



In this book Dr. Matthias Rath, a leading diseases and nutrition and the founder of his revolutionary findings: Vitamin deficiencies are the primary cause of heart attacks and strokes and these diseases can now be eradicated. Grateful letters from patients prove the success of following Dr. Rath's nutritional recommendations for optimum cardiovascular health:

- "I am happy to report that your cardiovascular health recommendations have improved my life! Now I can climb the stairs readily and without shortness of breath. I can also resume hiking for 3-4 miles a day without feeling tired and exhausted. I do have an energetic outlook towards life and I am sure it's due to your recommendations." *A.G., USA*
- "Two months ago, I was experiencing loud heartbeats, tachycardia and irregular beating of the heart. I began to follow your cardiovascular health recommendations. What a smart decision that was! Within a few days, the tachycardia stopped and I've not experienced any loud or irregular heartbeats." *B.M. USA*
- From a patient's letter to his doctor: "I can't wait to see you in six weeks. Since following Dr. Rath's recommendations, I have had no angina. This past May I walked and climbed the rugged ocean trails of the rain forest without so much as a twinge. In closing, I and my family are very pleased and would like to thank you." *J.T., Canada*
- "I am grateful for your cardiovascular health recommendations. I feel that you have made a tremendous scientific breakthrough in the treatment of heart disease." *M.L., USA*

Dr. Rath's recommendations help improve the health of patients with severe heart conditions. Imagine how they could improve your personal health!

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Canada \$18.25

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RATH → ERADICATING HEART DISEASE

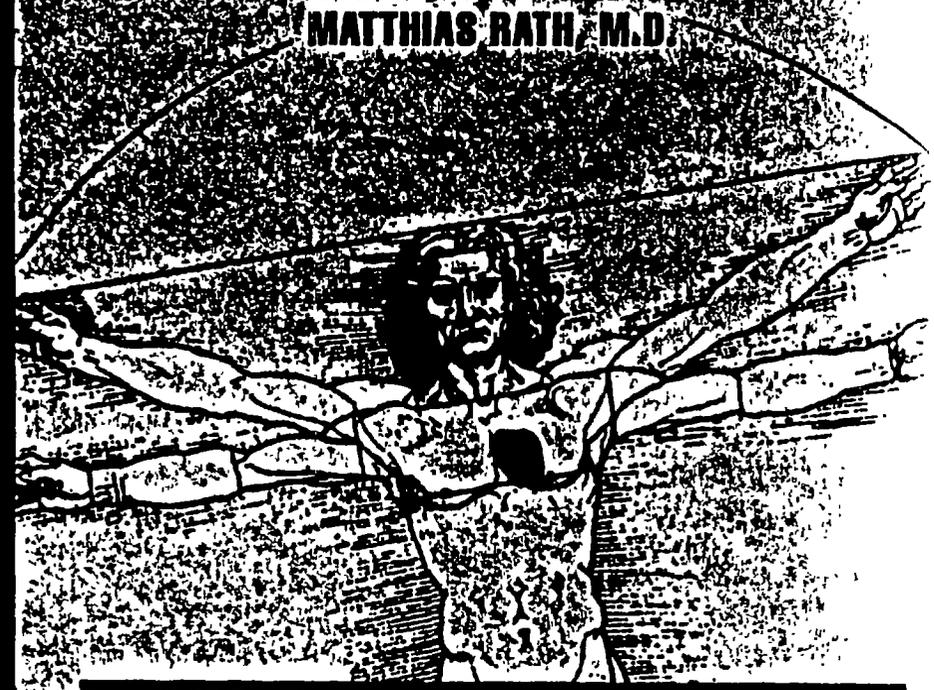
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(MATHIAS)

THE MOST IMPORTANT BOOK OF YOUR LIFE

# ERADICATING HEART DISEASE

MATTHIAS RATH, M.D.



Heart attacks and strokes are not diseases — they are caused by vitamin deficiencies. America's number one killers can be prevented by an optimum intake of essential nutrients. This book shows you how.



Ⓟ

## HOW YOU CAN BENEFIT FROM READING THIS BOOK

- **This book is a handbook for optimum cardiovascular health.**

It is an educational book about the number one killer in America.

It contains many illustrations and pictures for better understanding.

It explains how your body functions during health and during disease.

It summarizes the most important heart disease studies and the benefits of vitamins.

It gives my personal recommendations for optimum cardiovascular health.

Most importantly, it shares with you the astonishing health improvements from patients who have already been following the health recommendations of this book.

- **You can improve your health.** Heart attacks and strokes are vitamin deficiency diseases. They are essentially unknown in the animal world, especially in those species that manufacture optimum amounts of their own vitamin C. If you know which vitamins to take and in what amounts, you can prevent heart attacks, strokes, and many other diseases. This book gives first hand answers to your most important questions about heart diseases.

- **You will obtain the latest scientific information on**

How to prevent heart attacks

How to prevent strokes

How to fight angina pectoris, the chest pain from heart disease

How to reduce the clogging of blood vessels after bypass surgery

How to reduce high cholesterol levels

How to alleviate the risk from lipoprotein-a, a newly identified risk factor  
for heart disease - ten times greater than cholesterol

How to prevent blindness and kidney failure in diabetic patients

How to lower high blood pressure

How to fight heart diseases caused by stress, smoking and other factors

The answers to these and other important questions will make this book an invaluable source of information for the rest of your life.

- **You can optimize your health with safe nutritional supplements.** Vitamins, minerals, and other essential nutritional supplements are products of nature. These compounds have effectively maintained health over millions of years. Nutritional supplements can help your body function better without increasing the risk for undesirable side effects.

- **You could increase your life expectancy.** The human body is as young as the walls of its blood vessels. You will learn how to protect your blood vessel system, the largest organ of the human body. Maintaining the stability and flexibility of the blood vessels is an important goal in preventing premature aging of your body. This book describes how you can prevent early aging and achieve a longer and healthier life.

- **You can save money.** Nutritional supplements are not only a very effective way to maintain your health, but also a very economical way. The daily amount of nutritional supplements necessary to prevent heart attacks and strokes costs only a few dimes.

- **You can take better charge of your own health.** This book does not only give you advice for optimum cardiovascular health, it also shares with you the proof: the amazing health improvements of people who have been following the recommendations of this book. This book has been written to encourage you to take better charge of your own health.

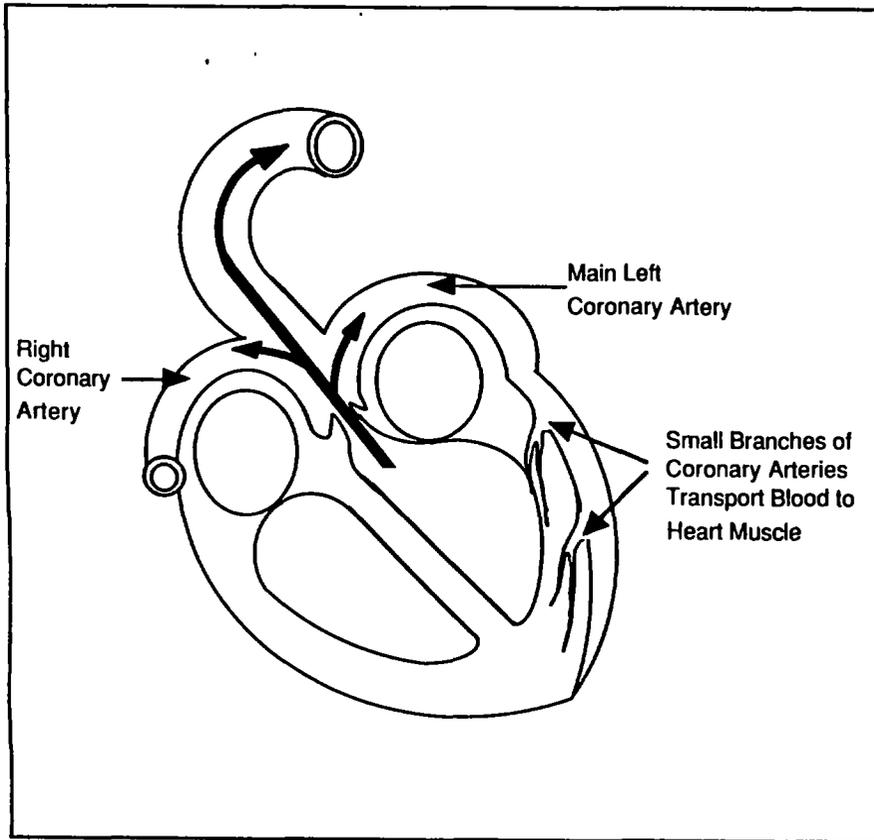
- **You can help your loved ones.** This book contains information important to every human being. Share this information with your family, your friends, your neighbors. The medical discoveries reported in this book are also important for their health and their lives. Your loved ones will be grateful to you for passing on this information.

- **You can make all the difference.** The first report that vitamin deficiency is a primary cause of heart attacks and strokes was published more than 50 years ago. Ignoring this report cost the lives of over half a billion people, more than in all wars of mankind together. This unnecessary dying can be stopped, with your help.

Presently, the U.S. Food and Drug Administration is trying to limit the free access of the American people to vitamins, amino acids and other nutritional supplements by making them prescription drugs. By doing so, this federal agency does not serve the interests of millions of Americans who would be deprived of an effective, safe, and affordable way to improve their health.

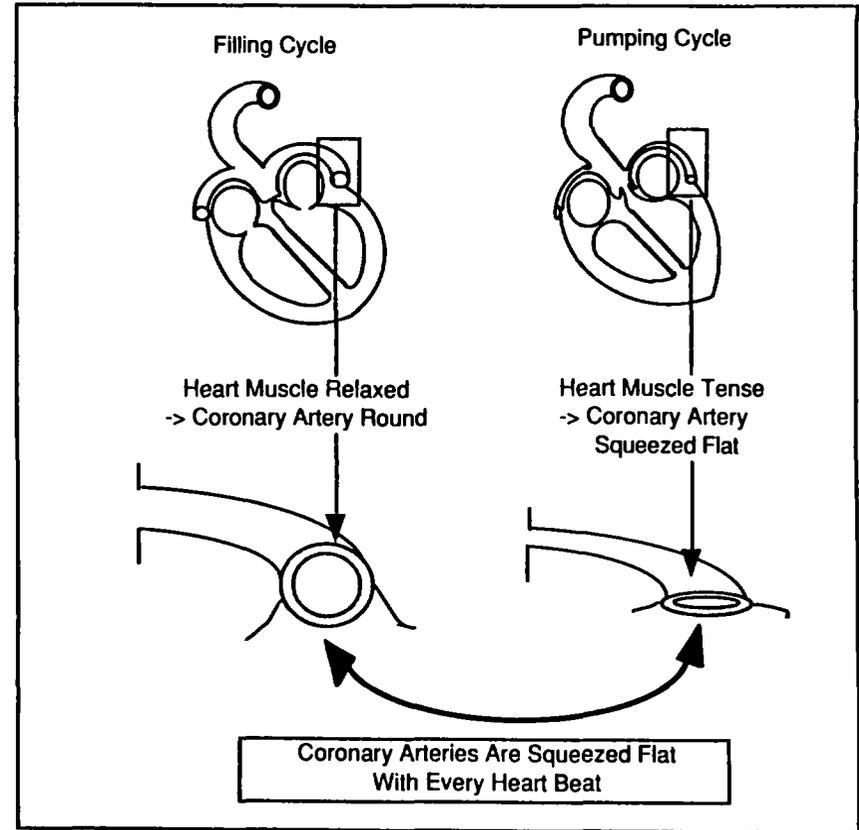
You can become an advocate for an effective, safe, and affordable health care for yourself and also for the benefit of your loved ones. This book gives you important arguments based on the latest scientific discoveries and clinical studies. Talk about this book within your community, to your local newspaper. Ask them to report about these important discoveries. Contact your political representatives. You can make the difference.

## HOW THE HEART IS NOURISHED



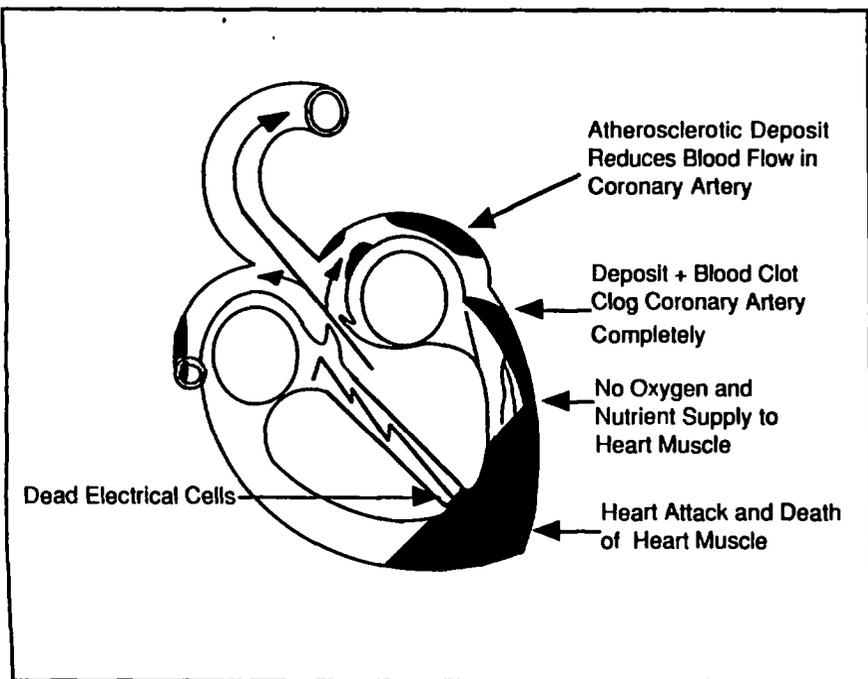
Since the heart is the pumping station for the blood, one could assume the heart muscle gets its oxygen and nutrition from the blood inside the pump, but this is not the case. The main blood supply for oxygen and nutrients to millions of heart muscle cells comes from outside - through the coronary arteries. The coronary arteries received their name from the Latin word for crown (corona). In fact, the coronary arteries surround the heart like a crown and ride directly on the heart muscle. From the aorta one coronary artery branches off to the right side of the heart and one coronary artery branches off to the left side of the heart and divides into two larger branches. From these large coronary arteries smaller blood vessels branch off delivering oxygen and nutrients to millions of heart muscle cells. Optimum blood flow through the coronary arteries is essential for the proper functioning of the heart. Interruption of the blood flow through the coronary arteries leads to heart attacks.

## WHY THE CORONARY ARTERIES ARE THE MOST STRESSED ARTERIES OF THE HUMAN BODY

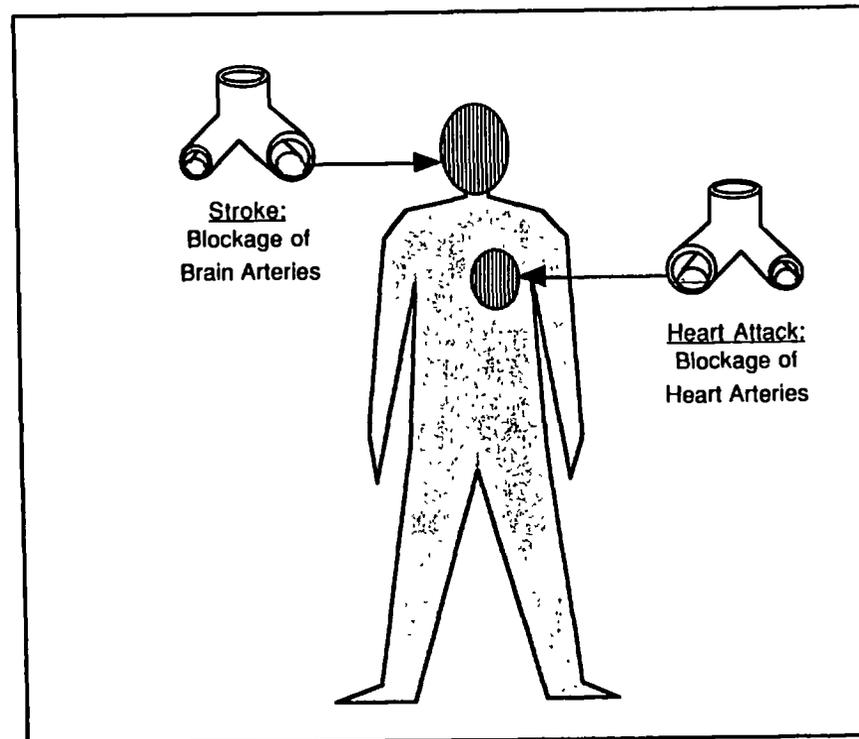


The coronary arteries undergo the greatest stress among all blood vessels in the human body. Because these blood vessels are tightened to the surface of the heart, they are forced to follow its every movement. Every heartbeat involves a contraction of the heart muscle. This rhythmic spasm of the heart squeezes flat the coronary artery running atop the heart muscle. Since the heart beats about 100,000 times per day the coronary arteries on top of the heart are squeezed flat 100,000 times every day. It is easy to understand that this squeezing mechanism exerts great mechanical stress on the wall of the coronary arteries. Just think of stepping on a garden hose and squeezing it flat 100,000 times a day. The continuous mechanical squeezing of the coronary arteries causes small lesions of the blood vessel wall. In a blood vessel wall weakened by vitamin C deficiency these lesions occur frequently and cause the development of atherosclerotic deposits and heart attacks.

## HOW A HEART ATTACK OCCURS



## HOW A STROKE OCCURS



This year more than one and a half million Americans will suffer a heart attack. Heart attacks are caused by interruption of the blood flow through the coronary arteries. The development of atherosclerotic deposits leads to narrowing of the blood vessel and to a decreased blood flow through the arteries. At this stage patients frequently experience the alarm sign of heart disease - chest pain or angina pectoris. In most cases a blood clot has formed in the neighborhood of an atherosclerotic deposit. This event leads to clogging of the coronary artery and to a complete interruption of the blood flow. As a result, millions of heart muscle cells suffocate from lack of oxygen and nutrients, and many of these cells die. In general, heart attacks lead to the irreversible damage and death of a portion of the heart muscle. The effect of a dead heart muscle portion for the functioning of the heart is comparable to the failure of one cylinder in a motor: the performance is permanently impaired.

While heart attacks are caused by clogging of the heart arteries, strokes are caused by clogging of the brain arteries. Atherosclerotic deposits frequently develop in the arteries of the neck (carotid arteries) and the brain (cerebral arteries). If the blood flow to the brain is interrupted a stroke occurs and millions of brain cells suffocate and eventually die. Since brain cells coordinate the movement of every part of our body, their death frequently leads to paralysis - the typical sign of a stroke.

Why is a stroke a frequent form of cardiovascular disease? The arteries of the brain are located close to the pumping station, the heart. As in the technical world, the pressure in a pipeline is greatest immediately adjacent to a pumping station. The arteries of the heart and the brain have a relatively high blood pressure compared to other blood vessels of the body. This pressure stresses the walls of the blood vessels, particularly if additional blood flow turbulences exist in branching areas of the arteries. If this pressure stress meets an arterial wall weakened by vitamin deficiency, deposits develop and eventually strokes occur. Now we can also explain why patients with high blood pressure carry a particular risk for strokes.

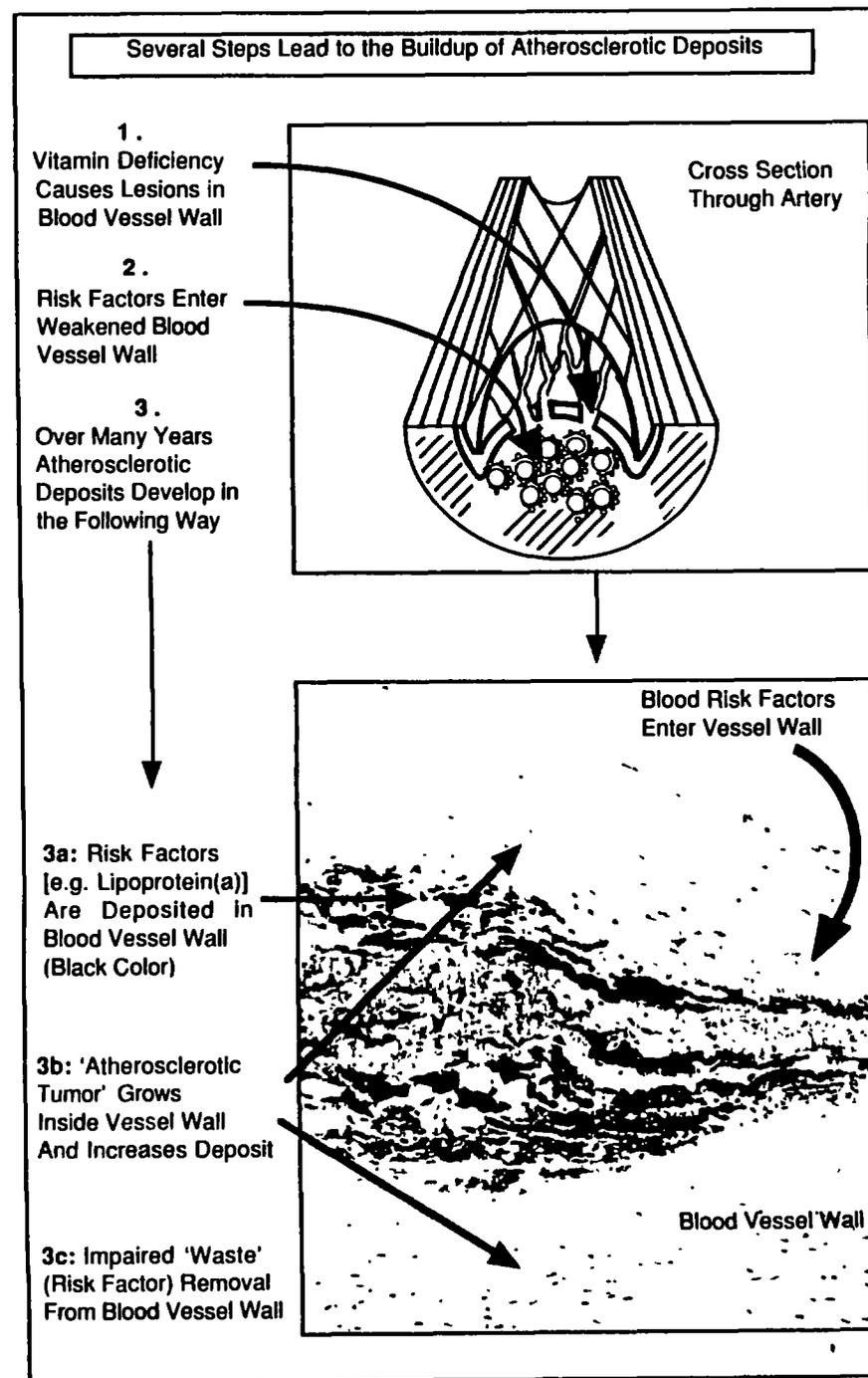
## HOW ATHEROSCLEROTIC DEPOSITS DEVELOP

Atherosclerotic deposits develop as a response to small lesions in the blood vessel wall. We already know that these lesions are caused by mechanical stress on the arteries in combination with a blood vessel wall weakened by vitamin deficiency. These small lesions occur in the barrier cells (endothelium) between the blood stream and the blood vessel walls. On the following page you will take a look inside an atherosclerotic deposit of a human artery. This picture is magnified under a microscope. Several observations can be made:

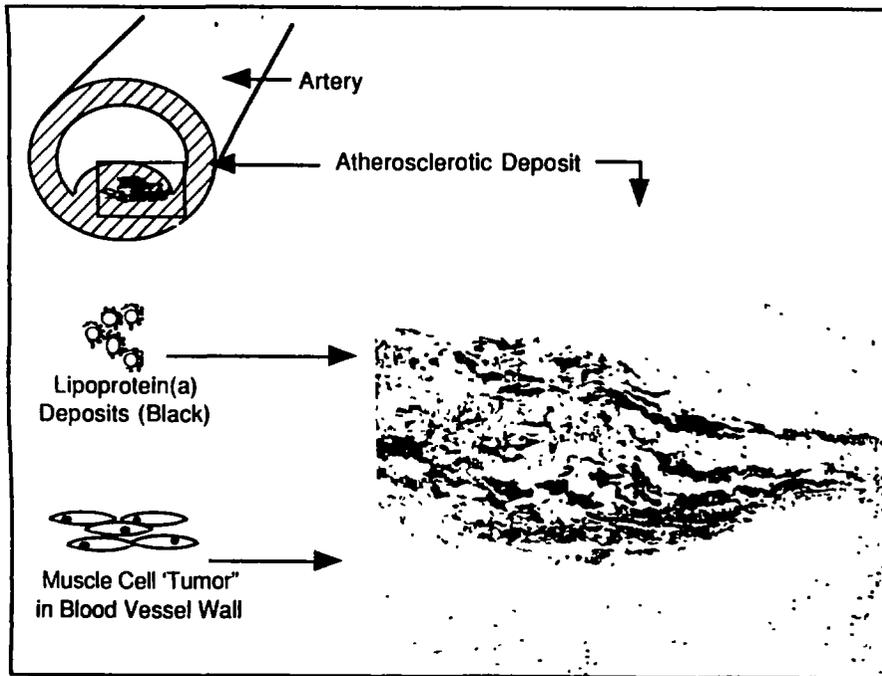
- The black area represents fat globules which have entered the vessel wall from the blood stream. Inside the blood vessel wall thousands of these fat globules are laid down and thereby contribute to the growth of atherosclerotic deposits.
- This picture also shows a second important factor contributing to the buildup of deposits - a small 'atherosclerotic tumor'. This local 'tumor' is formed inside the blood vessel wall by muscle cells which grow rapidly during cardiovascular diseases and thereby further narrow the blood flow in the arteries. The deposition of risk factors and a local tumor build up an 'atherosclerotic plaster cast' inside the vessel walls. The function of this cast is to stabilize these walls weakened by vitamin deficiency.
- A third mechanism which contributes to the development of deposits is caused by an impaired waste collection system in the vessel wall. The waste collectors are certain white blood cells which normally circulate in our blood. These waste collection cells enter the vessel wall and pick up deposited fat globules and other waste products from the vessel wall. If these waste collector cells overload themselves they become unable to move back into the blood stream and they get stuck inside the blood vessel wall. In this situation the waste collectors themselves become part of the problem: they contribute to the further build up of atherosclerotic deposits.

Of particular significance for the development of atherosclerotic deposits is the fat globule lipoprotein(a) a newly identified risk factor for cardiovascular disease. Together with my colleagues at Hamburg University, I reported the most comprehensive studies on lipoprotein(a) in human arteries yet. Several thousand data samples were collected from patients undergoing bypass surgery as well as from human arteries at autopsy. We discovered that lipoprotein(a) is the primary risk factor for the development of atherosclerotic deposits in human arteries. Let us now have a closer look at some of these mechanisms.

For More Information: Lipoprotein(a) And Atherosclerosis: Rath M 1989; Niendorf A 1990; Beisiegel U 1990; Rath M 1991a; Lawn RM 1992. Previous Atherosclerosis Concepts: Brown MS 1984, Steinberg D.1989; Ross R 1993.



## HOW LIPOPROTEIN(a) FORMS DEPOSITS IN THE BLOOD VESSEL WALL

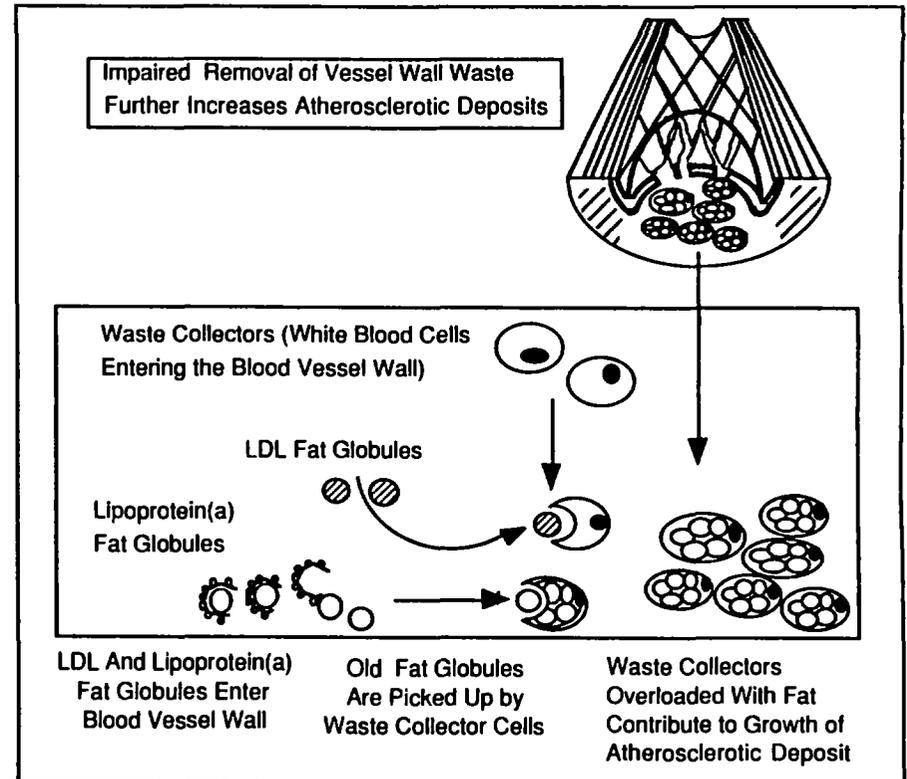


There are different ways by which the lipoprotein(a) particle contributes to the growth of atherosclerotic deposits:

- *By its own size.* Among all the particles swimming in our blood, lipoprotein(a) is one of the largest. For example, one lipoprotein(a) particle is 10,000 times bigger than hormone molecules and most other proteins in our body. Many lipoprotein(a) particles together can easily form a bulge within an atherosclerotic deposit.
- *By capturing other fat globules.* Once deposited inside the blood vessel wall, the sticky lipoprotein(a) molecule captures other fat globules from the blood, such as LDL (low-density lipoproteins), and makes them glue inside the blood vessel wall as well.
- *By stimulating the growth of cells inside the blood vessel wall.* Lipoprotein(a) also stimulates the growth of muscle cells inside the blood vessel wall. In this way lipoprotein(a) stimulates the atherosclerotic tumor to grow thereby further decreasing blood flow in the arteries of the heart or of other organs.

Further Information: Binding of Lipoproteins: Rath M 1991a, Trieu VN 1991. Cell growth: Grainger DJ 1993.

## IMPAIRED WASTE COLLECTION FROM THE BLOOD VESSEL WALL FURTHER INCREASES DEPOSITS



Fat globules (lipoproteins) which have been stuck inside the vessel wall for some time gradually age. This aging process is greatly accelerated by free radicals and the biological rusting process you have already learned about. These aged or rusted fat globules are eaten up by the waste collector cells which had entered the vessel wall from the blood stream. Of course, these waste collectors become primarily overloaded in those areas of the vessel wall where atherosclerotic deposits develop. Under the microscope these fat-loaded waste collector cells look foamy, so they have also been named foam cells. Many foam cells inside the blood vessel wall further accelerate the development of atherosclerotic deposits. Aged or biologically rusted lipoprotein(a) fat globules, LDL (low-density lipoprotein), and VLDL (very low-density lipoproteins) can all cause foam cell formation.

Let us now have a closer look at lipoprotein(a) and how this newly identified risk factor relates to already known heart risk factors such as cholesterol.

Further Information: Oxidation of LDL: Steinberg D 1989. Vitamin C as Antioxidant: Frei B 1989.

## WHAT IS LIPOPROTEIN (a)

For half a century it was thought that cholesterol entering the vessel wall from the blood was the main factor leading to the buildup of deposits. More recently, LDL cholesterol was proposed to be the villain for the development of atherosclerotic deposits. Today we know that these factors play only a secondary role. Atherosclerotic deposits are essentially the result of the newly identified risk factor lipoprotein(a). This figure explains what cholesterol, low density lipoprotein (LDL) and lipoprotein(a) have in common and what sets them apart.

**Cholesterol.** Cholesterol is a very important molecule for the growth of every cell in our bodies. Cholesterol molecules do not swim in the blood like fat in the soup. Thousands of cholesterol molecules are packed together with other fat molecules in tiny round globules called lipoproteins. Millions of these fat transporting vehicles circulate in our body at any time. The best-known among these are high density lipoproteins (HDL, or "good cholesterol") and low density lipoprotein (LDL, or "bad cholesterol").

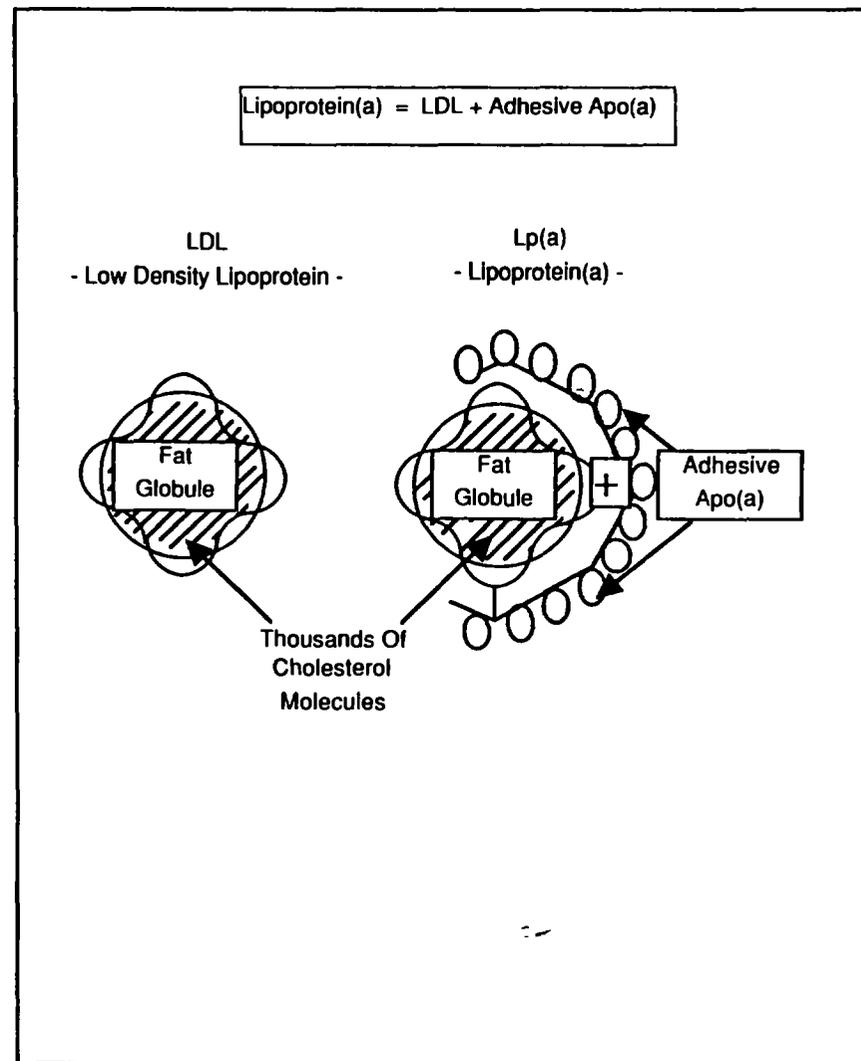
**LDL Cholesterol.** Most of the cholesterol molecules in the blood are transported in millions of LDL particles in the blood. By carrying cholesterol and other fat molecules to our body cells, LDL is a very useful transport vehicle to supply nutrients to these cells. LDL has been named the "bad cholesterol" during the years when researchers missed the real villain - the "very bad cholesterol" - which causes blood vessel deposits: lipoprotein(a).

**Lipoprotein(a).** Lipoprotein(a) is an LDL particle with an additional adhesive protein wrapped around it. This biological adhesive tape is named apoprotein(a), or apo(a). The letter (a) could in fact stand for 'adhesive'. The adhesive apo(a) makes the lipoprotein(a) fat globule one of the stickiest particles in our body. In brief:

- The adhesive apo(a) is responsible for millions of lipoprotein(a) fat globules sticking inside the walls of the blood vessels and forming atherosclerotic deposits.
- LDL has no adhesive tape and therefore is much less of a risk factor for cardiovascular disease.
- The adhesive tape is the real risk - not cholesterol or the fat globule.
- Less adhesive means less risk for heart disease.

This figure can also explain why most cardiovascular researchers have missed this important risk factor for 30 years. Lipoprotein(a) and LDL look alike, and one has to specifically look for the adhesive apo(a) to find out the scientific truth. This was achieved by our studies at Hamburg University .

Further Information: Lipoprotein(a) general aspects: Berg K 1963; Utermann G 1989; Scanu A 1991; Adhesive properties: Rath M 1991b and 1992f.



## LIPOPROTEIN(a) IS THE GREATEST RISK FACTOR FOR CARDIOVASCULAR DISEASE KNOWN TODAY

- Lipoprotein(a) is a Heart Risk Factor 10 Times Greater Than LDL, the "Bad Cholesterol"
- Lipoprotein(a) is by far the Greatest Risk Factor
  - For Heart Attacks
  - For Strokes
  - For Clogging of Bypass Blood Vessels After Coronary Bypass Surgery
  - For Clogging of Arteries After Angioplasty

Today lipoprotein(a) has been confirmed as the leading risk factor for many forms of cardiovascular diseases:

- Lipoprotein(a) is a ten times greater risk factor for heart disease than LDL cholesterol. This fact was revealed during a recent reevaluation of the Framingham Heart Study, the largest cardiovascular risk factor study ever conducted.
- Lipoprotein(a) is the greatest risk factor known today for heart attacks. This fact was established in studies of survivors with myocardial infarction, and by angiography studies in patients with coronary heart disease.
- Lipoprotein(a) is the greatest risk factor known today for atherosclerosis of the brain arteries and for strokes.
- Lipoprotein(a) is the greatest risk factor known today for the clogging of bypass blood vessels after a patient has undergone coronary bypass surgery.
- Lipoprotein(a) is the greatest risk factor known today for the restenosis (formation of new deposits or blood clots) of coronary arteries after coronary angioplasty (balloon catheterization or similar procedures which mechanically remove atherosclerotic deposits).

Further Information: Lipoprotein(a) And Coronary Heart Disease: Kostner G 1983; Dahlen GH 1986; Rhoads GG 1986; Genest J 1991. Stroke: Zenker G 1986; Mural AS 1986. Coronary Bypass: Hoff HF 1988. Angioplasty: Hearn JA 1992.

## YOU SHOULD KNOW YOUR LIPOPROTEIN(a) BLOOD LEVELS

0 - 20 mg/dl	Low Risk for Heart Disease
20 - 40 mg/dl	Medium Risk for Heart Disease
> 40 mg/dl	High Risk for Heart Disease

Lipoprotein(a) blood levels vary greatly between one individual and another. What do we know about the factors influencing the lipoprotein(a) levels in the blood:

- Lipoprotein(a) levels are largely determined by inheritance.
- Special diet does not influence lipoprotein(a) blood levels.
- None of the presently available lipid-lowering prescription drugs lowers lipoprotein(a) blood levels.
- Vitamin C and vitamin B3 can lower blood levels of lipoprotein(a) (see Section E). Together with the natural amino acids lysine and proline (see Section D) the risk from lipoprotein (a) can be significantly lowered by nutritional supplements.

Everybody should know their lipoprotein(a) blood level. The above figures give you a basic guideline to properly read the results of your lipoprotein(a) blood test and to find your personal risk. People whose lipoprotein(a) concentrations are greater than 30 mg/dl (milligrams per hundred milliliter) have a two-fold increased risk of developing cardiovascular disease. On the following page you will find a more detailed interpretation of the risk from lipoprotein(a) testing in combination with LDL testing.

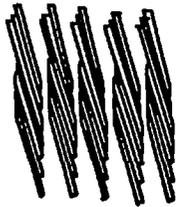
Further Information: Inherited Lipoprotein(a) Levels: Utermann G 1989; Koschinsky M 1990. Risk Factor Analysis: Armstrong VOW 1986. Vitamin Therapy: Carlson LA 1989; Rath M 1991a, 1992c and 1992e.



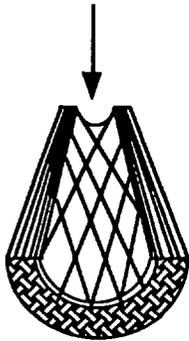
**Two Alternatives to Stabilize Your Blood Vessels**

**Alternative # 1**

Molecules  
Responsible  
for Stability



Collagen Molecules

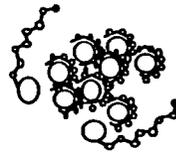


Healthy Artery Wall:  
Reinforced by Sufficient  
Collagen Molecules

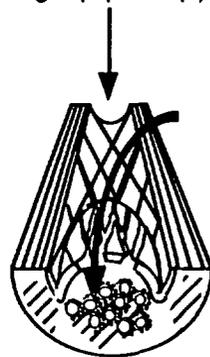
You Have  
the Choice by

Optimum Vitamin C  
Intake in Your Diet

**Alternative # 2**



Repair Molecules  
e.g. Lipoprotein(a)



Weakened Artery Wall:  
Stability Provided by  
Atherosclerotic Plaster Cast

Insufficient Vitamin C  
Intake in Your Diet

**Which Alternative Do You Prefer?**

**VITAMIN C DEFICIENCY IS THE PRIMARY CAUSE OF  
CARDIOVASCULAR DISEASE**

**- EARLY CLINICAL EVIDENCE -**

**1941:** The Canadian cardiologist J.C. Paterson reports that more than 80% of his heart disease patients have vitamin C deficiency as a significant risk factor.

**1948:** The American doctors R.W. Trimmer and C.J. Lundy report that 70% of their patients with coronary artery disease have very low vitamin C blood levels.

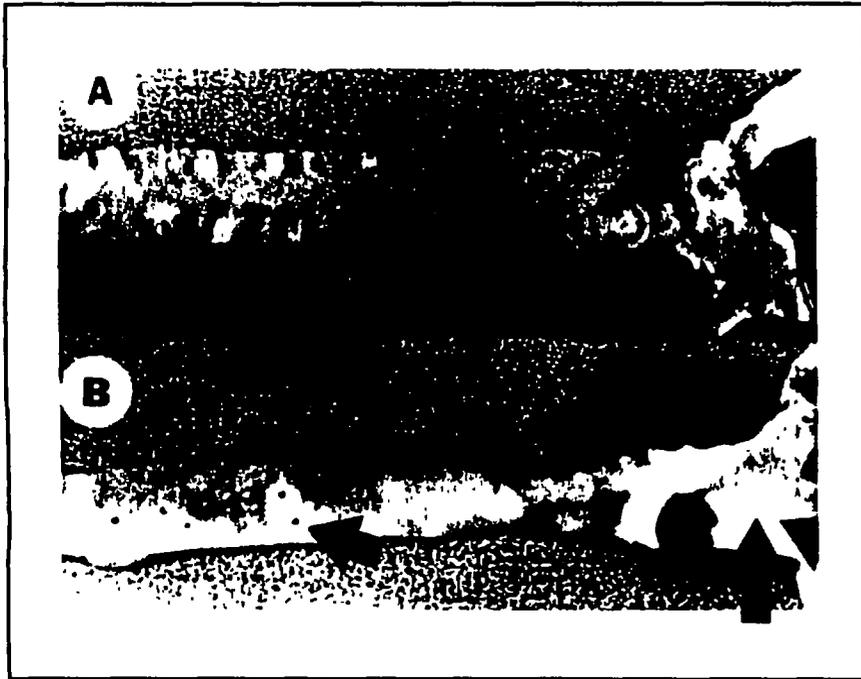
Already half a century ago first clinical reports showed that patients with cardiovascular diseases have much lower vitamin C blood levels than healthy persons. This study was published in 1941 by the Canadian cardiologist J.C. Patterson. He found that more than 80% - or four out of five - of his patients with heart disease suffered from vitamin C deficiency.

In 1948, the American doctors R.W. Trimmer and C.J. Lundy found similar results in their coronary heart disease patients. In the medical journal *American Practitioner* they reported the measurements of vitamin C blood levels in 556 patients with various diseases. Two out of three patients with coronary heart disease were found to have very low vitamin C blood levels. Moreover, among all diseases investigated vitamin deficiencies were widest spread among heart disease patients.

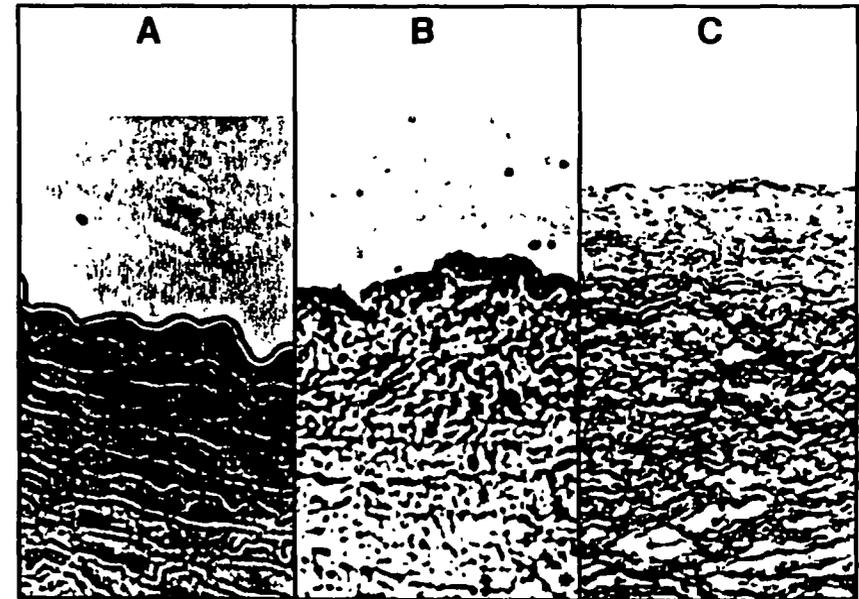
Thus, a low vitamin C intake and low vitamin C blood levels were found to be leading risk factor for cardiovascular diseases long ago.

Measurements of vitamin C concentration in the blood vessel wall showed similar results.

Further Information: Paterson JC 1941; Trimmer RW 1948; Knox EG 1973.



VITAMIN C DEFICIENCY IS THE PRIMARY CAUSE OF  
CARDIOVASCULAR DISEASE  
- THE PROOF -

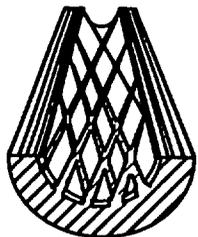


Let us now have a closer look inside vessel walls with sufficient and insufficient vitamin C content. The above pictures A and B show a cut through the blood vessel wall of guinea pigs magnified under a microscope. For comparison, picture C gives you a look inside a human blood vessel. We can make the following observations:

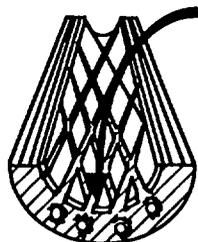
- *Picture A* shows the blood vessel wall from a guinea pig on a *high* vitamin C diet: Two features are important to note. First, the barrier (fine white line) between the blood stream and blood vessel wall is intact. Thus, few risk factors can enter the blood vessel wall from the blood stream. Second, the blood vessel wall itself shows a regular structure of collagen molecules inside the blood vessel wall. This regular structure guarantees optimum stability and elasticity of these blood vessel walls.
- *Picture B* shows the blood vessel wall from a guinea pig on a *low* vitamin C diet: Again two features are noteworthy: First, the barrier between the blood stream and blood vessel wall is disrupted and broken. It is evident that this blood vessel wall is open for many risk factors entering from the blood stream. Second, the vitamin C deficient blood vessel wall shows a very disorganized collagen pattern. These collagen molecules are unable to provide stability and elasticity to the wall. These weak vessel walls develop atherosclerotic deposits as a 'cast' to improve stability.
- *Figure C* shows a similar slice through an atherosclerotic human artery. Again, disrupted collagen molecules are the basis for the development of atherosclerotic deposits. Please compare picture C with pictures A and B.

Our new understanding of cardiovascular disease is summarized on the next page.

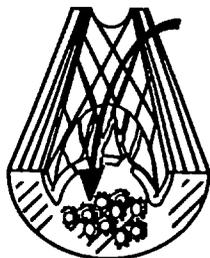
### The Principles of Cardiovascular Disease



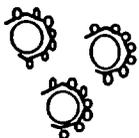
• The primary cause of cardiovascular disease is vitamin C deficiency leading to weakness of the blood vessel walls.



• Cardiovascular disease begins with the deposition of repair molecules inside the blood vessel wall.



• If vitamin deficiency continues over many years these repair molecules become risk factors, the vessel wall repair mechanism overshoots, and cardiovascular disease develops.



• Lipoprotein(a) is the most effective vessel wall repair molecule and therefore - over time - becomes the greatest risk factor for cardiovascular disease.

## HEART ATTACKS, STROKES, AND PERIPHERAL VASCULAR DISEASES

### Why Some Forms of Cardiovascular Diseases Are More Frequent Than Others

	Heart Attacks (7 Million)	Strokes (3 Million)	Peripheral Vascular Disease (1 Million)
Weak Blood Vessel Wall (Vitamin C Deficiency)	# 1	# 1	# 1
Higher Blood Pressure in Arteries Close to Heart	# 2	# 2	No
Mechanical Stress on Blood Vessel Wall	# 3	No	No
High Levels of Blood Risk Factors	Optional	Optional	# 2

We can now explain why heart attacks are more frequent than strokes and strokes more frequent than the clogging of arteries in the body's periphery:

- Seven million Americans are diagnosed with diseases of the heart arteries.
- Three million Americans are diagnosed with diseases of the brain arteries.
- An estimated one million Americans are diagnosed with cardiovascular diseases in other organs and the extremities of the body (periphery).

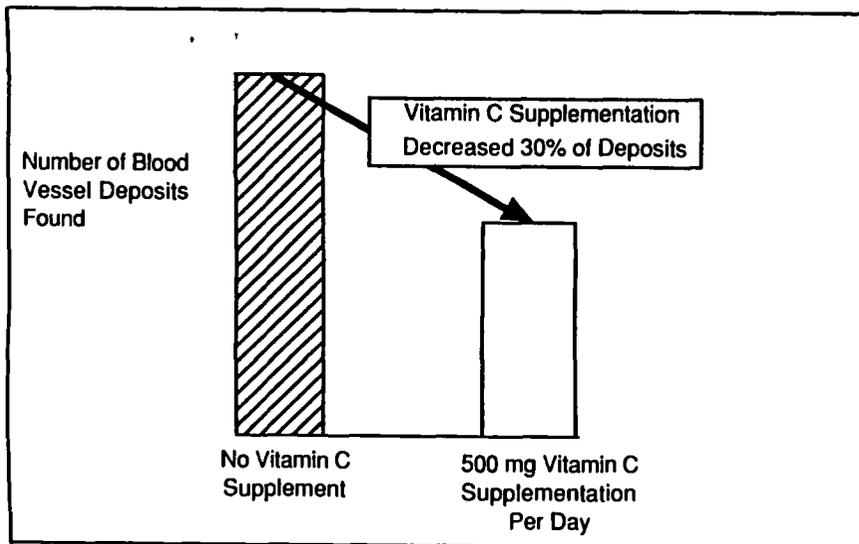
The answer for this phenomenon is summarized in the above figure:

- The underlying cause of all forms of cardiovascular diseases is a weakness of the blood vessels as a result of vitamin deficiencies (#1).
- The more *additional local* factors challenge this instable blood vessel wall the more often the vascular system fails at this specific location.
- One additional local challenge is the higher blood pressure in the arteries of the heart and the brain explaining heart attacks and strokes (#2).
- The greatest local challenge is the mechanical stress for the coronary arteries explaining heart attack as the leading cardiovascular disease (#3).
- High levels of blood risk factors alone cannot explain the local failure of the cardiovascular system in form of heart attacks or strokes. But if these risk factors are present *in addition*, heart attacks and strokes occur earlier.
- In contrast, peripheral vascular diseases are caused by a direct damage of certain blood risk factors to the wall of the entire blood vessel pipeline. Vascular diseases in smokers and diabetics are examples (Section E).

**NOTES****SECTION D****HOW TO REVERSE EXISTING  
CARDIOVASCULAR DISEASE  
WITH  
NUTRITIONAL SUPPLEMENTS**

- **Reduce Existing  
Atherosclerotic Deposits**
- **Improve the Blood Supply to a  
Suffocating Heart**
- **Reduce Angina Pectoris Pain**

## DIETARY VITAMIN C SUPPLEMENTATION REVERSES ATHEROSCLEROTIC DEPOSITS



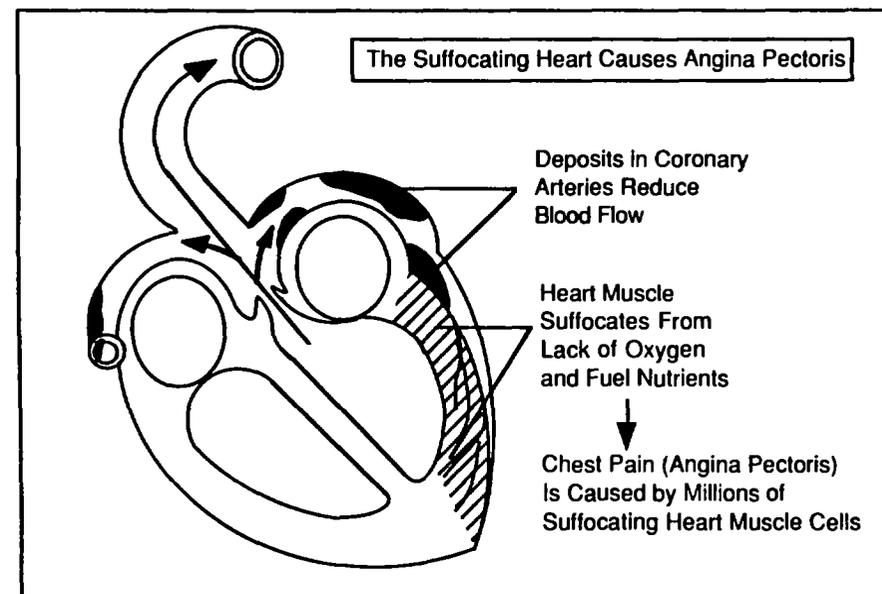
After all what you already know about vitamin C it should come as no surprise that this vitamin was also shown to reverse existing atherosclerotic deposits. In 1954 the Canadian cardiologist C. G. Willis published a landmark clinical study in which he had analyzed the size of the deposits in the leg arteries of his patients by angiography. This method uses a radioactive dye injected into the blood vessel system of the patients to measure the size of the deposits in the blood vessel walls. Today, angiography has become the standard method for evaluating coronary artery disease and other forms of cardiovascular disease.

After having measured the initial size of the deposits, Dr. Willis gave ten of his patients a daily vitamin C supplementation of 500 mg. After a period of two to six months, the patients returned to his clinic and received a control angiography. The size of the atherosclerotic deposits could then be compared with their size before vitamin C supplements were taken. In those patients taking 500 mg per day, 30% of the atherosclerotic deposits were found to be decreased. In a control group of patients who did not receive any vitamin C supplementation, none of the deposits had decreased. This is the first clinical report that vitamins can reverse existing cardiovascular disease. Unfortunately, this important study was not followed up until today.

What are the signals for a patient who has developed coronary heart disease?

Further Information: Willis GC 1954.

## DEPOSITS IN CORONARY ARTERIES LEAD TO A SUFFOCATING HEART MUSCLE AND TO ANGINA PECTORIS



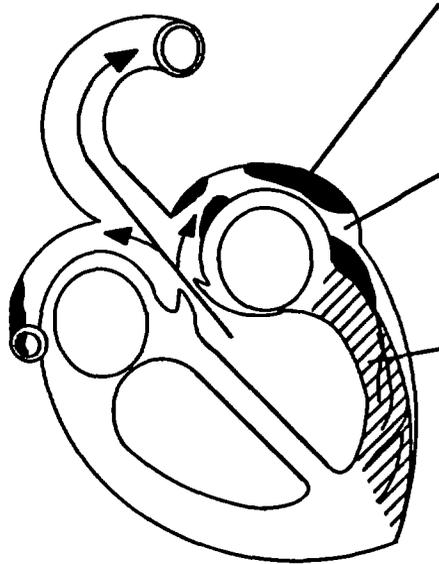
The typical alarm signal for a patient who has developed coronary heart disease is angina pectoris. Angina pectoris is a sharp pain typically occurring in the middle of the chest and spreading into the left arm. Since there are many 'untypical' forms of angina pectoris it is always best to consult your doctor about any form of chest pain.

What causes angina pectoris? Angina pectoris is caused by heart muscle cells suffocating from lack of oxygen and nutrition. Growing atherosclerotic deposits in the coronary arteries gradually decrease the blood flow to the heart muscle cells. When the blood flow in a coronary artery is reduced to about 25% of normal, the heart cells receiving their blood supplies from this artery begin to suffocate from lack of oxygen and nutrition. The pain from millions of suffocating heart cells is projected to the chest. This is what you experience as angina pectoris.

Typically, angina pectoris occurs with increased physical activity such as climbing stairs, and exercising. In this condition the heart muscle cells have to work at maximum effort, and they need a maximum supply of oxygen and nutrients. In patients with coronary artery disease, the reduced blood flow cannot meet the increased demand of the heart muscle cells and angina pectoris occurs.

## REVERSING HEART DISEASE AND DECREASING ANGINA PECTORIS

### Three Ways to Reverse Heart Disease and to Reduce Angina Pectoris



#### # One: Decreasing Deposits in Coronary Arteries

- Vitamin C
- Vitamin E
- L-Proline
- L- Lysine

#### # Two: Widening of Coronary Arteries

- Vitamin C
- Magnesium

#### # Three: Improving Metabolism of Heart Muscle Cells

- Carnitine
- Coenzyme Q10
- Pantethine
- Other B-Vitamins
- Magnesium
- Other Minerals

Angina pectoris is the typical signal for existing heart disease. Reversing heart disease therefore leads to a decrease or to a complete cessation of angina pectoris pain. In the past coronary bypass surgery or angioplasty (e.g. balloon catheterization) of the coronary arteries were the only ways to achieve this aim. Now a non-surgical way is available: The reversal of existing heart disease with selected nutritional supplements. These essential nutrients can help to improve the blood supply to the heart muscle cells by:

- *Number one:* Improving the coronary blood flow by reversing the deposits in the arteries. The most important nutritional supplements contributing to this goal are vitamin C, vitamin E, L-proline, L-lysine, and antioxidant vitamins.
- *Number two:* Increasing the blood flow in the coronary arteries by widening the coronary arteries. The key essential nutrients for this are vitamin C and magnesium.
- *Number three:* Improving the level of fuel nutrients for suffocating heart muscle cells. This aim can be achieved by supplementing your diet with the following essential nutrients: carnitine, coenzyme Q10, pantethine and other B vitamins, magnesium, as well as other minerals and trace elements.

By following these recommendations, angina pectoris will decrease in most cases within weeks. The following page lists the essential nutrients which can help you reverse existing heart diseases in your body.

## NUTRITIONAL RECOMMENDATIONS TO REVERSE HEART DISEASE

Below are my recommendations to help you to reverse existing heart diseases and to achieve optimum cardiovascular health.

These recommendations are based on recent scientific discoveries and the most important effects of the ingredients are given in parentheses. These recommendations are already being followed by several thousands people in the United States and in other countries.

On the following pages I shall share with you the letters from some of the patients following my recommendations.

<b>Vitamin C</b>	(Restoring Blood Vessel Stability, Deposit Removal, Antioxidant, Others)
<b>Vitamin E</b>	(Antioxidant, Deposit Removal)
<b>Beta Carotene</b>	(Antioxidant)
<b>L-Proline</b>	(Blood Vessel Teflon, Atherosclerotic Deposit Removal)
<b>L-Lysine</b>	(Blood Vessel Teflon, Atherosclerotic Deposit Removal, Cell Fuel)
<b>L-Carnitine</b>	(Cholesterol Decrease, Triglyceride Decrease, Cell Fuel)
<b>Coenzyme Q10</b>	(Cell Fuel)
<b>Vitamin B-1</b>	(Cell Fuel)
<b>Vitamin B-2</b>	(Cell Fuel)
<b>Vitamin B-3 (Niacin)</b>	(Cholesterol Decrease, Triglyceride Decrease, Cell Fuel)
<b>Vitamin B-3 (Niacinamide)</b>	(Cell Fuel)
<b>Vitamin B-6</b>	(Cell Fuel)
<b>Vitamin B-12</b>	(Blood Cell Factor, Cell Fuel)
<b>Folic Acid</b>	(Blood Cell Factor, Cell Fuel)
<b>Vitamin D</b>	(Cell Fuel)
<b>Biotin</b>	(Cell Fuel)
<b>Pantothenate</b>	(Cholesterol Decrease, Triglyceride Decrease, Cell Fuel)
<b>Calcium, Magnesium, Zinc, Manganese, Copper, Selenium, Chromium, Molybdenum</b>	(Minerals And Trace Elements Are Required For Many Cell Functions).

You will find detailed information about these recommendations at the end of this book.

**REVERSING HEART DISEASE AND  
ALLEVIATING SUFFOCATING HEART WITHIN WEEKS  
- THE PROOF -**

**TESTIMONIALS FROM PATIENTS WITH  
ANGINA PECTORIS WHO ARE FOLLOWING  
MY CARDIOVASCULAR HEALTH  
RECOMMENDATIONS**

Dear Dr. Rath:

In May, 1992 some extraordinary physical exertion on my part (heavy lifting) brought on pain that was especially noticeable in my left arm and left shoulder. I thought that I had badly strained these muscles in my upper body. There was so much discomfort that I was not able to sleep until the morning hours. By the next morning the pain had progressed to the middle of my chest and I then recognized the pain as angina.

Immediately, I started a series of treatments. During the treatments and after, I started a walking program. Although my walking did not cause any severe angina pain, there was still a tightness in my chest and a necessity to slow down my pace because of a shortness of breath.

It wasn't until I started following your cardiovascular health recommendations that I experienced a difference. Remarkably, within a month the discomfort from walking had entirely disappeared.

Presently, I am walking 2.5 miles at least 3 days per week at a very fast clip with no discomfort whatsoever. I am cognizant that the buildup within my blood vessel walls occurred over a long time period, so I am prepared to continue following your recommendations on a continuous basis. It's a small price to pay for arteries that are free of atherosclerotic deposits.

Thanks for your cardiovascular recommendations! I feel that you have made a tremendous scientific breakthrough in the treatment of heart disease.

I look forward to your upcoming book.

M.L., USA

Dear Dr. Rath:

I had been having chest pain (angina pectoris) for several years on the average of about every three weeks. Since I started follow your cardiovascular health recommendations over 90 days ago, I have only had chest pain one time, which was about three weeks after receiving my first bottle.

I am following your cardiovascular health recommendations because I feel that proper nutrition can prevent eighty percent of our health problems.

E.T., USA

From a patient's letter to his doctor:

I can't wait to see you in six weeks. Since following Dr. Rath's cardiovascular health recommendations I have had no angina. This past May I walked and climbed the rugged ocean trails of the rain forest without so much as a twinge. And recently, I have walked the last 2-18 holes of golf - something unheard of since my heart attack.

In closing, I and my family are very pleased and would like to thank you.

J.T., Canada

Dear Dr. Rath:

I am happy to write to you telling you of the benefits that I have received since starting to follow your recommendations for cardiovascular health. It has been approximately one month since I began and I have been able to notice a remarkable improvement in my energy and vitality. Several of my neighbors have commented that I look better than I have for years.

It was a little over three years ago that I suffered a brain-stem stroke which has left me with a little disability in my walking and some weakness. However, since that time I have had surgery for a narrowing of the arteries (endarterectomy). Recovery from that surgery was uneventful. Then in 1992 I developed a blood disorder with low platelets (down to 3,000). Treatment has been extensive including chemotherapy, blood infusions, and even a splenectomy. A complication to all of this was blood clots in both legs. It appears that all is beginning to turn around and a lab report just today showed that my platelets have gone up to 38,000. I believe that your recommendations are having a marked effect on my getting better.

G.S., USA

Dear Dr. Rath:

I have asthma, controlled high blood pressure and angina. After following your recommendations for cardiovascular health I feel wonderful - I feel like I have more energy and can do my work easier - no chest pain, coughing or leg pains - my whole body feels light, as if I lost weight. It is a very good feeling.

Thank you for helping us in our older years.

Sincerely,

B. , Canada

Dear Dr. Rath:

I am 60 years old, my weight and general health are normal.

In January of this year I began experiencing chest pains when exercising. In April, my doctor told me, on the basis of an ECG, that I had suffered a heart attack. He continued prescribing a beta blocker which I had been taking for high blood pressure for many years.

In May I started following your recommendations for cardiovascular health and also went on a very strict vegetarian, no fat diet. My chest pain during exercise began to lessen after just two weeks of this regimen. I have now been on my diet and followed your recommendations for 2 months, and I now have no chest pain or breathlessness at all, even cycling or walking energetically for several hours at a time. I also feel better than I have felt for years, with lots of energy and high spirits. My confidence level in my heart condition is so good that I no longer carry nitro pills with me when setting out on a bicycle ride or a walk. I feel young and bright, and I look great. ( People I run into say how good I look).

Since the only changes in my lifestyle have been your cardiovascular recommendations and diet, I have to say that one or both of these factors have caused this dramatic change in my health. For what it is worth, I tend to think that the combination of both these factors together is what has caused my health to improve.

Yours truly,

K.P., Canada

Further testimonials are documented throughout this book.

## HOW NUTRITIONAL SUPPLEMENTS REVERSE EXISTING ATHEROSCLEROTIC DEPOSITS

There is no better proof for a new therapy than the personal testimony of those following this therapy. On the previous pages I shared with you how much everybody - even patients with severe heart conditions - can benefit from following the recommendations of this book. However, I still owe you a more detailed explanation how this is possible. How can nutritional supplements achieve these remarkable health improvements? You already know that several factors contribute to an improved blood supply to the suffocating heart and to the reversal of heart disease: A decrease of atherosclerotic deposits in the coronary arteries, a relaxation of the coronary artery, and an improved metabolism of the heart muscle cells.

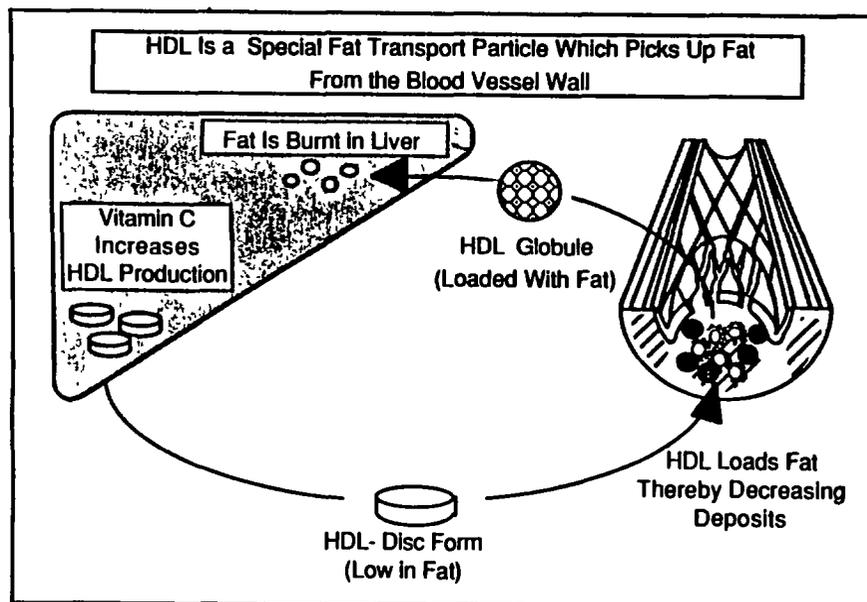
Of particular importance is the reversal of existing atherosclerotic deposits in the wall of the coronary arteries. A decrease of the deposit size results in an improved blood supply to the heart muscle - a result which was previously only achieved by surgical procedures. Because of the importance for patients and doctors I will focus here on the role of nutritional supplements in the reversal of atherosclerotic deposits.

There are several ways by which nutritional supplements can reverse atherosclerotic deposits.

- By increasing the blood levels of HDL (high-density lipoprotein) particles. These transport particles are also called "good cholesterol" because they are able to pick up fat from the deposits in the blood vessel wall and thereby decrease the fat content of the vessel wall. Vitamin C, but also vitamin E, are powerful agents increasing HDL blood levels, particularly in those patients with low levels of this useful particle. Thus, vitamin C and vitamin E help reverse existing heart diseases by improving the waste removal from the vessel wall.
- A new therapeutic approach is the use of L-lysine and L-proline. These natural amino acids provide a teflon layer which detaches lipoprotein(a) and other risk factors from their deposits inside the blood vessel wall. By releasing thousands of lipoprotein(a) particles from the blood vessel wall lysine and proline help reverse existing cardiovascular disease.
- Vitamin E has already been shown to inhibit the muscle cells in the vessel wall responsible for 'atherosclerotic tumor' growth. Vitamin C and the natural amino acids L-proline and L-lysine promise to be also effective agents to stop and reverse atherosclerotic tumors, thereby improving blood flow in the arteries.

On the following pages we will take a closer look at these different mechanisms.

## VITAMINS REVERSE ATHEROSCLEROTIC DEPOSITS BY INCREASING HDL LEVELS



Vitamin C increases the production of high density lipoprotein particles (HDL, "good cholesterol") in the liver. As a result the blood levels of HDL rise with vitamin C supplementation. HDL is a unique fat transport vehicle. Produced by the liver, the HDL particles circulate in the blood. Eventually, they enter the blood vessel walls, suck up fat molecules deposited there, and transport them back to the liver where the fat is burnt. The greater the number of HDL particles produced, the more HDL which can remove deposited fat from the blood vessel wall, and the greater the chance to reverse atherosclerotic deposits.

Like vitamin C, vitamin E is also known to increase HDL blood levels. Thus, dietary supplementation of vitamin C and vitamin E helps to reverse heart disease by increasing HDL levels. On the following pages I will introduce you to new therapeutic approaches which further accelerate the reversal of atherosclerotic deposits.

Further Information: Metabolic Transport of HDL: Breslow JL. Vitamin C And HDL: Bates JL 1977; Jacques PF 1987. HDL And Vitamin E: Hermann WJ 1979.

## A TEFLON-LIKE PROTECTION LAYER FOR YOUR BLOOD VESSEL WALLS

The risk for cardiovascular disease from lipoprotein(a) can be further reduced by preventing the deposition of lipoprotein(a), via the adhesive apo(a), inside the blood vessel wall. As we already know, the binding of lipoprotein(a) particles inside the blood vessel wall leads to development of atherosclerotic deposits. Less adhesiveness must therefore lead to less deposition of lipoproteins(a) particles. Two natural anti-adhesives have been identified:

- The amino acid L- lysine
- The amino acid L- proline

These amino acids act like a teflon layer around the lipoprotein(a) particle and inside the blood vessel wall. Natural anti-adhesives are an important new way to reduce the risk for cardiovascular disease. Dietary supplementation of lysine and L-proline has the following therapeutic effects in your body:

- Preventing further deposition of lipoprotein(a) fat globules inside your blood vessel walls.
- Releasing already deposited lipoprotein(a) from your blood vessel walls.
- Releasing also other fat globules (e.g. LDL) which had been captured inside the vessel wall via the adhesive apo(a).

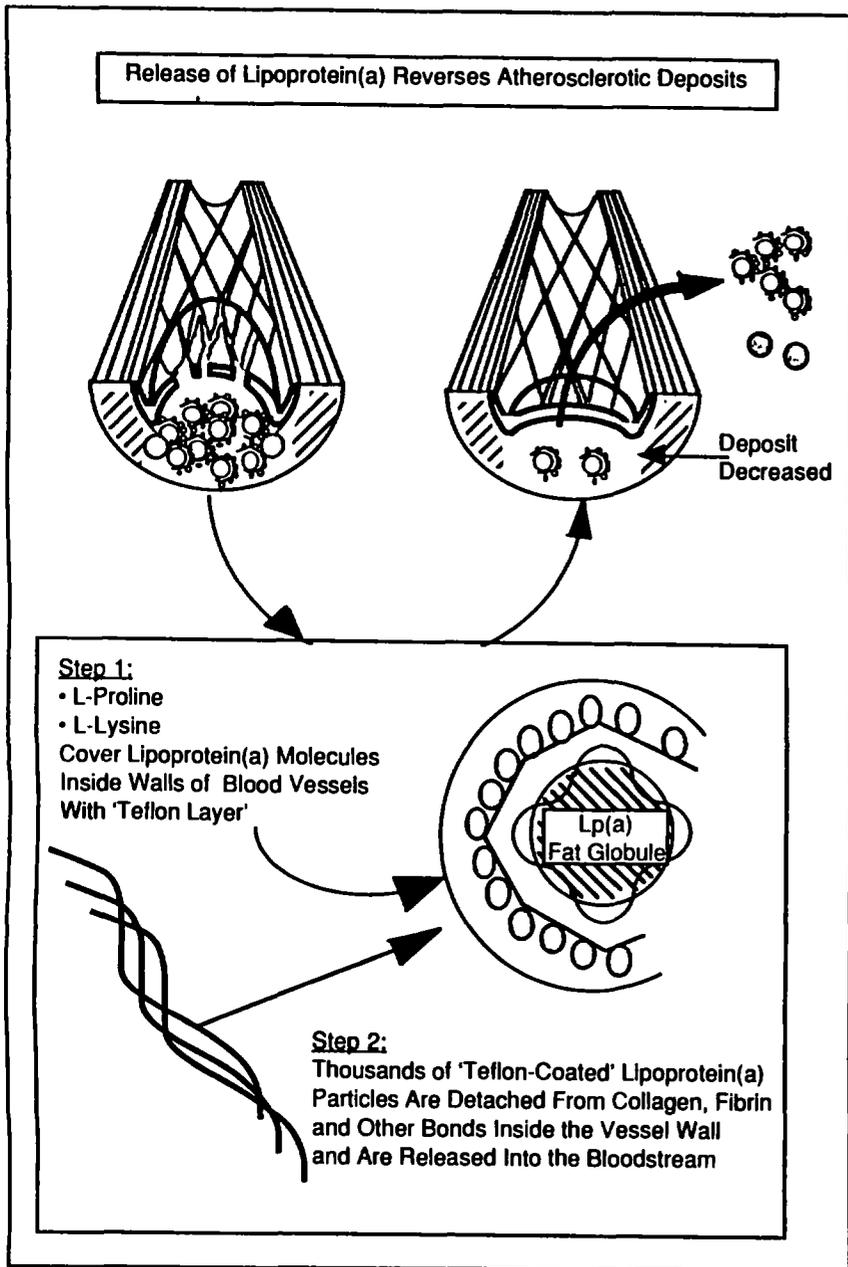
For preventive purposes I recommend a dosage of 500 mg of lysine and 500 mg of proline per day. For therapeutic purposes this dosage can be increased up to several grams per day. This dosage range is safe from any side effects.

What else should you know about these two amino acids?

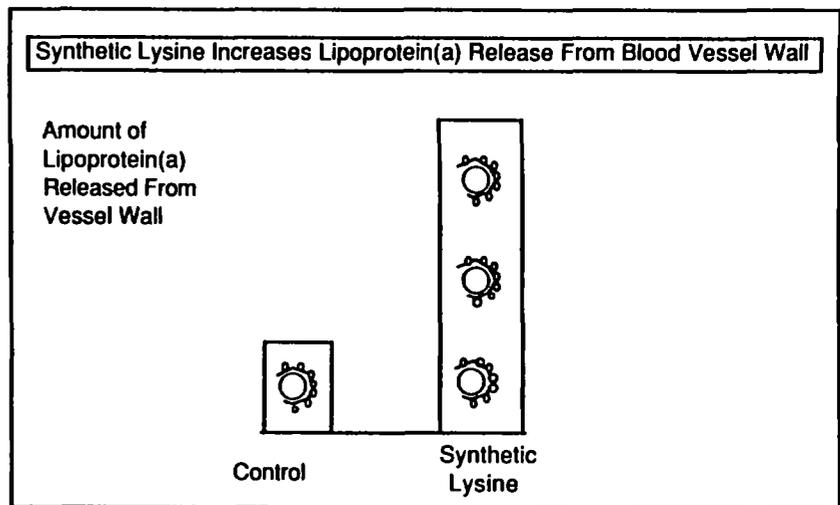
**L-lysine:** Lysine is an essential amino acid, which means that our bodies cannot manufacture lysine. We are therefore entirely dependent on an optimum intake of this amino acid in the diet. Meat is an important source for lysine. While no official recommendations have been established for this amino acid, we now understand that we frequently do not get enough of this amino acid in the diet. This is particularly true for patients at risk for cardiovascular diseases.

**L-Proline:** Proline is a non-essential amino acid, which means that our body can manufacture a certain amount of it. However, under certain conditions the amount of proline manufactured in the body may not be enough to meet the requirement. This is particularly true for patients at risk for cardiovascular diseases. It should be noted that proline is several fold more effective in neutralizing the adhesive risk from lipoprotein(a) than natural lysine.

Further Information: Therapeutic Recommendation of Lysine: Rath M 1991a. Lp(a) And Proline Trieu VN 1991. Therapeutic Recommendation of Proline: Rath M 1992e. Proline Metabolism: Phang JM.



## A MEDICAL BREAKTHROUGH FROM THE LABORATORY BENCH



How was the therapeutic value of lysine discovered? As with most discoveries in medicine it started at the laboratory bench. While working on the lipoprotein(a) research project at Hamburg University I used lysine to isolate lipoprotein(a) from the blood. The finding that lipoprotein(a) was deposited inside the blood vessel wall as an entire particle bound via the adhesive apo(a) suggested the therapeutic use of lysine as a possible anti-adhesive. The natural amino acid had the advantage of having no side effects and being immediately available as a nutritional supplement.

The above figure shows a subsequent experiment in which synthetic lysine was tested for its ability to release lipoprotein(a). These experiments confirmed that synthetic lysine was in fact able to release lipoprotein(a) from atherosclerotic deposits. Later I proposed the therapeutic use of lysine in the treatment of cardiovascular diseases.

In the same year Dr. Trieu and his colleagues published their experiments showing that the amino acid proline was another substance which can reduce the stickiness of lipoprotein(a) and the therapeutic benefits of the combined use of lysine and proline became evident.

The cardiovascular recommendations of this book are based on these recent scientific discoveries in cardiovascular and nutritional medicine. The remarkable health improvements achieved with these recommendations are no coincidence. They are based on an improved understanding of cardiovascular diseases and on the new therapeutic approaches resulting therefrom.

## THE COMING SCIENTIFIC BREAKTHROUGH : VITAMIN E, VITAMIN C, LYSINE AND PROLINE, COULD REVERSE "ATHEROSCLEROTIC TUMORS"

This and the following page will give you a glimpse into current scientific research documenting the benefits of nutritional supplements in reversing cardiovascular diseases.

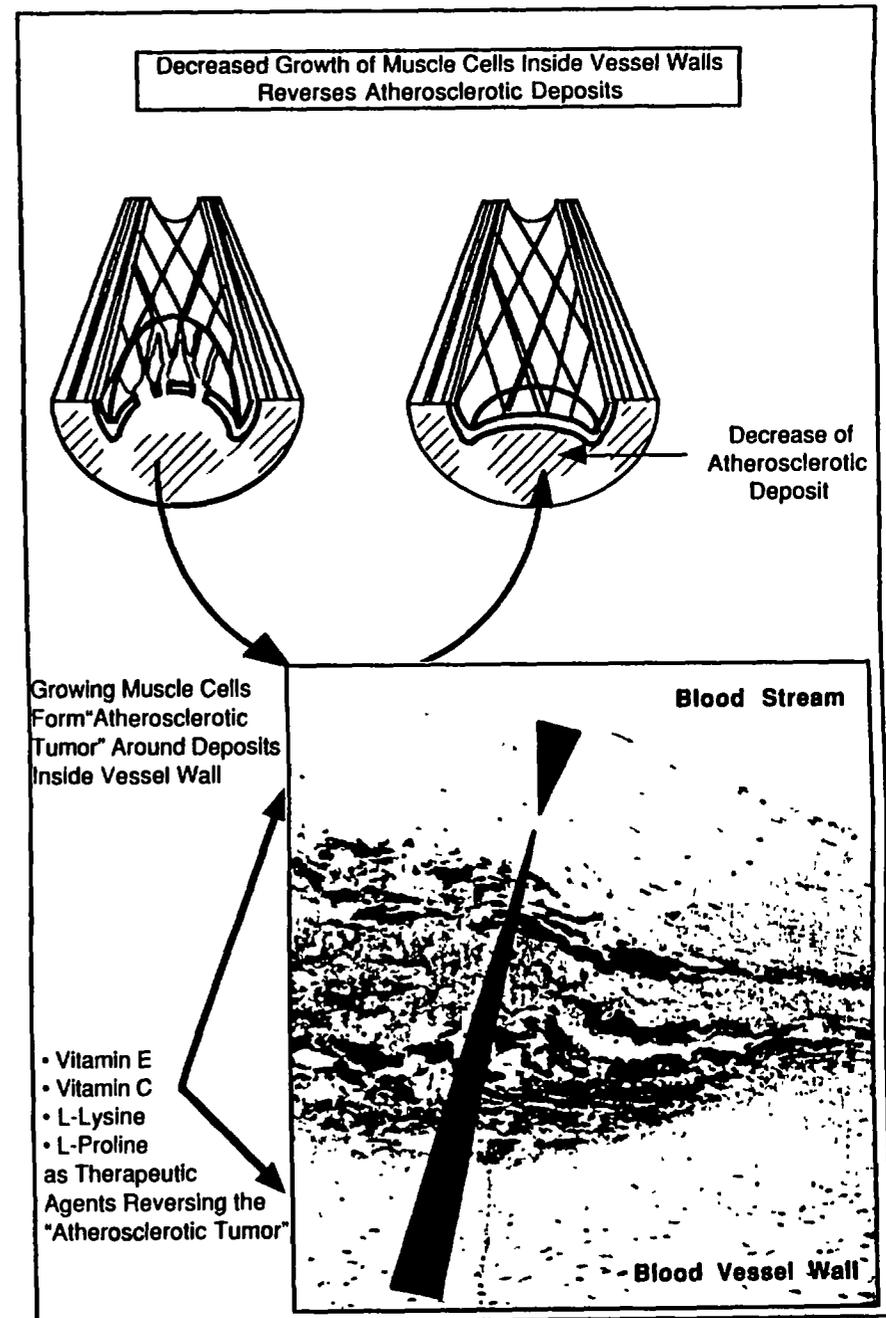
We have seen earlier that an important part of the atherosclerotic deposit is contributed by an 'atherosclerotic tumor' growing around the deposits inside the vessel wall. We also know that this local 'tumor' is caused by muscle cells inside the vessel wall which multiply uncontrolled in the neighborhood of deposits. Halting or reversing this vessel wall 'tumor' will help reverse cardiovascular diseases and improve blood flow in the arteries. Towards this end, any substance which inhibits the growth of the muscle cells in the vessel wall is of great therapeutic value. It should come as no surprise that vitamins and other essential nutrients are prime candidates to accomplish this therapeutic goal.

Vitamin E (alpha-tocopherol) has already been shown experimentally to inhibit muscle cell growth by 50%. This powerful effect can be achieved in dosages which are comparable to the blood levels of vitamin E in a person taking dietary supplements of this vitamin. It is likely that vitamin C will be found to have a similar effect.

Moreover, the amino acids lysine and proline could further decrease the size of the atherosclerotic tumor. Recently, Dr. Grainger and his colleagues at Stanford University published a report that lipoprotein(a) actively promotes the growth of these muscle cells thereby accelerating the growth of 'atherosclerotic tumors'. The pathway described by these researchers can be inhibited by lysine and proline. Thus at least four nutritional supplements are likely to inhibit and reverse the 'atherosclerotic tumors' in the vessel wall and thereby reverse existing cardiovascular diseases.

I am aware that these pages are of rather technical nature. On the other hand I wanted to share with you the fascination of medical science - the steps from an idea in the laboratory, to its verification by experiments and, finally, to its successful clinical introduction to improve the health of millions of people. What is most fascinating about research with nutritional supplements is that they are safe and affordable. In other words, you can immediately start to take advantage of the medical discoveries I am sharing with you on these pages.

Further Information: Vitamin E and Muscle Cells: Boscobolnik D 1991.  
Lipoprotein(a) and Muscle Cells: Grainger DJ 1993.



## REVERSING CARDIOVASCULAR DISEASES WITH NUTRITIONAL SUPPLEMENTS

Reversing existing atherosclerotic deposits without surgery has been one of the greatest challenges in medicine. In this section I have summarized for you the evidence that nutritional supplements can reverse atherosclerotic deposits, can effectively improve the blood supply to the suffocating heart and can free the patient from angina pectoris.

I have shared with you my recommendations for achieving this goal by utilizing a comprehensive, scientifically based, program of essential nutrients. Most importantly, I have shared with you the already available proof: Testimonials from grateful patients who are following my nutritional recommendations.

All these patients were on regular medication for treatment of their heart conditions. However, they found ultimate relief only when their bodies and their cardiovascular systems were resupplemented with vitamins and other essential nutrients. Their health improvements can be summarized as follows:

- Free of angina pectoris within only weeks
- Free of shortness of breath
- Free of irregular heartbeats
- More physical and mental energy

I am not aware of any other drug or any other treatment which is able to accomplish such remarkable health improvements within such a short time.

Moreover, an additional report is available on the lysine and vitamin C component of my recommendations. Based on my early discoveries, my former colleague Linus Pauling reported the decrease of angina pectoris after five months in a patient taking high amounts of lysine and vitamin C. While this result is encouraging it also shows the limitations of a therapeutic approach based on two components: Much higher amounts of supplements and a longer time are needed to help the patient.

In summary, the recommendations of this book are the most effective treatment presently available to prevent and treat cardiovascular diseases. Since this treatment is based exclusively on natural ingredients everyone can start immediately to take advantage of this medical breakthrough.

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Further Information : Pauling L 1991.

## HEART ATTACKS AND STROKES CAN BE ERADICATED

We are now able to summarize our present knowledge of the causes, the prevention, and the treatment of coronary heart disease and other forms of cardiovascular diseases as follows:

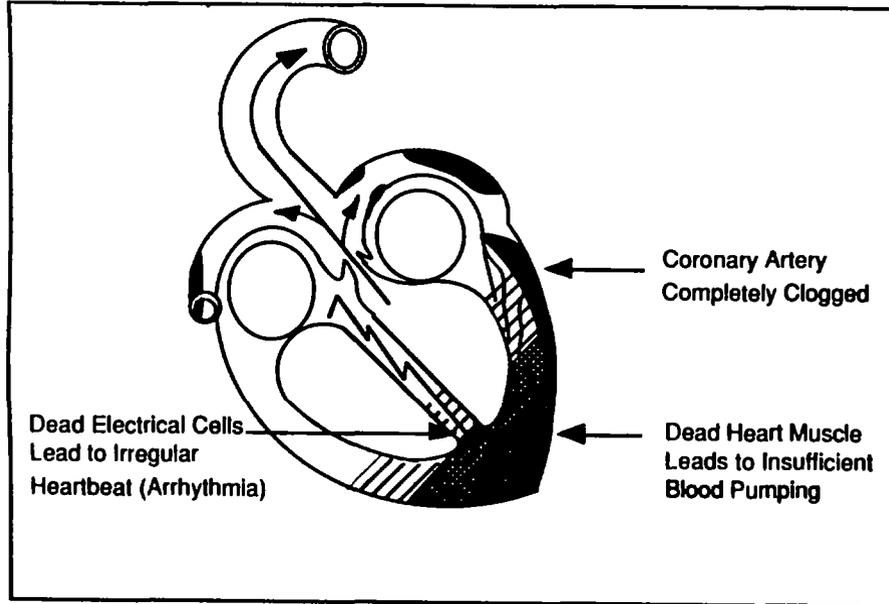
- Heart attacks, strokes and other cardiovascular diseases are primarily caused by vitamin deficiencies.
- Optimum supplementation with vitamins and other essential nutrients is the basic therapeutic measure for prevention and successful treatment of cardiovascular diseases.
- I encourage my colleagues in clinical medicine to help spread this information as soon as possible for the benefit of your own patients and millions of others.

A special note is in order for patients with coronary heart disease or other forms of cardiovascular diseases:

- You should start immediately to supplement your diet with vitamins and other essential nutrients.
- While following the recommendations of this book, do not discontinue your regular medication without consulting your doctor.
- Share your health improvements with your doctor. Together you can make the best decisions to reduce your regular medication.



## WHAT ARE THE CONSEQUENCES OF A HEART ATTACK

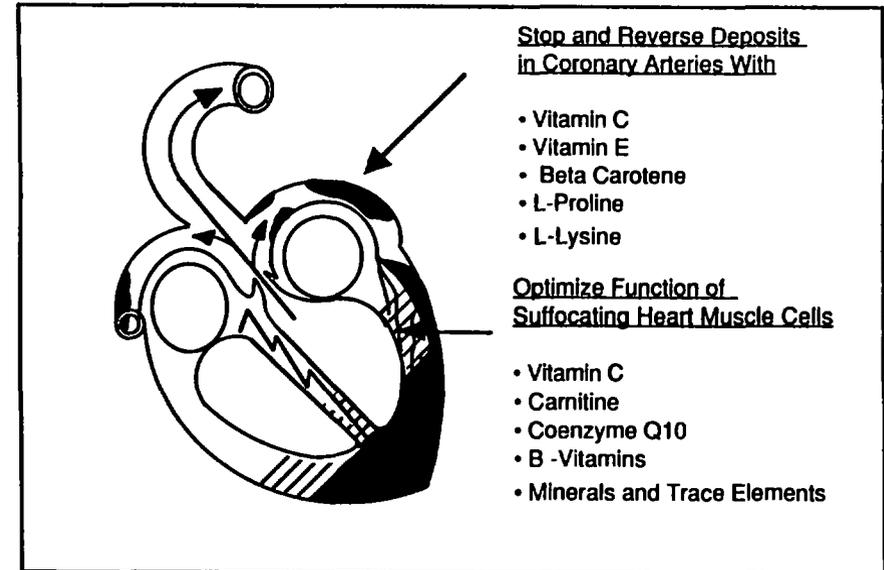


In previous sections we have seen how atherosclerotic deposits in coronary arteries reduce the blood flow in these arteries, thereby causing the heart muscle to suffocate. A heart attack is caused by complete clogging of a coronary artery and by the total cut-off of millions of heart muscle cells from oxygen and nutrition. Two severe consequences result from a heart attack.

- If the heart muscle cells are cut off from the blood circulation for several hours they die off. As a result, a certain portion of the heart muscle becomes defunct. A heart muscle of which 25% is destroyed by a heart attack is like a four cylinder motor running on three cylinders.
- In a similar way, the electrical cells of the heart can be affected by a heart attack, resulting in their death or severe irritation and leading to irregular heart beat (arrhythmia). Severe electrical irritation (fibrillation of the heart chamber) and other grave forms of arrhythmia are the most frequent causes of death after a heart attack.

The larger the size of the dead heart muscle, the greater the impairment of blood pumping, the greater the risk for arrhythmias and the less likelihood of surviving a heart attack.

## HOW TO IMPROVE THE QUALITY OF LIFE AFTER A HEART ATTACK

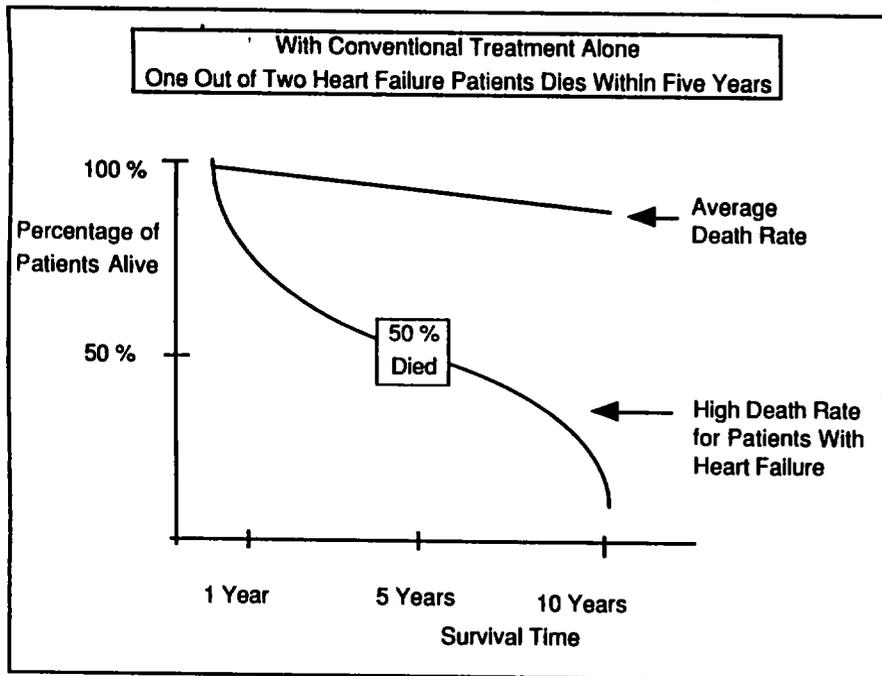


Anybody suffering a heart attack should immediately contact a hospital and get emergency care. The sooner you obtain the proper medical attention, the greater the chances of limiting lasting damage to your heart muscle cells. Every minute counts. If a heart attack has occurred some time ago, you should continue to consult regularly with your physician. In addition, this page will give you valuable information about how to improve the quality of your life after a heart attack.

It is important to understand that once a heart attack has led to the death of heart muscle cells, these cells seldom regenerate. Therefore, the primary aims after a heart attack are the following:

- Halting the further growth of atherosclerotic deposits in the coronary arteries and thereby preventing the reoccurrence of a heart attack. The essential nutrients for achieving this aim are vitamin C, other antioxidant vitamins, as well as the amino acids lysine and proline.
- Optimizing the function of those heart muscle cells which are still alive. The essential nutrients for achieving this aim are carnitine, coenzyme Q10, panthetine, other B vitamins, magnesium, as well as other minerals and trace elements.

## HEART FAILURE PATIENTS HAVE A SHORT LIFE EXPECTANCY



Patients with heart failure have a very unfavorable prognosis:

- One out of two patients dies within the first five years after the heart failure is diagnosed. After ten years only one or two patients out of ten are still alive.
- For many heart failure patients a heart transplant operation remains the only hope.

Both, the epidemic proportion of heart failure (previous page) and the bad prognosis of this disease (this page) are no coincidence. They are the direct result of the fact that vitamin deficiencies are not yet known and understood as the underlying cause of this disease. Consequently, no effective treatment has been available.

Those among my readers who are candidates for a heart transplant operation may be interested to read the testimonial of a former heart transplant candidate (G.P.) who started to follow my cardiovascular recommendations. By refilling his suffocating heart cells with vitamins and other essential nutrients his heart performance greatly improved. He was able to cancel the scheduled heart transplant operation and he is now leading a normal life.

On the next page we will see that the conventional medical treatment of heart failure leads to a vicious cycle which is responsible for the bad prognosis of this disease.

Further Information: Mc Kee PA 1971.

## THE FATAL CONSEQUENCES OF INCOMPLETE TREATMENT OF HEART FAILURE

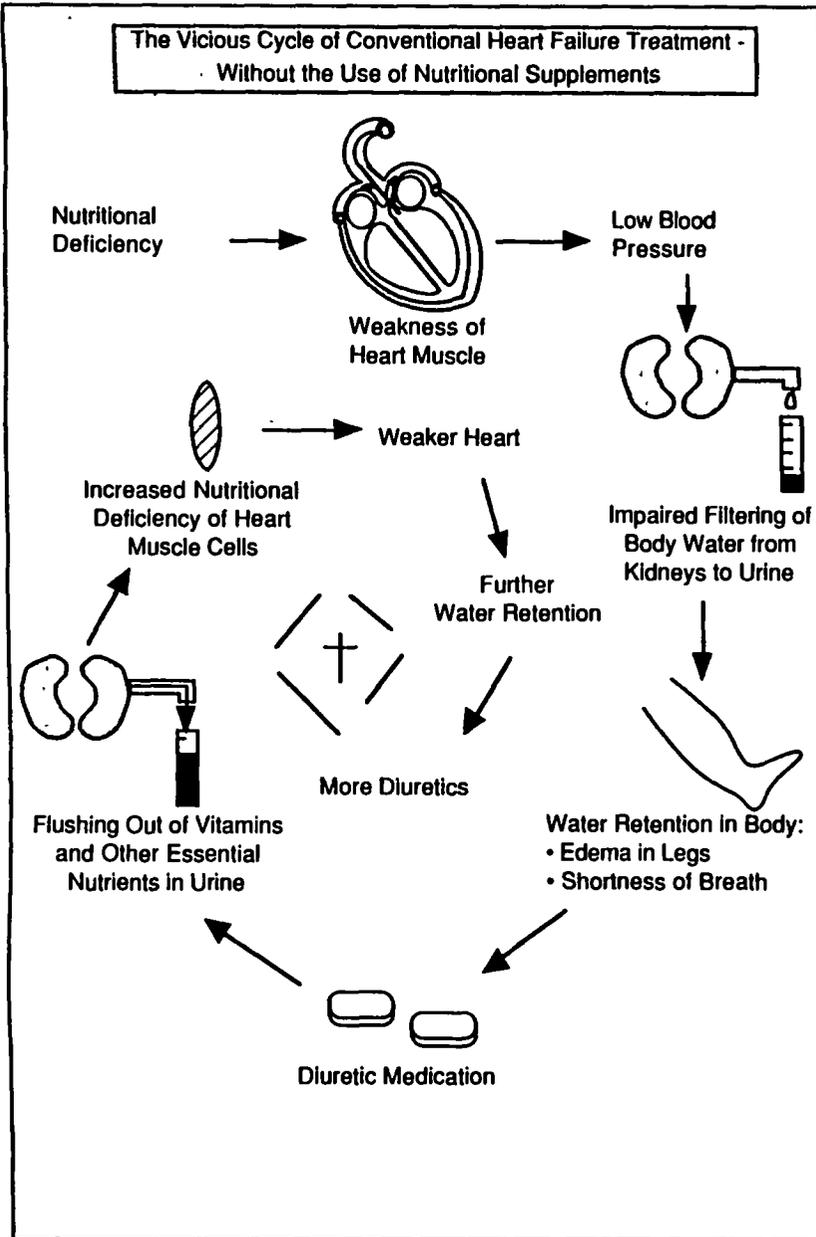
Heart failure leads to water accumulation (edema) in the legs, lungs, and other parts of the body. To remove accumulated water from the body heart failure patients have to take diuretic drugs. At this point of the treatment the patient enters a vicious cycle which is explained in the adjacent figure. The understanding of this vicious cycle is a clue to the successful treatment of heart failure disease in the future.

Nutritional deficiencies of the heart muscle cells lead to a weak pumping of the heart. The low blood output into the arteries results in low blood pressure, which has direct consequences for the proper function of the kidneys. The primary role of the kidneys is to filter body water into urine. With low blood pressure, less water is filtered out and, instead of leaving the body via urine, it accumulates in the legs and other parts of the body. As a result, edema occur in the feet and legs as well as in the lungs, where it leads to shortness of breath and eventually, to lung edema.

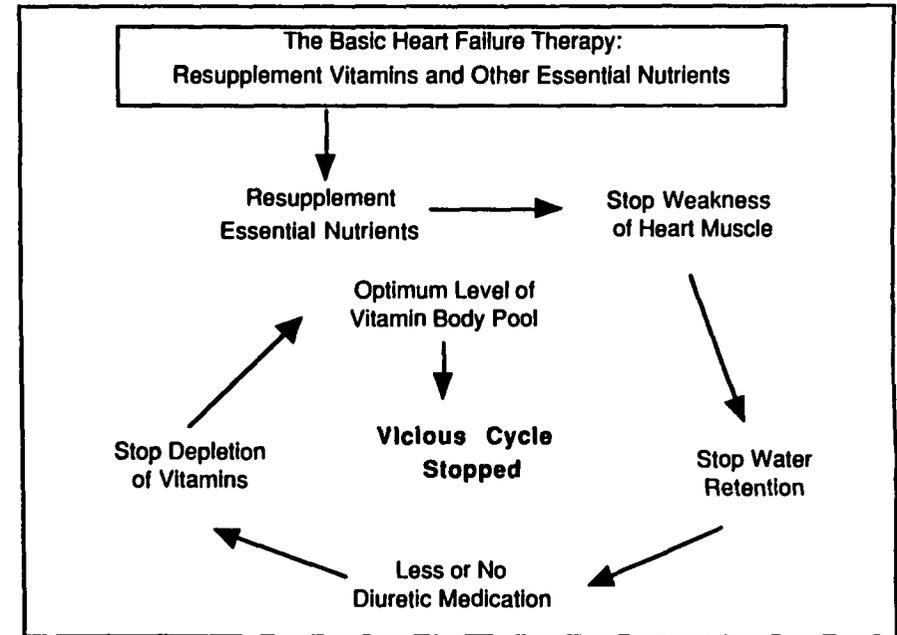
In order to eliminate the abundant body water and to provide relief to the patient diuretic medication is given. On one side, this medication increases the filter function of the kidneys and flushes out the body water into the urine. Unfortunately, diuretic drugs also flush out the small vitamins and other essential nutrients into the urine. The body's loss of essential nutrients further aggravates the lack of fuel nutrients for the heart muscle cells, hereby further aggravating the heart failure. A vicious cycle begins.

A weakened heart leads to even more water accumulation in the body. Higher dosages of diuretic medication is required, further depleting the body of essential nutrients and further weakening the heart. We suddenly understand why heart failure has such a poor prognosis and why there is no other alternative for many patients than to receive a new heart - or to die before a suitable donor heart can be found.

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## HOW VITAMINS CAN INTERRUPT THE VICIOUS CYCLE OF HEART FAILURE



With this page I am addressing my colleagues in clinical medicine:

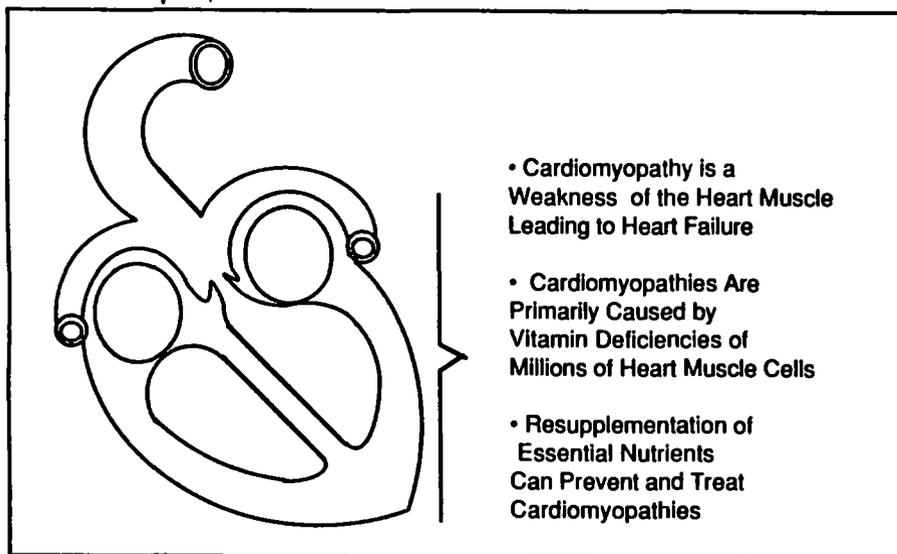
In the attempt to help our patients we have learned to prescribe diuretic medication. While improving the immediate problems for the patient, the water accumulation in the body, diuretic medication depletes the patient's body of water soluble vitamins and thereby starts a vicious cycle. While diuretic medication may still be needed in severe cases, no one should prescribe diuretic drugs any longer without alerting the patients to resupplement their bodies with vitamins and essential nutrients.

Patients and doctors should be equally interested in interrupting the vicious cycle of heart failure with an optimum supplementation of vitamins and other essential nutrients in the diet. Most important among these essential nutrients are:

- Vitamin C
- Carnitine
- Coenzyme Q10
- B vitamins
- Minerals and trace elements

The following pages will highlight some of the clinical evidence for the importance of essential vitamins and nutrients in the treatment of heart failure.

## CARDIOMYOPATHIES ARE PRIMARILY CAUSED BY VITAMIN DEFICIENCY

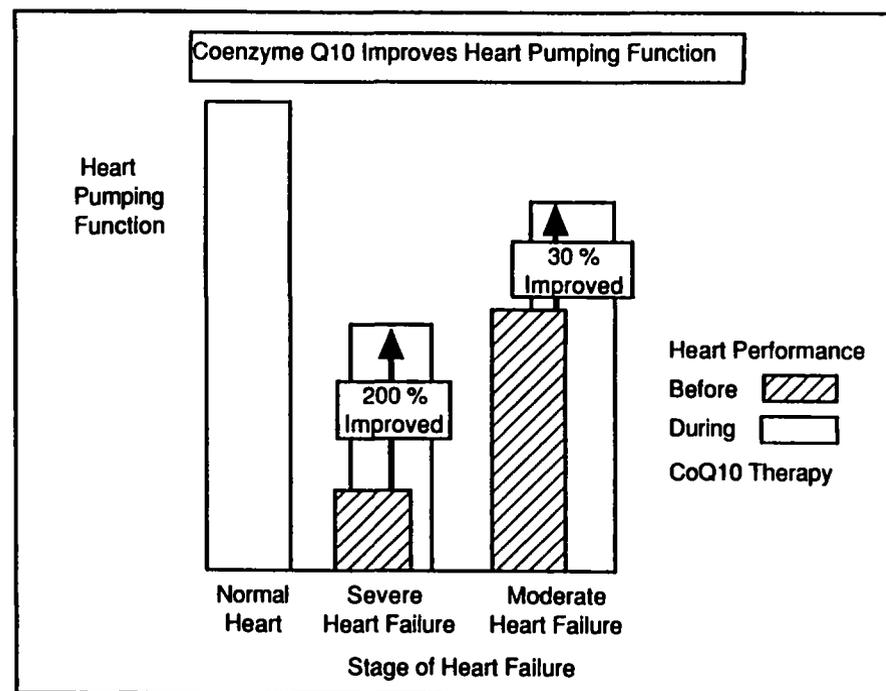


The best documented form of heart failure in which vitamins and other essential nutrients were proven to be most effective are cardiomyopathies. What are cardiomyopathies? The Latin word cardiomyopathy means 'disease of the heart muscle'. The unique feature of this form of heart failure is that it occurs frequently without any other heart condition being present. This fact makes cardiomyopathy an ideal disease to identify the underlying problem of heart failure in general and to document an effective treatment for this disease.

According to the current medical textbooks the causes for cardiomyopathy are still largely unknown. However, during recent years scientific evidence showed that cardiomyopathy is primarily a vitamin deficiency disease. Dr. Karl Folkers and his colleagues from the University of Austin, Texas, are pioneers of cardiomyopathy research and nutrition. They have shown that coenzyme Q10 (ubiquinon), an important cell fuel nutrient, greatly improved the health of cardiomyopathy patients. Dr. Folkers recently reviewed the available clinical studies of coenzyme Q10. This review included 25 Japanese clinical reports from 110 physicians in 41 medical institutions. The summary of ten years of clinical research showed that an average of 70% of the patients with cardiomyopathy and heart failure benefited from a dietary supplementation of coenzyme Q10.

Further Information: Folkers K 1985; Mortensen SA 1990.

## COENZYME Q10 BENEFITS PATIENTS WITH HEART FAILURE



Coenzyme Q10 (ubiquinon), is a critical fuel for the functioning of the miniature power plants or bioenergy centers in each cell of our body. It is essential for the proper 'breathing' of our cells. Coenzyme Q10 was found to be much lower in the blood and in the heart muscle of patients with heart disease compared to healthy persons.

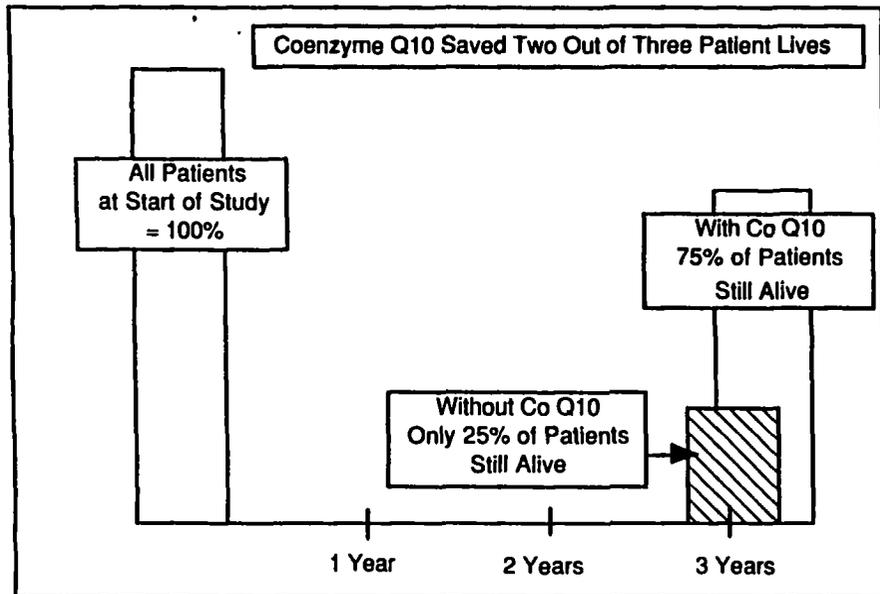
The figure above summarizes the results from a study by Dr. Langsjoen, Dr. Folkers and their colleagues. They gave 100 mg of coenzyme Q10 per day to 88 patients with heart failure. In this study more than 75% of these patients showed a significant improvement in the pumping function of their heart as well as their overall well being.

The following improvements were observed after few weeks of taking coenzyme Q10:

- Patients with very severe forms of heart failure benefited the most from coenzyme Q10 supplementation. The pumping function of these patients increased more than 200% while taking coenzyme Q10.
- In general, the more severe the heart failure condition in a patient, the greater was the benefit from taking coenzyme Q10.
- Coenzyme Q10 had no side effects.

Further Information: Langesjoen PH 1988; Mortensen SA 1990.

## COENZYME Q10 PROLONGS THE LIFE OF PATIENTS WITH HEART FAILURE



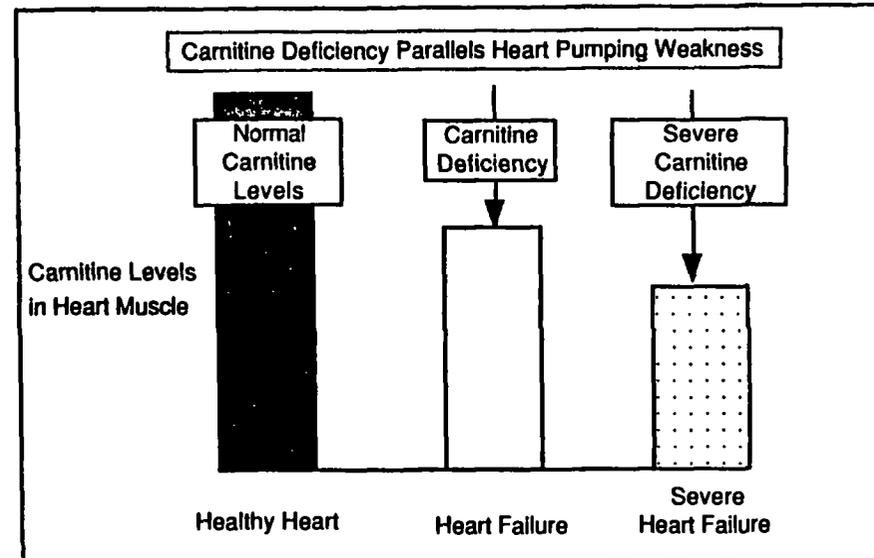
More recently the same group of doctors published the long-term results of their studies with coenzyme Q10 in heart failure patients. By now they had followed 137 patients with heart failure over a period of three years. The reported health benefits from coenzyme Q10 are very encouraging:

- After three years, *three out of four* heart failure patients taking coenzyme Q10 were still alive.
- In contrast, when heart failure patients received only conventional drugs only *one out of four* patients was still alive after three years.

Thus, the life of every second patient with heart failure could be saved by the simple measure of supplementing the diet with coenzyme Q10. Moreover, the dramatic improvement of the survival rate and the quality of life of the patients shows that a lack of coenzyme Q10 in the heart muscle cells is an important cause for heart failure. These scientists conclude that coenzyme Q10 constitutes the first therapy that significantly improves the survival rate of patients with heart failure.

Further Information: Langsjoen PH 1990.

## LESS CARNITINE IN THE HEART MUSCLE CELLS- MORE SEVERE HEART FAILURE



Another important nutrient which is frequently deficient in heart failure patients is carnitine, a natural amino acid. Its main role is to improve the energy level of the cell by transporting energy molecules (fatty acids) to the power plants of each cell. Carnitine also removes useless fuel from the power plants inside each cell (waste removal) and thereby helps to improve their function.

Low levels of carnitine lead to an impaired function of the cellular power plants and consequently to a low energy level in the heart muscle. An important study was carried out by my colleagues at the German Heart Center in Berlin. They measured carnitine in small pieces of heart muscle routinely taken from heart failure patients for diagnostic purposes. The following significant findings were made in this study:

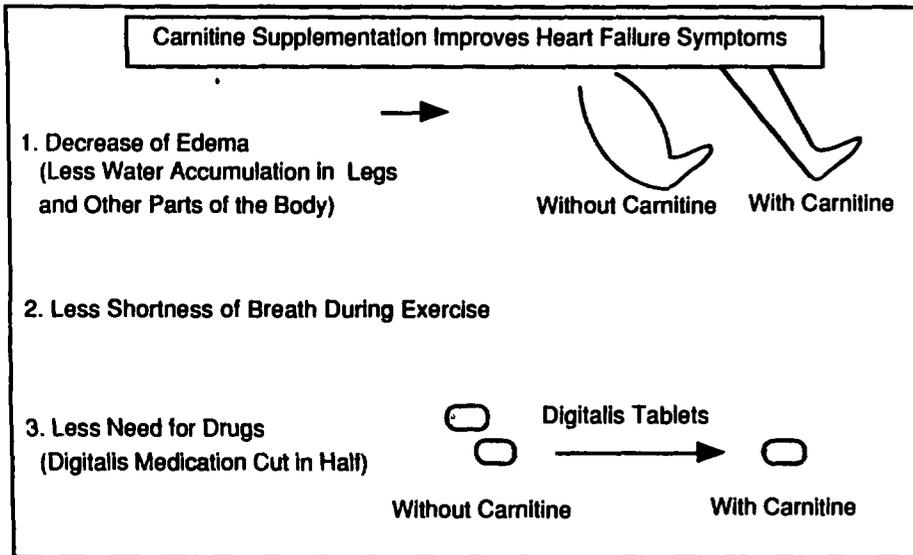
- The highest levels of carnitine were found in the heart muscle cells of healthy hearts.
- The weaker the heart function of the patient, the lower the amount of carnitine measured in the heart muscle cells.

Thus, carnitine deficiency was found to be closely related to the degree of severity of heart failure.

Further Information: Regitz V 1990.

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## CARNITINE BENEFITS HEART FAILURE PATIENTS



Since carnitine deficiency is obviously an important factor for the development of heart failure, it is no surprise that dietary carnitine supplementation greatly benefits patients with heart failure.

Dr. Ghidini and his colleagues from Verona, Italy, conducted a study with 38 patients, all of whom were suffering from heart failure. The physicians gave two grams of L-carnitine to half of the patients for 40 to 45 days and compared the performance of their heart to the other half of the patient group, who did not receive carnitine. All patients continued their conventional therapy, including digitalis medication. The patients receiving additional carnitine showed remarkable improvement of their heart function. Patients receiving carnitine had:

- Less water accumulation in their bodies (less edema)
- An increased natural water excretion from their bodies
- Less shortness of breath
- A normalized heart beat rate.
- Taking carnitine was safe and no side effects were observed.

As a consequence of these remarkable improvements, the patients could cut their conventional drugs (digitalis) in half. The physicians noted that L-carnitine treatment also reduced the blood levels of cholesterol and triglycerides in the patients' blood.

Further Information: Ghidini O 1988.

## TESTIMONIALS FROM PATIENTS WITH HEART FAILURE WHO ARE FOLLOWING MY CARDIOVASCULAR HEALTH RECOMMENDATIONS

Dear Dr. Rath:

I am happy to report that your cardiovascular health recommendations have improved my life! Now I can climb the stairs readily and without shortness of breath. I can also resume hiking for 3-4 miles a day without feeling tired and exhausted. I do have an energetic outlook towards life, and I am sure it's due to your recommendations.

Thank you very much for all the research you have done and are continuing to do for people with circulatory problems.

Yours truly,

A.G., USA

Dear Dr. Rath:

I am 64 years old and for four years have been suffering from heart failure, arrhythmia, and shortness of breath. I had difficulty in climbing stairs, and while walking I had to pause frequently. I have been following your cardiovascular health recommendations for the past two weeks and I notice remarkable changes: I can climb stairs without any problems. I can now walk one mile or more, even uphill. Before, I had to pause after about 200 yards. I have more energy for living.

Because of my health improvements my physician showed interest in your recommendations for cardiovascular health.

G.W., Germany

## DAILY NUTRITIONAL RECOMMENDATIONS FOR OPTIMUM CARDIOVASCULAR HEALTH

- The following amounts of vitamins and other essential nutrients are my daily recommendation for an adult person to maintain optimum cardiovascular health. The health improvements documented in this book were achieved with these moderate amounts.
- Patients with severe heart conditions may double this amount. For these patients I also recommend an extra daily dose of 5-10 grams (1-2 teaspoons) of Vitamin C. Please inform your doctor about the nutritional supplements you are taking.
- For adolescents I recommend half the amounts shown below as a daily supplement.

### VITAMINS

Vitamin C	1000 mg
Vitamin E	600 I.U.
Vitamin A (Beta Carotene)	8000 I.U.
Vitamin D	600 I.U.
Vitamin B-1	40 mg
Vitamin B-2	40 mg
Vitamin B-3 (Niacin)	50 mg
Vitamin B-3 (Niacinamide)	150 mg
Vitamin B-5 (Pantothenate)	200 mg
Vitamin B-6	50 mg
Vitamin B-12	0.1 mg
Folic Acid	0.4 mg
Biotin	0.3 mg

### MINERALS

Calcium	150 mg
Magnesium	200 mg
Potassium	99 mg
Zinc	30 mg
Manganese	6 mg
Copper	2 mg
Selenium	0.1 mg
Chromium	0.05 mg
Molybdenum	0.02 mg

### OTHER IMPORTANT NUTRIENTS

L-Proline	500 mg
L-Lysine	500 mg
L-Carnitine	150 mg
Coenzyme Q10	25 mg

## HOW YOU CAN GET MORE INFORMATION

- If you have difficulties finding the nutrients recommended in this book elsewhere **HEALTH NOW** can refer you to sources.
- If you or your doctor have difficulties identifying a laboratory that does the lipoprotein(a) testing **HEALTH NOW** can refer you to diagnostic laboratories performing this test.
- You can also order additional copies of this book directly through **HEALTH NOW**.
- Dr. Rath founded **HEALTH NOW** to promote nutritional medicine through scientific research and through educational services.
- Parts of the revenues from the sales of this book are designated for further clinical studies with nutritional supplements in the fight against heart disease, strokes, diabetes and other diseases.

HEALTH NOW, 387 Ivy Street, San Francisco,  
California 94102, USA  
Tel: 1-800-624-2442 or 916-939-1007 (from overseas).