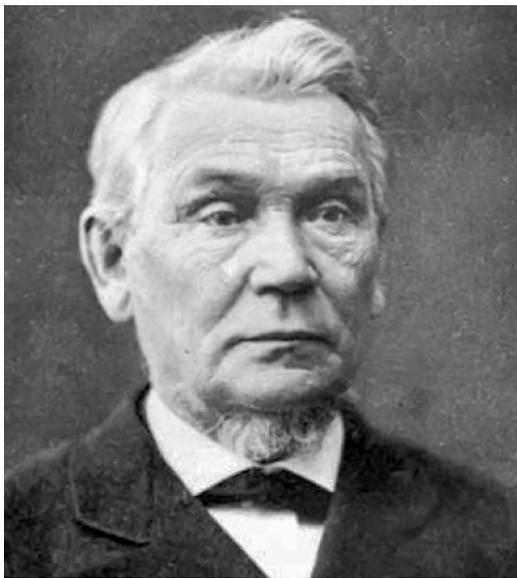


Professor Volodymyr Opanasovych Karavaiev — surgeon, scientist and innovator

The article presents the professional and scientific path of Professor Volodymyr Opanasovych Karavaiev — the first professor of surgery, first head of the department, first organizer and first dean of the medical faculty of St. Volodymyr University, who worked at the university clinic (now Kyiv City Clinical Hospital No18).

Surgery is the first and leads us to the truth, so we hope that the passage of time will not take it with us

M.I. Pirogov



For many, the life and work of our predecessors became a measure of their own actions and their own lives, an example of dedication to their profession and science.

Volodymyr Opanasovych Karavaiev became the first professor of surgery, the first head of the Department of Surgery, the initiator and the first dean of the Medical Faculty of St. Volodymyr University. He combined not only organizational and managerial qualities, but also, above all, the talent of a scientist, an experimenter, an innovator, and a doctor.

In 1838, under the direction of M. I. Pirogov, V. O. Karavaiev completed a world-renowned experimental clinical study «On Traumatic Inflammation of Veins» («*De phlebitide traumatica*») devoted to the investigation of causes and mechanisms of purulent complications (pyemia, hospital gangrene). In this scientific work, V. O. Karavaiev made an assumption that did not comply with the scientific views, concepts and ideas of that time. The provision that pus passes through the pulmonary capillaries became a surgical axiom in the

treatment of sepsis not so long ago, in spite of the fact that V. O. Karavaiev noted it more than 180 years ago, before Rudolf Virchow began his research on thrombosis and embolism.

The work on the pericardial puncture «On the protocol of the pericardial sac» is particularly noteworthy. V. O. Karavaiev described the surgical techniques for this procedure and their indications, practically implemented many innovative ideas that were groundbreaking in the field of heart surgery. V. O. Karavaiev was the first surgeon to carry out pericardial puncture (access by V. O. Karavaiev) providing its experimental justification.

The era of anesthesia began in 1845. On October 16, 1846, a Boston dentist, Thomas Morton, under the advice of a chemist, Carl Jackson, first used etheric anesthesia. V. O. Karavaiev and A. P. Walter, an anatomist, studied the mechanism of action of ether, and then chloroform, as well as the physiological basis of anesthesia. And importantly, this was the first set of scientific studies that were widely used in national and world medicine. Similarly to M. I. Pirogov V. O. Karavaiev first tried ether on himself, then on volunteers, and only after receiving successful results included patients into the study. It should be noted that V. O. Karavaiev did not observe any fatal complications of anesthesia in his practice. M. I. Pirogov was the only scientist in the world who registered such cases.

V. O. Karavaiev wrote the most accurate and detailed works on the physiological issues of anesthesia and its action. He was the first in the Russian Empire to identify indications and contraindications for the use of inhalation and rectal ether anesthesia, described the stages of anesthesia, and without being familiar with the Charrier apparatus for inhaling ether vapors, designed a device for its use.

V. O. Karavaiev carried out many significant researches in ophthalmology. Thus, in 1841 he was the first in the world, 25 years before Trefe (1865), to use an autopsy of the cornea in its upper part to treat cataracts, proving the feasibility of this procedure in more than 1.5 thousand observations. Out of 897 personally performed cataract surgeries, V. O. Karavaiev achieved good results in 856 patients. Due to V. O. Karavaiev's method, cataract surgery took a few seconds. He developed the technique of tenotomy to eliminate strabismus and was the first to perform this operation. He also invented the original eye instruments: a bayonet catarrhal knife, special tweezers for fixing the eyeball. V. O. Karavaiev was one of the first to teach ophthalmology by combining theory with practice. He is the author of prominent works on certain issues in ophthalmology — «On operations for the formation of an artificial pupil and strabismus» (1842), «On cataracts in practical and surgical terms» (1859) and others.

In the field of facial plastic surgery, V. O. Karavaiev developed several methods of plastic repair of nasal defects, described the original method of straightening of the back of the nose (1838), as well as introduced a suturing technique for hard and soft palate reconstruction that was further used by domestic surgeons (1840). V. O. Karavaiev performed 1215 operations (mortality rate — 3.2%) on the face, of which 326 were plastic operations.

V. O. Karavaiev was the first to implement a method of amputation of limbs with the formation of skin and skin-muscle flaps with reduced muscle weight to prevent suppuration in the pre-antiseptic period, and widely introduced it into surgical practice. He was one of the first to use subchondral resection, showing that the periosteum is the tissue from which bone tissue is further regenerated. V. O. Karavaiev performed a number of such operations in 1839.

V. O. Karavaiev described the results of his scientific work on rare diseases in «Surgical cases of disease», which was published in Germany in 1843. It should be noted that due to the publications in France and Germany and invitations to the German medical congresses, V. O. Karavaiev became a well-known scientist in Europe.

V. O. Karavaiev participated in the development and implementation of two of the most significant concepts that form the basis of modern world surgery — anesthesia and antiseptics.

V. O. Karavaiev had been using Lister's antiseptic method of treatment («Lister's bandage») in his clinic since 1870, much earlier than surgeons in the European countries (1872). The information about this fact can be found in the «letters of mourning» or today known as case histories. V. O. Karavaiev observed

the negative properties of carbolic acid in general, but still began to use it immediately: surgical instruments were washed with a 3% solution of carbolic acid, and it was used for air disinfection in the operating room. This antiseptic agent significantly increased the success rate of surgical interventions in the clinic.

V. O. Karavaiev suggested an original, and at that time, a radical method for the treatment of rectal prolapse, which in efficiency and simplicity was much better than the methods developed by Diefenbach, Dupuytren and Rust. The work «On the radical cure of prolapse of the anus (prolapsusani)» was published in the journal «Friend of Health» in 1842 N 17, p. 132–134.

Back in the 1870s, V. O. Karavaiev was one of the first to perform skull trepanations. In total, he performed 56 operations indicated for the treatment of skull injuries, inflammatory diseases and tumors.

On March 2, 1863, V. O. Karavaiev became one of the first surgeons in Europe, who successfully performed a resection of the gangrenous bowel resulting from the hernia with a primary anastomosis in the pre-antiseptic period. The surgical treatment of strangulated hernias marked the beginning of the development of this type of surgery not only in the Russian Empire but also in Europe.

V. O. Karavaiev was one of the first surgeons in the world to perform ovariectomy, which was an extremely rare procedure at that time. The operation of ovariectomy was generally condemned in France, Germany and England, where it was not performed at all. He was one of the first to dare to perform ovariectomy. On October 5 (September 23), 1864, the first ovariectomy was carried out by Yu. K. Szymanowski in Kyiv, but the patient developed peritonitis and died on the 6th day of the postoperative period. On February 25, 1865, V. O. Karavaiev performed a similar operation on a 46-year-old patient with a large ovarian cyst. A 24-kilogram cyst led to respiratory and cardiovascular failure. The patient developed peritonitis and died on the 3rd day after surgery. But, after a thorough analysis of this operation, Karavaiev invented a special knife that allowed reducing the operation time and management of the pedicle torsion of the ovarian cyst outside the abdominal cavity. The surgeons used this tool in similar operations.

V. O. Karavaiev and his followers laid foundations for the statistical approach that takes into consideration particular aspects and conditions of work and service arrangement in the surgical clinic. It became the basis for the development of modern evidence-based medicine. Objective reports on surgical activities and their in-depth analysis were made only by the best representatives of the world surgery, including V. O. Karavaiev and his teacher M. I. Pirogov.

From November 1, 1844 to May, 1887, V. O. Karavaiev completed a titanic scientific study, the provisions of which were reported in his work «Surgical Faculty Clinic» that was compiled by Dr. Kutsevol-Artemovskiy and later became an integral part of the activities of any clinic or surgical department.

V. O. Karavaiev had encyclopedic knowledge and analytical thinking that resulted in a large number of reviews written by him, published in the scientific journals and kept in the archives. Today, the following provisions of his reviews attract the attention of the world scientific community: firstly, a reviewer's substantial knowledge of the state of the problem and a concept of the peer-reviewed work; secondly, the ability to analyze and give an objective review, to express comments in a polite, delicate and friendly way. Reviews should be presented not as basic and boring reports but as reasonable and useful recommendations and conclusions.

«Operative Surgery (lectures by Professor V. O. Karavaiev)» (1858) was included into the golden fund of domestic medical science and education as it served as a guide for many generations of domestic physicians. In addition to this manual, V. O. Karavaiev compiled the «Atlas of Operative Surgery». Given the artistic presentation of the material, its clarity and comprehensibility, accuracy and completeness, the atlas was unparalleled, as evidenced by the fact that lectures on operative surgery were republished three times: in 1858, 1861, 1873.

All the achievements of national and world surgery were incorporated in this work. V. O. Karavaiev was the first scientist who described the

relation of practical surgery to physiology and pathological anatomy.

V. O. Karavaiev was an invaluable member of the medical community. He became an Honorary member of the Universities in Kyiv and Kazan. V. O. Karavaiev was a member of the Russian Surgical Society named after M. I. Pirogov, the medical societies located in Kyiv, Kharkiv, Odesa, Kherson, Arkhangel'sk, Vilnius, Vyatka, Ekaterinoslav, the Caucasus, Kamyanets-Podil'sky, and Chisinau.

V. O. Karavaiev was highly respected far beyond Ukraine. His achievements were of the utmost importance for national surgery, so he gained recognition and authority from his contemporaries.

Volodymyr Opanasovych Karavaiev was one of the founders of the national medical science as well as an initiator of the scientific surgical school. Based on the numerous data from the literature, there is a reason to believe that such world-famous scientists as M. M. Volkovich, K. M. Sapezhko, O. S. Yatsenko, I. F. Saboneev, O. T. Bogaevsky, and Ya. V. Zilberberg were his students. Many of the students and the faculty members, who worked with V. O. Karavaiev, made a significant contribution to the development of national medicine under the supervision of their teacher.

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Висвітлено професійний та науковий шлях професора Володимира Опанасовича Караваєва — першого професора хірургії, першого керівника кафедри факультетської хірургічної клініки, першого організатора і першого декана медичного факультету університету Св. Володимира в місті Києві. Заснував університетську клініку (нині — Київська міська клінічна лікарня № 18).