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## WHAT EFFECT DO VITAMINS HAVE ON HUMAN HEALTH (ANALYSIS)?

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The discovery of vitamins is associated with the name of N. I. Lunin, who in 1880 defended his dissertation «On the importance of inorganic salts for animal nutrition».

No one has ever proven that vitamin C is useful for colds. In addition, vitamin C destroys the more valuable and rare vitamin B<sub>12</sub> (cobalamin) and contributes to the formation of «stones» in the kidneys. Of course, vitamin C is very useful, for example, for the Prevention of scurvy (but only in combination with other vitamins). In general, the idea that scurvy occurs in the absence of ascorbic acid in food has long been outdated. To prevent and treat this beriberi, it is necessary to introduce two vitamins into the body – C and P. A daily «preventive» dose of vitamin C will provide you with insomnia, headaches and other painful manifestations, such as bladder stones. In 2000, at a conference of the American Heart Association, a group of American Scientists made a statement that vitamin C in preventive doses contributes to the development of atherosclerosis (mainly in the carotid artery).

Most vitamin supplements are synthesized from coal tar and other oil derivatives. Although they are chemically identical to natural vitamins, their biological activity is much lower. Synthetic vitamins cannot perform all the functions inherent in natural vitamins. Therefore, we will figure out for ourselves what these vitamins (catalysts of biochemical processes) actually are.

Healthy people have been given vitamin pills for many years, and unexpected news has emerged: almost always vitamins obtained in doses higher than those in the normal human diet are useless, and sometimes even harmful. The first doubts about the usefulness of vitamins (vitamin preparations) arose in 1984. In that now distant year, Finnish scientists examined 29 thousand smokers who received vitamin E, beta-carotene or placebo. 8 years after the start of the experiment, suspicions of the harmful effects of vitamins on the body were scientifically confirmed: those who took vitamins did not get less cancer. Moreover, in the group that took beta-carotene, the number of people suffering from lung cancer increased, and among those who took vitamin E, the number of strokes increased dramatically. This result did not

change anything for Soviet (now Russian) doctors, who believed and still believe that vitamins A and E prevent the formation of malignant tumors and vascular diseases. In the summer of 2003, the English medical journal «Lancet» published an article by cardiologist Mark Penn, who summed up the results of 15 such experiments with vitamin E and beta-carotene. In 82 thousand participants, additional doses of vitamin E did not reduce the likelihood of atherosclerosis, heart attack or stroke and did not increase life expectancy. Beta-carotene, from which vitamin A is obtained in the body, which was used on 140 thousand healthy people, even slightly increased their mortality. Penn even stopped experimenting with beta-carotene just in case. Scientists from the University of Southern California (USA): high doses of vitamin C lead to thickening of the walls of the cerebral artery. With regard to cancer, the situation is even worse. Back in the mid-90s of the XX century, the first information appeared that beta-carotene increases the risk of lung cancer in smokers. A joint Serbian-Danish-American study of 170 thousand people, recently published, was supposed to find out whether taking vitamins A, C and E protects against digestive cancer? It turned out that taking these vitamins slightly, but definitely increases the risk of such tumors, and the combination of vitamin A and beta-carotene is especially dangerous. It increases the risk of bowel cancer by as much as 30 percent. Researchers estimate that out of a million people who swallow large amounts of such vitamin supplements, about 9,000 die from digestive cancer every year.

Many biologists and doctors, however, do not believe that vitamin supplements can be useless or even harmful. Because other large-scale studies show that people who consume a lot of vegetables and fruits have a lot of vitamins and antioxidants in their blood, and such people are less likely to suffer from heart disease and cancer. Perhaps the point here is not only in the content of vitamins in plants. It should be borne in mind that plant food contains about ten thousand other substances balanced by nature itself. Maybe the theory that strokes, heart attacks, and tumors are caused by active radicals is generally wrong? This assumption was made by the English immunologist Tony Segal. He believes that free radicals are not the cause, but a byproduct of some other chemical reactions that damage the cell. In addition, it would be wrong to strive for the complete destruction of free radicals in the body: white blood cells use them to protect against infections. And vitamins can be expected to fight free radicals; vitamins play a much more important role, participating in biochemical reactions as catalysts. All vitamins serve as catalysts for biochemical processes. This means that when there is an excess of vitamins in the body, normal biochemistry is disrupted, reactions accelerate, and then the aging of the entire body accelerates. It is possible that the science of vitamins will return to its origins: you need to take vitamin supplements only if for some reason your diet is poor and monotonous. Vitamin C should be obtained by sailors on a voyage and polar explorers for wintering, B vitamins - those who eat mainly polished rice, vitamin A – those who do not eat carrots, eggs, butter, do not drink milk.

Medical experts at the University of Washington conducted clinical studies among 78 thousand people aged 50-76 years and recorded the paradoxical effect of additional multivitamins, vitamin C, E and folate. These supplements were

completely ineffective in fighting lung tumors. Moreover, after analyzing factors such as smoking and hereditary factors, it was concluded that additional vitamin E intake led to a significant increase in the risk of lung cancer. The study showed that when you increased your daily intake of vitamin E by 100 mg, the risk of lung cancer increased by 7%. Those patients who took 400 mg of the vitamin daily had a 28% increased risk of developing lung cancer over 10 years. In addition, experts emphasize that vitamins and «dietary supplements» do not help prevent diseases such as cancer. Vitamins in foods are essential nutrients that undoubtedly support health and serve as a prevention of vitamin deficiency. However, they are not a means of protection against such chronic diseases as cancer. Another group of cancer scientists at the University of California, San Diego claims that there is scientific evidence to reduce the risk of lung tumors when eating vegetables high in carotenoids, such as carrots and green peas.

In 2006, several scientists (employees of the University of Oregon) concluded that dietary supplements containing vitamin C help restore normal levels of vitamin E in the body, which is one of the components of the protective mechanism that protects the lungs from harmful substances contained in tobacco smoke. Vitamin E was thought to play a central role in protecting the lungs from free radicals found in tobacco smoke. Although vitamin E turns into a toxic form when interacting with nicotine, the researchers believed that maintaining normal levels of vitamin C contributes to the rapid return of the toxic form of vitamin E to normal. While with a lack of vitamin C, such recovery, according to scientists, does not occur. A report on this study was published in the journal *Free Radical Biology and Medicine*.

Now it is clear in medicine that vitamin E is ineffective for people suffering from cancer: it does not cure or stop the progression of the disease. Scientists have long considered outdated recommendations for adding vitamin E to prevent cancer. Professor Christian Gloud, head of the study at Copenhagen University Hospital, said: «the main conclusion of our review is that disease prevention with beta-carotene, vitamins A and e cannot be recommended. These antioxidant supplements are highly likely to increase the risk of premature death». According to Professor Gloud, most reports are silent about the causes of death of patients taking vitamin supplements, but «... in all likelihood, they died from what people usually die of: maybe it was fleeting atherosclerosis, or maybe it was cancer». «Antioxidant vitamin supplements have been tested repeatedly in clinics, but there has been no evidence that they have any effect on human health,» Gloud told *The Associated Press*.

In recent years, the medical literature has often written that antioxidants can block the adverse effects of free radicals on the arteries and cells that are harmful to the heart and cause the development of certain types of cancer. However, now some researchers believe that antioxidants work satisfactorily only if they enter the body with regular food. Hence the «unique» conclusion: people who consume vitamin – rich foods are healthier just because they take better care of themselves. However, it should be borne in mind that beta-carotene has been shown to increase the risk of lung cancer in smokers.

Even the most «sophisticated» vitamin complexes and dietary supplements will not make you healthy at best, and at worst they can deprive you of your health and shorten your life.

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## БИОМЕХАНІЧНІ АСПЕКТИ ГНУЧКОСТІ ТА МЕТОДИКА ЇЇ ВИМІРЮВАННЯ

Юлія Безпалько

**Актуальність дослідження.** Під гнучкістю розуміють морфо-функціональні властивості опорно-рухового апарату людини, які визначають ступінь рухливості його ланок. На відміну від основних рухових здібностей, які є безпосередніми факторами моторних дій, гнучкість є найсприятливішим фактором для необхідного розташування ланок для виконання рухів.

**Мета дослідження** – обґрунтувати біомеханічні аспекти гнучкості та дослідити методику її вимірювання.

**Матеріали і методи дослідження:** *теоретичні* – аналіз даних літературних джерел у розрізі вивченої проблеми; *систематизація даних* наукової літератури; *емпіричні* – спостереження, бесіди; *інструментальні* – антропометричні виміри.

**Результати дослідження.** Гнучкістю називається здатність виконувати рухи з великою амплітудою. Зміна кутів руху в окремих суглобах називається гоніометрією, а прилад гоніометром. Гнучкість залежить від ряду показників: температури оточуючого середовища (підвищення температури викликає підвищення гнучкості), часу доби (в середині дня вона вища), правильності розминки та інше.

Виділяють активну і пасивну гнучкість. Активна гнучкість – це здатність виконувати рухи в будь-якому суглобі з великою амплітудою за рахунок активності м'язових груп, які проходять через цей суглоб.

Пасивна гнучкість – визначається найвищою амплітудою, яку можна досягнути за рахунок зовнішніх сил. Різниця між цими двома видами гнучкості називається дефіцитом активної гнучкості. Гнучкість залежить від ряду показників: температури, ефективності розминки, часу доби та інше.

За способом прояву гнучкість підрозділяють на динамічну і статичну. Динамічна гнучкість виявляється в рухах, а статична – в позах.

Виділяють також загальну і спеціальну гнучкість. Загальна гнучкість характеризується високою рухливістю (амплітудою рухів) у всіх суглобах (плечовому, ліктьовому, гомілковостопному, хребта і ін.); спеціальна гнучкість – амплітудою рухів, відповідній техніці конкретної рухової дії.

Прояв гнучкості залежить від ряду чинників. Головний чинник, що обумовлює рухливість суглобів – анатомічний. Обмежувачами рухів є кістки. Форма кісток багато в чому визначає напрям і розмах рухів в суглобі (згинання, розгинання, відведення, приведення, супінація, пронація, обертання).