THE TRUE CAUSE OF HEART ATTACKS

In people who are metabolically healthy, eating a lower carbohydrate diet has been shown to create elevations in their LDL, (the so-called "bad" cholesterol) **and total cholesterol, but this tends to occur in the context of otherwise low cardiometabolic risk. Long term higher LDL in these individuals does not result in the development of plaque in the arteries of the heart.**

In fact, LDL cholesterol is not associated with higher rates of cardiovascular disease (CVD)**. The idea that high cholesterol levels in the blood are the main cause of CVD is impossible because people with low levels become just as atherosclerotic as people with high levels, and their risk of suffering from CVD is the same or higher. Seventy-five percent of people admitted to the hospital having a heart attack have normal or optimal LDL levels, and a growing number of heart attack events are happening in people without high cholesterol.**

LDL cholesterol and total cholesterol in the blood do not reflect risk for heart disease. Measuring cholesterol in the blood provides insight about only the current metabolism taking place. Blood lipid levels increase when relying on fat for energy (a lower carbohydrate diet) **and decrease when including more glucose and other carbohydrates for a fuel source. Thus, the focus on lowering LDL to prevent heart disease is not likely to be effective.**

Twenty-one clinical trials on the efficacy of cholesterol-lowering medications for preventing heart disease and heart attacks found that cholesterol-lowering drugs have very little benefit and their benefits are largely over-stated, due to misleading statistical presentation of the data in the studies.

It is clear that the medications and procedures that Western medicine uses to prevent heart attacks are not working and are one of the reasons why heart disease remains the number-one killer in the world. The conventional theory of what causes heart attacks is that cholesterol builds up in the arteries of the heart in the form of plaque and slowly blocks an artery. However, if total cholesterol and LDL-cholesterol are just a reflection of metabolism and are not the cause of heart disease, and if lowering them doesn't prevent heart disease, what does cause plaque to develop in the arteries? We know that cholesterol is not the driver of plaque formation, but plaque does still occur.

There is plentiful research suggesting that atherosclerotic plaque in the walls of arteries is a result of a clotting response in the blood. Fibrin (clotting tissue) **appears to be a multi-potential component of atherogenesis, intervening at virtually all stages of lesion development. Fibrin is more or less the same clotting tissue response that forms in response to damage to your skin, such as a scab to stop bleeding. The composition of plaque is about 87% fibrotic clotting tissue. In individuals with genetically-high cholesterol, some of them developed plaque and some of them didn't, the difference was that those who developed plaque had a genetic predisposition to elevated clotting factors in their blood.**

In 1856, Rudolf Virchow showed the world that what causes pathological clotting in the blood is damage to the lining of a blood vessel, inadequate or altered blood flow and a situation where the blood becomes too thick or viscous. Allopathic medicine still generally accepts these as the causes of clotting.

Allopathic medicine's theory of heart disease says that if enough plaque builds up, it could lead to restricted blood flow and cause chest pain (angina) **or block the artery enough to cause a heart attack. The thinking is that unstable or soft plaque could rupture and cause an acute blockage. However, even with the presence of plaque, neither one of these situations is likely to cause a heart attack.**

There are various tests used to measure the amount of plaque in the arteries of the heart and how narrowed the pathway for blood has become due to that plaque. One such test is a *coronary artery calcium* (CAC) **scan, which measures the amount of calcified plaque in the arteries. Studies show that the higher the CAC score, the greater the risk of a heart attack. The conventional explanation is that this is because more plaque in the arteries increases the chances of someone getting to the point where an artery closes or the plaque ruptures and causes a heart attack. However, the work of Italian cardiovascular pathologist Giorgio Baroldi forces us to question these ideas.**

THE BODY KNOWS WHAT TO DO

Dr. Baroldi spent most of his career investigating the coronary arteries, but the field of cardiology has largely ignored his work. He developed a method to cast the arteries of the heart in autopsy with a plastic material so that when he dissolved away the heart tissue, he was left with a perfect representation of the arterial system of the heart, including very small arteries that do not show up on angiogram imaging.

When he studied the casts, he was astonished. Any time the narrowing of an artery due to plaque got to about 70%, the body build collateral arteries around the narrowing that fully compensated the heart tissue with blood. Any severely obstructed coronary artery lesion, even multiple ones, was always found associated with enlarged collaterals. These collateral arteries can form very quickly, within 4 - 7 days.

Conventional medicine says that in a heart attack, a rupture of plaque occurs, which initiates a clotting response large enough to block the artery instantaneously. However, a review of evidence on the plaque rupture theory of heart attacks found that while plaques do rupture, the ruptures cause heart attacks much less frequently than generally thought, with an estimated event rate associated with each plaque of only 0.06% per year. The clotting tissue formed to heal them contributes to further narrowing of the artery with plaque. But if this happens over time, the body will build collaterals to ensure that the heart tissue gets enough blood.

This and the fact that plaque ruptures are rarely the cause of heart attacks help explain why the procedures that Western medicine uses to try to prevent future heart attacks—like placing preventive stents (to open up a narrowed artery) **or conducing by pass surgeries** (using a vein to direct blood around a narrowing)**—are not achieving their stated aim.**

If the body is going to build collaterals and maintain blood flow, and if plaque ruptures rarely cause heart attacks, then opening up a narrowed artery with a stent or creating a new route with a bypass is not going to help. These procedures do seem to alleviate symptoms in some people, but they should never be done for the sake of trying to prevent heart attacks in those without symptoms. The continued use of expensive and profitable procedures that do not prevent future heart attacks are the elephant in the room in cardiology.

NO BLOCKAGE HEART ATTACKS

Medicine should shift away from treating narrowing in the arteries and instead focus on preventing clotting in the arteries. Structured water and infrared light protect us from atherosclerosis through their prevention of clotting. One of the biggest risk factors for clotting in the bloodstream is stagnant or interrupted blood flow. When a heart attack happens, heart tissue dies, generally thought to be from a lack of blood to that area of the heart. As it turns out, another type of heart attack, called "myocardial infarction with non-obstructing coronary arteries" (MINOCA)**, that happens without any blockage.**

Although allopathic medicine seems to have no real understanding of the causal mechanism and generally considers this type less common, MINOCA may be much more common than acknowledged.

THE ROLE OF STRESS

The cascade of events that leads to MINOCA is largely triggered by a dysfunctional stress response in the autonomic nervous system (ANS)**. Our evolved stress response is supposed to be activated only when it needs to be** (such as when our life is in danger)**, but the mismatch between how our stress response evolved and our unnaturally stressful modern environment can cause the stress response to become imbalanced.**

Instead of healthily going back and forth between a stress response and a non-stress state, we can get stuck on constant high alert, (especially with a cell phone in the pocket, or having WiFi or Bluetooth microwaves slamming your body, and artificial junk, blue lighting) **altering ANS signaling. This could explain why heart attacks are more prevalent on stressful days of the year and on Mondays when people go back to work, as well as why heart attacks spike around the time of the daylight savings time change, which is stressful to our nervous system.**

The ANS consists of two parts: the "rest and digest" (*parasympathetic*) **side, which is more active in non-stress situations, and the "fight-or-flight"** (*sympathetic*) **side, reserved for those times when a stress response is necessary. Normally, a surge in one includes a lesser surge of the other to maintain balance. The signal for this system is conducted through the *vagus* nerve. Although a combination of factors has to converge for a heart attack without a blockage to occur, an out-of-balance ANS is a key trigger.**

The control of ANS balance in heart tissue relies on two messenger molecules: cAMP and cGMP. cAMP levels rise in the heart cells when we have a stress-response, and cGMP levels rise when we are in a relaxation state. When it comes to cGMP (the relax molecule)**, there is one critical difference: nitric oxide or NO** (produced in the cells of the walls of arteries called *endothelia*) **is needed to increase its levels. When we experience a stress response and the nervous system causes spikes in cAMP within the heart, then—provided there is enough NO—cGMP also increases to keep the system in balance.**

When we have prolonged periods with surges of stress responses that increase levels of cAMP, and there is not enough stimulation of the relax response, then we can lose the ability to move effectively between the two states and can get stuck in a stress state. This is called "decreased vagal tone" because the vagus nerve carries the non-stress signals.

Heart Rate Variability (HRV) **is the best measure of balance in our stress response. The higher a persons HRV, the more balanced they are. Interestingly, one study showed the complete suppression of HRV preceding 95% of ischemic heart attack events. When our stress response becomes imbalanced, the failsafe within the cardiac cells is supposed to be that consistently high levels of cAMP are balanced by also raising levels of cGMP. Again cGMP can do this only if NO is present. If NO gets depleted because our body is in an inflammatory state or the lining or the artery is impaired, this can increase the chances of having a stress response without the balance of the non-stress response.**

THE BIG EVENT

When humans experience decreased vagal tone for long periods while also experiencing decreases in NO levels, this can cause a surge in the stress response and subsequent elevation in cAMP in our heart cells without a balanced rise in cGMP. This can set into motion the cascade of events that is a heart attack without a blockage.

The sudden, unchecked rise in adrenaline from the stress response causes an increase in lactic acid production within cardiac cells. This happens because the stress response situation persuades the heart, which usually prefers to burn fatty acids and ketones, that it needs to burn energy more quickly. It is quicker to burn glucose than to burn the more efficient and preferred energy source of fats and ketones.

Burning glucose causes a build-up of lactic acid and hydrogen ions within the heart cells, creating a state of acidity. The production lactic acid is increased by a factor of eight in this situation, with no change in oxygen levels. This is similar to doing a sprint or a hard, fast workout; lactic acid builds up in the muscles, causing the muscles to have that burning feeling, but oxygen levels are not affected.

In the legs or arms, if we stop moving the muscles, the lactic acid will move along, discontinuing the build-up and the burning. However, the heart can't just stop contracting, so the rapid build-up of lactic acid in the heart tissue causes a major problem, preventing calcium from being able to bind to muscle fibers to create contraction of the heart muscles. Low calcium in heart cells results in slower conduction velocity and elevated arrhythmia risk. This eventually leads to decreased muscle tension and contractility, which then causes a stretching of the wall of the heart that leads to increased pressure. The increased pressure in the tissue prevents blood supply from getting to the tissue. This results in very quick tissue death before any drop in oxygen is seen in heart tissue—in other words, a heart attack.

MAINTAINING HEART HEALTH

The strategies used to create the best chance for heart health are helpful in preventing heart attacks in both scenarios—the *acute clotting* scenario and the *unbalanced stress response* scenario. To decrease risk of acute clotting, we should do things that help keep blood moving and keep it from getting too thick or viscous. To decrease risk of an unbalanced stress response, we should do things that improve HRV. There are strategies that do both of these things.

The strategies that have the most impact on the causes of heart attacks are not diet-related. The most important to focus on are sunlight and grounding. For life on Earth to sustain itself, it needs to harvest energy from its environment and use it to create the order we call "health." The source for all the energy for life on Earth is the sun. Thus, it makes sense that sunlight exposure would be good for us. The sun emits 40 to 50% infrared light any time it is "up," and infrared light is most effective at structuring water in the body. Structured water in blood vessels is a primary driver of blood flow. Getting sunlight has been shown to increase blood flow in the body. Further, getting sunlight exposure and setting your body to the day/night cycle of the sun (by being cognizant of artificial light exposure when the sun is not up) **have been shown to improve HRV.**

Far-infrared saunas and red/near-infrared light panels are other ways to boost infrared light exposure if you are unable to get enough sunlight. Near-infrared light therapy and far-infrared saunas are both effective at increasing blood flow. Sauna use also increases HRV.

Grounding is another way to gain energy from the sun. The sun continuously transfers electrons into the ionosphere (the upper atmosphere of Earth that holds ions)**. Our bodies are photo-electric, like plants, and one photon of sunlight breaks down to 2 electrons in the body. During times of excitement** (storms)**, lighting discharges ions and keeps the earth full of negatively-charged energy.**

Physics teaches us that when two conductive entities touch each other, if there is a difference in charge between the two, electrons will flow from the entity with the higher concentration of energy into the entity with the lower concentration. Living creatures are conductive surfaces, and the earth is a conductive surface. When we put bare skin on the ground, we soak up electrons through the hydrated fascia network in our body, and these are transported to be used in the mitochondria of any cells that need it.

Direct contact with the earth is the best way to ground, but there are also devices that connect to the grounding wire of an indoor power outlet. These are often used in research studies. Studies have shown that after six weeks of grounding, the HRV was much higher on average in the grounding group, versus the

control group. Other studies investigated the effects of grounding on vagal tone (HRV) **and survival in infants born preterm. Vagal tone increased 67% and improved the infants' resilience to stress** (and therefore, their ability to survive)**. One study tested the effects of grounding on HRV by grounding subjects for forty minutes, designing the study so that participants did not know who was being grounded and who was in the control group. The grounded group experienced an increase in HRV that continued to improve throughout the forty minutes of the experiment. These studies clearly illustrate how connecting to Earth's electrical field can improve HRV and increase coherence.**

Grounding increases blood flow, conducting energy not just local to the surface of the body, but throughout the body. Grounding also increases the structured water found on the elements of the body, called *zeta potential*. Maintaining a strong electrostatic attraction between the fluids in the body and the elements in that fluid—by maintaining the zeta potential of the blood elements—increases blood flow and keeps blood from clumping together and clotting.

Sunlight and grounding are important because they are done outside. It is no accident that the rise of heart disease and heart attacks seen since the 1950s correlates with the invention of brighter indoor lighting, which has led to a life lived to an ever greater extent indoors (without sunlight)**. The average person today spends about 93% of his time either inside or in an enclosed vehicle. Our bodies are starving for the energy that we get from being in the sun with our feet on the earth.**

Discussion about the prevention of heart disease and heart attacks tends to be dominated by the topic of diet. This is mostly due to the unfounded linking of heart disease with cholesterol and the fact that cholesterol is found in food. The only way that diet con contribute to heart disease is if someone is eating a processed-food diet, full of toxins. Especially if they are eating indoors under artificial lighting. The most important thing to do is to center the diet around naturally-raised animal foods and whole plant foods in season.

Many things will improve our health and prevent disease. In addition, to eating whole foods in season, factors include staying hydrated, avoiding toxin exposure, resolving past traumas, exercising, expressing gratitude and avoiding non-native electromagnetic signals. The most important thing to do is spend more time outside. This is the way it was for humans before our modern way of life.