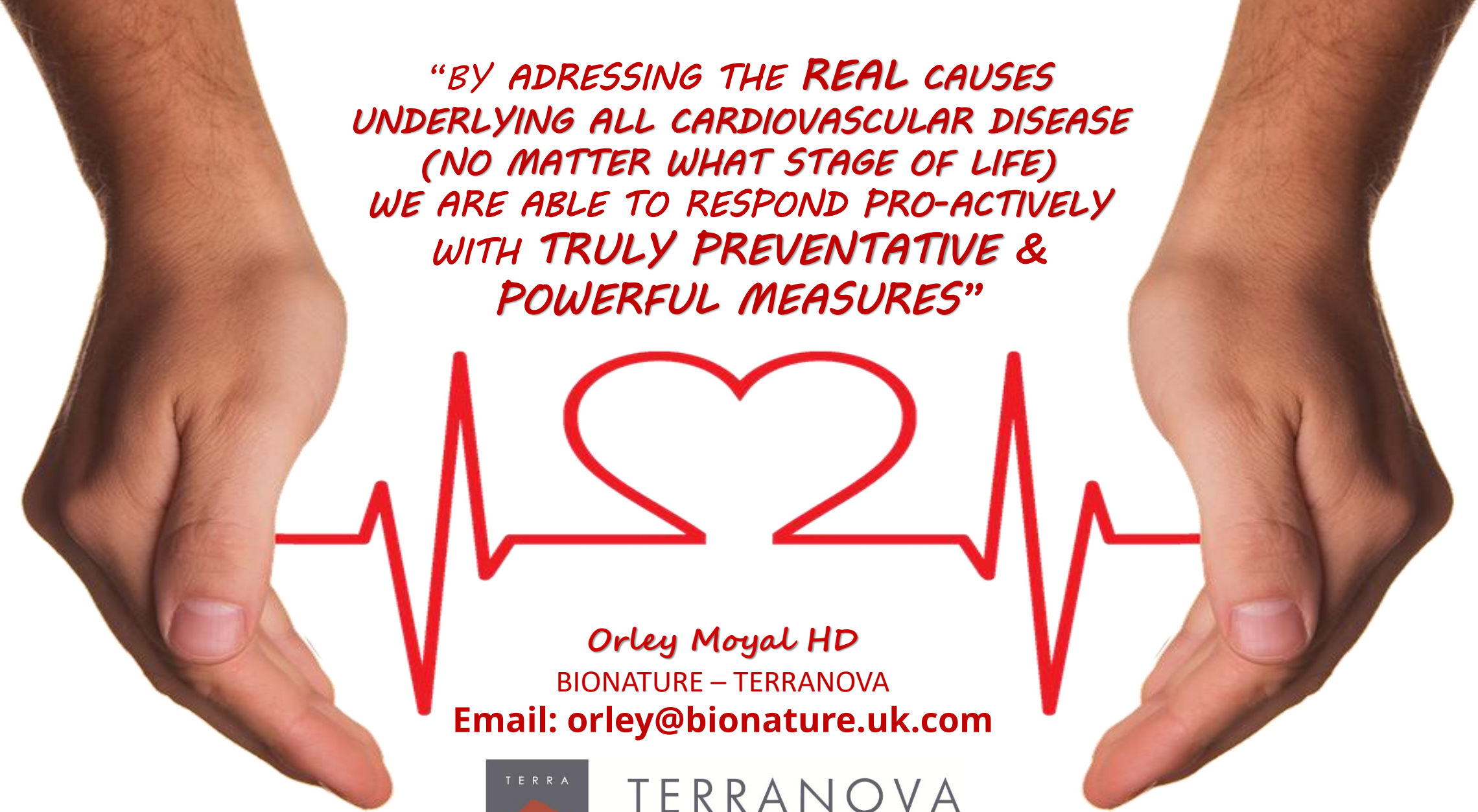
SUSTAIN BALANCE

Lifestyle Modifications like
Yoga, Meditation & Relaxation



A balanced body
and mind are the
foundation of
long-term health.



A graphic featuring two hands, one on the left and one on the right, holding a red heart. A red line representing a heartbeat (ECG) starts from the left hand, goes up and down, then forms the heart shape, and continues with another heartbeat line to the right hand.

***“BY ADRESSING THE REAL CAUSES
UNDERLYING ALL CARDIOVASCULAR DISEASE
(NO MATTER WHAT STAGE OF LIFE)
WE ARE ABLE TO RESPOND PRO-ACTIVELY
WITH TRULY PREVENTATIVE &
POWERFUL MEASURES”***

Orley Moyal HD
BIONATURE – TERRANOVA
Email: orley@bionature.uk.com



TERRANOVA
SYNERGISTIC NUTRITION