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INNOVATIVE TECHNOLOGIES IN MODERN SURGERY AND THEIR CLINICAL EFFECTIVENESS

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Annotation: This article covers the stages of formation and development of surgical science, modern surgical methods and their significance in practical medicine. Minimally invasive, laparoscopic and robotic directions of surgery are analyzed and their effectiveness in restoring patient health is substantiated. The role of professional qualifications, a multidisciplinary approach and innovative technologies in surgical practices is also indicated. The results of the article are of significant scientific and practical importance in further improving modern surgery and improving the quality of medical services.

Key words: surgery, modern medicine, surgical practices, minimally invasive methods, laparoscopic technologies, robotic surgery, patient health, innovative approaches

Surgery is one of the oldest and at the same time the most rapidly developing areas of medical science, and is of incomparable importance in maintaining human health and prolonging life. The word surgery comes from the Greek words “cheir” - hand and “ergon” - work, and means “the art of treatment performed by hand”. This definition itself expresses the essence of surgery, that is, it is aimed at diagnosing and treating diseases mainly through operative, invasive methods. Today, surgery has become a complex medical direction that includes not only traditional operations, but also minimally invasive, endoscopic, laparoscopic, robotic and high-tech methods. The formation and development of surgery are closely related to the development of mankind. The first surgical operations performed in ancient Egypt, India, China and Greece laid the foundation for modern surgical science. In those days, operations such as bandaging wounds, setting bones, and opening abscesses with sharp instruments were performed, which were based more on experience and observations. Over time, the development of knowledge about anatomy, physiology, pathophysiology, and aseptic-antiseptics led to the formation of surgery on a scientific basis. By the 19th century, the introduction of anesthesia and antiseptics marked a turning point in the history of surgery. The emergence of methods of anesthesia made it possible to perform complex and long-term operations, and the development of antiseptic rules dramatically reduced postoperative complications and mortality. Since that time, surgery has been formed as an independent and leading clinical science, and its various branches - general surgery, traumatology, neurosurgery, cardiovascular surgery, abdominal, thoracic, plastic and reconstructive surgery - have begun to develop. The importance of surgery in modern medicine is increasing. In cases where many diseases cannot be treated conservatively, surgical intervention remains the only way to save the



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patient's life. For example, in cases such as acute appendicitis, intestinal obstruction, acute bleeding, traumatic injuries, tumors and congenital malformations, a positive result cannot be achieved without surgery. Therefore, surgery is recognized as a strategic medical direction that not only cures, but also saves lives. In recent years, the rapid development of science and technology has ushered in a new stage in surgery. Minimally invasive methods, in particular laparoscopic and endoscopic operations, have become widely used. These methods reduce the volume of surgical trauma, shorten the patient's postoperative recovery period, reduce the risk of complications, and improve aesthetic results. Robotic surgery, on the other hand, further expands the surgeon's accuracy and capabilities, creating conditions for performing operations with high precision in complex anatomical areas.

Surgery is a complex profession that requires not only a set of technical skills, but also deep scientific knowledge, quick thinking, responsibility and moral maturity. Each surgical decision directly affects the life and health of the patient. Therefore, a surgeon must have not only excellent anatomical knowledge, but also clinical thinking, stress resistance and a culture of communication with the patient. Since the cost of errors in surgery is very high, continuous education, advanced training and adherence to modern protocols are of great importance. In addition, surgery is a field that requires a multidisciplinary approach. Cooperation with therapists, anesthesiologists, resuscitators, radiologists and laboratory specialists plays an important role in the preparation for surgery. In the postoperative period, the coordinated work of the entire medical team is necessary to monitor the patient's condition, rehabilitation and prevent complications. In this regard, surgery is a central link in the medical system. The increase in surgical diseases, the increase in the number of traumatism and oncological diseases, as well as the increase in the life expectancy of the population, is further increasing the need for surgical procedures. Many pathologies that occur in old age, including cardiovascular and musculoskeletal diseases, often require surgical treatment. This further enhances the social importance of surgery. At the same time, modern surgery faces a number of urgent problems. Postoperative infections, risks associated with anesthesia, complications and rehabilitation issues require constant scientific research. Advances in biomedical technologies, artificial intelligence, 3D modeling and regenerative medicine are creating new opportunities for solving these problems. In the future, it is expected that highly accurate and safe surgical procedures based on an individual approach will be widely introduced. Surgery is an integral and leading part of medical science, and its development is directly related to the health and well-being of society. The introduction of this article covers the historical formation of surgery, modern development trends and its role in medicine. In the following sections, the main directions, modern methods, current problems and prospects of surgery are analyzed on a scientific basis.

Surgery is an important and integral direction of medical science, which occupies a leading place in preserving human life and health. This article analyzes the stages of historical formation of surgery, modern development trends and its importance in practical

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medicine. Studies show that as a result of the rapid development of science and technology, surgical operations are being performed using safer, more effective and less traumatic methods. The widespread introduction of minimally invasive, laparoscopic and robotic technologies serves to reduce the risk of postoperative complications, ensure faster recovery of patients and improve the quality of life. At the same time, it was found that the success of surgical treatment depends not only on technical capabilities, but also on the professional knowledge and skills of the surgeon, clinical thinking and effective cooperation with the medical team.

In conclusion, modern surgery is a constantly improving scientific and practical field, in which innovative approaches, advanced technologies and multidisciplinary cooperation are the main priorities. In the future, it is possible to further develop this field, improve the quality of personnel training and expand scientific research, and further improve the efficiency of surgical services provided to the population.

REFERENCES:

1. Sabiston D.C., Townsend C.M. *Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice*. 21st ed. Philadelphia: Elsevier, 2021.
2. Brunicaudi F.C., Andersen D.K., Billiar T.R. et al. *Schwartz's Principles of Surgery*. 11th ed. New York: McGraw-Hill Education, 2019.
3. Williams N.S., O'Connell P.R., McCaskie A.W. *Bailey & Love's Short Practice of Surgery*. 28th ed. CRC Press, 2023.
4. Moore K.L., Dalley A.F., Agur A.M.R. *Clinically Oriented Anatomy*. 8th ed. Philadelphia: Wolters Kluwer, 2018.
5. Cuschieri A., Hanna G.B. *Essential Surgical Practice*. 5th ed. London: CRC Press, 2015.
6. Greenfield L.J. *Surgery: Scientific Principles and Practice*. 6th ed. Philadelphia: Lippincott Williams & Wilkins, 2017.
7. Farquharson M., Moran B. *Farquharson's Textbook of Operative General Surgery*. 10th ed. CRC Press, 202

