



## Hypothesis on the Nature of Embolic Cerebral Strokes

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### Goals

The main problems: what is the mechanism of atherosclerosis and emboli development?

In the past 30 years, two main methods of preventing cerebral stroke through surgery on the internal carotid artery have emerged in medicine: endarterectomy and / or carotid artery stenting. These two methods of removing plaques and expanding the arterial bed are now considered the most promising for the prevention of cerebral ischemia.

### Method

Studying information on the Internet, participating in conferences.

### Results

Somewhat earlier, to the question of the cause of atherosclerosis, the New Theory of CVD gave an answer [1, 2]. atherosclerosis is mainly promoted by imperceptible loss of arterial blood volume in humans. The optimal volume of arterial blood in a healthy person is approximately 15% in relation to the total volume of blood in the blood vessels of a person. This is facilitated by gravity in a sedentary lifestyle. In addition, due to physical or psychological stress, with an increase in blood pressure in a person, the vessels connecting the arterial and venous channels can open. These vessels include large and small arteriovenous anastomoses (AVA), they can be called emergency valves in the vascular system [3, 4].

In a healthy person, constant leaks of arterial blood are compensated by additional pumping of blood through the pulmonary circulation, i.e. through the pulmonary vessels. With the modern lifestyle, with physical inactivity, in the elderly, it is difficult to compensate for losses. Deficiency of arterial blood leads to a forced decrease in the volume of the arterial bed: a forced spasm of all arteries sets in. Both volumes: both the volume of arterial blood and the internal volume of the arterial bed cannot be unequal. These are two complementary values, at any second they must be equal.

But since arterial vessels are elastic, with prolonged compression (spasm) of the vessels, mechanical stresses and deformation in the form of compression or stretching occur inside the walls of the arteries, depending on the layer (adventitia, media,

epithelium). As a result, malnutrition (ischemia) of micro "vessels of vessels" occurs in the walls of blood vessels. A natural reaction to prolonged spasms: necrosis and fibrosis of the walls. The reduced diameters of all arteries are gradually fixed, and in some places, with a seriously damaged inner layer (epithelium), plaques are formed. Spasm is a natural process from the point of view of physics and hydromechanics: it cannot be otherwise in elastic healthy vessels membranes. Calcium and cholesterol are simply building materials blocks to anchor the reduced diameter of the arteries. Conclusion: the consumption of fatty foods is not the cause of atherosclerosis, eat for health, natural fat and meat, but not more than the norm.

The same conclusion follows from medical examinations of the health of people who suffered hardships and hunger in besieged Leningrad [5]. It turned out that almost all of them developed atherosclerosis of the arteries, although they could not be suspected of consuming fatty foods. The health of this cohort of people only with renewed vigor confirms the New Theory of CVD. It was the constant stress and poor nutrition that led to spasms of the arteries, the consolidation of their reduced diameters, and to severe atherosclerosis! In the opposite direction, atherosclerosis will not go, because fibrosis is formed almost forever. Conclusion: correct prevention should consist in the regular movement of excess venous blood back into the arteries. This can only be done by exercise or loads, with the help of breathing practices, or the periodic transfusions of venous blood in the artery proposed by the author.

So, we figured out the nature of atherosclerosis. yes, that is leakage of arterial blood. Yes, it is the narrowing of large and small arteries that leads to cerebral ischemia and strokes. Causes: either from excessive spasm and lack of nutrition in any part of the brain, or from blood clots and microthrombi generated by plaques or vessels located upstream.

Modern medical practice shows that advanced methods: endarterectomy and stenting of the carotid arteries are far from a panacea [6]. About 20% of patients experience relapses within a year: the appearance of neurological symptoms and / or restenosis of the same artery or any adjacent one. This is directly indicated by the New Theory of CVD: arterial blood leaks lead to spasm of arteries throughout the body, but it

primarily affects the arteries in the upper half of the body, perhaps, or even preferable, next to old stents. This is because the gravity force of the Earth constantly acts on the columns of both arterial and venous blood, therefore, it is in the upper parts of these columns that some negative pressure is created. And it is in the cerebral micro arteries located in the upper part of the brain that these pressure decreases are greatest, both from the side of the arteries and from the side of the veins. It is this phenomenon that leads to cerebral ischemia due to natural vasospasm and atherosclerosis.

As regards the nature of strokes, one question remained uncovered: why in many cases does a person form numerous air emboli?

Here is what official medicine says [7]. risk factors for the development of microembolism (statistically allocated) are the person's age, the presence of coronary heart disease, arterial hypertension, the presence of atherosclerosis, stenosis and some other factors. That's right!

But what can the New CVD Theory say additionally on this issue?

Let's consider this problem only from the point of view of physics: specifically statics. We are not considering the dynamics yet. This conditional separation is acceptable.

Emboli appear, apparently, because cerebral arterioles and venules are equally susceptible to additional negative pressure. It depends on the length of the blood columns along the vertical line (when sitting or standing, but not lying down). Thus, a critical blood deficit is created between arterioles and venules, in this case, the brain cells are not supplied with food. Two columns of blood "act to break" the blood flow in the precapillaries in different (opposite) directions. It is there (near certain groups of brain cells) that the conditions for the maximum rarefaction dose are created, the conditions for equalizing the blood pressure near zero mm Hg or even lower. In this case, the blood flow tends to rupture. This is how lacunar strokes can form. This is how air bubbles appear near the cells! (Recall the causes of decompression sickness due to a drop in pressure.) There comes a point when these bubbles block the nutrition of a group of brain cells. The patient develops neurological symptoms: loss of visual fields, speech impairment, memory loss, etc.

This condition is called embolic stroke.

Author's advice: when you feel (or for preventive purposes) that you may experience cerebral ischemia or transient ischemic attack, then make a series of sharp short exhalations (say 6-10 exhalations during five seconds). Fix the emphasis on exhalation, while sharply and synchronously lift the diaphragm up and squeeze your stomach. Then pause for 5-15 seconds and repeat the series. And so several times. This can be done unnoticed by others right in the office. Each series of breathing exercises will take about 2 minutes. Ischemia will not occur. Such exercises can be repeated 5-10 times during the better afternoon, especially if you are working at a computer or sit still for a long time. Why does the effect occur? Yes, because the waves of excess blood pressure will be directed upward: to the neck and brain. These waves through the vessels will reach the arterioles, venules and capillaries of the brain. Zones with

extreme negative pressure near the cells will not be created, flow ruptures will be prevented, and the number of emboli will probably decrease.

### Conclusions

Dear leaders of healthcare and medicine! Dear Academicians and Professors! Dear cardiologists and neurologists! I ask, finally, to read this theory and draw conclusions for yourself and for your supposedly science of MEDICINE. Already 9 years have passed since the development of the New CVD Theory. About 40 articles have been published in Russian and English. Either criticize this theory, or admit it according to your internal rules. Just don't be silent.

And do not be offended that the New CVD Theory was created and promoted by a physicist, not a physician.

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